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Tiger Team Assessment of the Sandia National Laboratories, Albuquerque Washington, DC 20585

May 1991

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PREFACE

This report documents the Tiger Team Assessment of Sandia National Laboratories (SNL), Albuquerque, located in Albuquerque, New Mexico. SNL, Albuquerque, is operated by the Sandia Corporation (a wholly owned subsidiary of the American Telephone and Telegraph Company) for the U.S. Department of Energy (DOE). The environmental assessment also included DOE tenant facilities at Ross Aviation, Albuquerque Microelectronics Operation, and the Central Training Academy. The assessment was conducted from April 15 to May 24, 1991, under the auspices of DOE's Office of Special Projects under the Assistant Secretary for Environment, Safety and Health (ES&H).

The assessment was comprehensive, encompassing ES&H disciplines, management, self-assessments, and quality assurance; transportation; and waste management operations. Compliance with applicable Federal, State, and local regulations; applicable DOE Orders; best management practices; and internal SNL, Albuquerque, requirements was assessed. In addition, an evaluation of the adequacy and effectiveness of DOE and SNL, Albuquerque management of ES&H programs was conducted.

The content of the report has been reviewed for factual accuracy by representatives of DOE's Office of the Assistant Secretary for Defense Programs; the Albuquerque Field Office (AL); SNL, Albuquerque; and Federal, State, and local regulatory agencies. The report reflects the factual changes from that review.

The SNL, Albuquerque Tiger Team Assessment is part of a larger, comprehensive DOE Tiger Team Independent Assessment Program planned for DOE facilities. The assessment program is part of a 10-point initiative announced by the Secretary of Energy, Admiral James D. Watkins, USN (Ret.), on June 27, 1989, to conduct independent compliance oversight and management assessments of ES&H programs and waste management information on the compliance status of DOE facilities with regard to ES&H requirements, root causes for noncompliance, adequacy of DOE and contractor ES&H management programs, response actions to address the identified problem areas, and DOE-wide ES&H compliance trends and root causes.

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TABLE OF CONTENTS

	<u>Page</u>
GLOSSARY OF ACRONYMS AND ABBREVIATION	x
EXECUTIVE SUMMARY	ES-1
1.0 INTRODUCTION	1-1
1.1 PURPOSE	1-1
1.2 SCOPE	1-2
1.3 APPROACH	1-2
1.3.1 Pre-Assessment Planning	1-3
1.3.2 Onsite Activities	1-4
1.3.3 Reporting	1-4
1.3.4 Followup	1-6
1.4 SITE AND PROGRAM DESCRIPTION	1-6
2.0 KEY FINDINGS, ROOT CAUSES, AND NOTEWORTHY PRACTICES	2-1
2.1 ENVIRONMENTAL	2-1
2.1.1 Key Findings	2-1
2.1.2 Root Causes	2-1
2.1.3 Noteworthy Practices	2-8
2.2 SAFETY AND HEALTH	2-8
2.2.1 Key Concerns	2-8
2.2.2 Root Causes	2-10
2.2.3 Noteworthy Practices	2-11
2.3 MANAGEMENT	2-12
2.3.1 Key Findings	2-12
2.3.2 Root Causes	2-13
2.3.3 Noteworthy Practices	2-14
3.0 ENVIRONMENTAL ASSESSMENT	3-1
3.1 PURPOSE	3-1
3.2 SCOPE	3-1
3.3 APPROACH	3-1
3.4 ENVIRONMENTAL ASSESSMENT SUMMARY	3-2
3.5 ENVIRONMENTAL FINDINGS	3-3
3.5.1 Air	3-11
3.5.1.1 Overview	3-11
3.5.1.2 Compliance Findings	3-15
3.5.1.3 Best Management Practice Findings	3-37
3.5.2 Surface Water	3-39
3.5.2.1 Overview	3-39
3.5.2.2 Compliance Findings	3-43
3.5.2.3 Best Management Practice Findings	3-53
3.5.3 Groundwater/Soil	3-55
3.5.3.1 Overview	3-55
3.5.3.2 Compliance Findings	3-59
3.5.3.3 Best Management Practice Findings	3-69
3.5.4 Waste Management	3-71
3.5.4.1 Overview	3-71
3.5.4.2 Compliance Findings	3-77

	3.5.4 3 Best Management Practice Findings	3-131
3.5.5	<u>Toxic and Chemical Materials</u>	3-135
	3.5.5.1 Overview	3-135
	3.5.5.2 Compliance Findings	3-139
3.5.6	<u>Quality Assurance</u>	3-143
	3.5.6.1 Overview	3-143
	3.5.6.2 Compliance Findings	3-147
3.5.7	<u>Radiation</u>	3-161
	3.5.7.1 Overview	3-161
	3.5.7.2 Compliance Findings	3-165
3.5.8	<u>Inactive Waste Sites</u>	3-201
	3.5.8.1 Overview	3-201
	3.5.8.2 Compliance Findings	3-205
	3.5.8.3 Best Management Practice Findings	3-209
3.5.9	<u>National Environmental Policy Act</u>	3-219
	3.5.9.1 Overview	3-219
	3.5.9.2 Compliance Findings	3-223
	3.5.9.3 Best Management Practice Findings	3-233
3.6	NOTEWORTHY PRACTICES	3-235
4.0	<u>SAFETY AND HEALTH ASSESSMENT</u>	4-1
4.1	PURPOSE	4-1
4.2	SCOPE	4-1
4.3	APPROACH	4-1
4.4	SAFETY AND HEALTH ASSESSMENT SUMMARY	4-3
4.5	SAFETY AND HEALTH FINDINGS AND CONCERNS	4-7
	4.5.1 <u>Organization and Administration</u>	4-7
	4.5.1.1 Overview	4-7
	4.5.1.2 Findings and Concerns	4-9
	4.5.2 <u>Quality Verification</u>	4-21
	4.5.2.1 Overview	4-21
	4.5.2.2 Findings and Concerns	4-23
	4.5.3 <u>Operations</u>	4-32
	4.5.3.1 Overview	4-32
	4.5.3.2 Findings and Concerns	4-34
	4.5.4 <u>Maintenance</u>	4-47
	4.5.4.1 Overview	4-47
	4.5.4.2 Findings and Concerns	4-49
	4.5.5 <u>Training and Certification</u>	4-63
	4.5.5.1 Overview	4-63
	4.5.5.2 Findings and Concerns	4-65
	4.5.6 <u>Auxiliary Systems</u>	4-70
	4.5.6.1 Overview	4-70
	4.5.6.2 Findings and Concerns	4-72
	4.5.7 <u>Emergency Preparedness</u>	4-81
	4.5.7.1 Overview	4-81
	4.5.7.2 Findings and Concerns	4-83
	4.5.8 <u>Technical Support</u>	4-91
	4.5.8.1 Overview	4-91
	4.5.8.2 Findings and Concerns	4-93
	4.5.9 <u>Packaging and Transportation</u>	4-96
	4.5.9.1 Overview	4-96
	4.5.9.2 Findings and Concerns	4-98
	4.5.10 <u>Nuclear Criticality Safety</u>	4-105

	4.5.10.1 Overview	4-105
	4.5.10.2 Findings and Concerns	4-107
4.5.11	<u>Security/Safety Interface</u>	4-114
	4.5.11.1 Overview	4-114
	4.5.11.2 Findings and Concerns	4-116
4.5.12	<u>Experimental Activities</u>	4-123
	4.5.12.1 Overview	4-123
	4.5.12.2 Findings and Concerns	4-124
4.5.13	<u>Site/Facility Safety Review</u>	4-129
	4.5.13.1 Overview	4-129
	4.5.13.2 Findings and Concerns	4-131
4.5.14	<u>Radiological Protection</u>	4-135
	4.5.14.1 Overview	4-135
	4.5.14.2 Findings and Concerns	4-138
4.5.15	<u>Worker Safety and Health Compliance</u>	4-157
	4.5.15.1 Overview	4-157
	4.5.15.2 Findings and Concerns	4-162
4.5.16	<u>Industrial Hygiene</u>	4-176
	4.5.16.1 Overview	4-176
	4.5.16.2 Findings and Concerns	4-178
4.5.17	<u>Occupational Safety</u>	4-187
	4.5.17.1 Overview	4-187
	4.5.17.2 Findings and Concerns	4-189
4.5.18	<u>Fire Protection</u>	4-198
	4.5.18.1 Overview	4-198
	4.5.18.2 Findings and Concerns	4-200
4.5.19	<u>Medical Services</u>	4-207
	4.5.19.1 Overview	4-207
	4.5.19.2 Findings and Concerns	4-209
4.5.20	<u>Explosives Safety</u>	4-215
	4.5.20.1 Overview	4-215
	4.5.20.2 Findings and Concerns	4-217
4.5.21	<u>Firearms Safety</u>	4-223
	4.5.21.1 Overview	4-223
	4.5.21.2 Findings and Concerns	4-226
4.5.22	<u>Firearms Safety</u>	4-236
	4.5.22.1 Overview	4-236
	4.5.22.2 Findings and Concerns	4-237
4.6	NOTEWORTHY PRACTICES	4-244
4.7	SYSTEM FOR CATEGORIZING CONCERNS	4-247
4.8	CATEGORIZATION AND TABULATION OF CONCERNS	4-249
	4.8.1 <u>Categorization of Concerns</u>	4-249
	4.8.2 <u>Tabulation of Concerns</u>	4-255
	4.8.3 <u>Tabulation of Concerns from DOE/EH-0087</u>	4-278
4.9	TEAM COMPOSITION AND AREAS OF RESPONSIBILITY	4-283
5.0	<u>MANAGEMENT ASSESSMENT</u>	5-1
5.1	PURPOSE	5-1
5.2	SCOPE	5-1
5.3	APPROACH	5-1
5.4	MANAGEMENT ASSESSMENT SUMMARY	5-2
5.5	MANAGEMENT FINDINGS	5-3

B.	ENVIRONMENTAL SUBTEAM ASSESSMENT PLAN	B-1
C.	ENVIRONMENTAL SUBTEAM DAILY AGENDAS	C-1
D.	CONTACTS/INTERVIEWS	
	(Attached on microfiche)	
E.	LIST OF DOCUMENTS	
	(Attached on microfiche)	
F.	OSHA NONCOMPLIANCES	
	(Attached on microfiche)	
G.	HOT LINE CALLS	G-1

Glossary of Acronyms and Abbreviations

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABC/AQCB	Albuquerque/Bernalillo County Air Quality Control Board
ACRR	Annular Core Research Reactor
ADM	action description memoranda
AL*	Albuquerque Field Office
ALARA	as low as reasonably achievable
AMO	Albuquerque Microelectronics Operation
ANSI*	American National Standards Institute
ASME*	American Society of Mechanical Engineers
AT&T*	American Telephone and Telegraph Company
BMPF	best management practice finding
BOA	basic ordering agreement
CEARP	Comprehensive Environmental Assessment and Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CF	compliance finding
CFC	Chlorofluorocarbon
CFR*	Code of Federal Regulations
CRADA	Cooperative Research and Development Agreement
CRP	community relations plan
CTA	Central Training Academy
CTC	Coyote Test Complex
CX	Categorical Exclusion
CWDR	Chemical Work Disposal Report
DCGs	Derived Concentration Guides
D&D	Decontamination and Decommissioning
DOE*	U.S. Department of Energy
DP	Office of the Assistant Secretary for Defense Programs or Defense Programs
EA	environmental assessment
EH	Office of the Assistant Secretary for Environment, Safety and Health
EIB/USTR	Environmental Improvement Board, Underground Storage Tank Rules
EIS	Environmental Impact Statement
EM	DOE Office of Environmental Restoration and Waste Management
EMP	Environmental Monitoring Plan
EOC	emergency operations center
EP	engineering procedure
EPA*	Environmental Protection Agency
EPZ	emergency planning zone
ER	Environmental Restoration Department/Site
ERWM	Environmental Restoration and Waste Management
ES&H*	Environment, Safety, and Health
ESHIC	ES&H Improvement and Compliance Program

* Indicates acronyms or abbreviations not defined or spelled out after the first usage in the body of the report.

ESHB	Environment, Safety, Health Compliance Branch
FMOSB	Facility Management and Operational Surety Branch
FY*	fiscal year
GIF	Gamma Irradiation Facility
GPMP	Groundwater Protection Management Program Plan
HEPA	high efficiency particulate air
HERMES	High-Energy Radiation Megavolt Electron Source
HPAR	health physics anomaly reporting
HRS	hazard ranking system
HWMF	Hazardous Waste Management Facility
IEOAT	Independent Explosives Operations Appraisal Teams
INPO	Institute of Nuclear Power Operations
JIT	Just-in-Time
KAFB	Kirtland Air Force Base
KAO*	Kirtland Area Office, U.S. Department of Energy
KCAO	Kansas City Area Office
LDR	land disposal restriction
LMEAT	Line Manager ES&H Action Team
MCL	maximum containment level
MDL	Microelectronics Development Laboratory
MORT	Management Oversight and Risk Tree
MOU	memoranda of understanding
MSDS	material safety data sheet
MTF	memoranda-to-file
NCP	National Contingency Plan
NDT	non-destructive test
NEPA*	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFPA*	National Fire Protection Association
NMED	New Mexico Environment Department
NMSWMR	New Mexico Solid Waste Management Regulation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NQA-1*	Nuclear Quality Assurance Standard One
NRC*	U.S. Nuclear Regulatory Commission
NTS	Nevada Test Site
ODIS	On-Site Discharge Information System
OSA	Office of Safety Appraisals
OSHA*	Occupational Safety and Health Administration/Act
OSP	Office of Special Projects (EH-5)

* Indicates acronyms or abbreviations not defined or spelled out after the first usage in the body of the report.

QA*	Quality Assurance
PBFA	Particle-Beam Fusion Accelerator
PCB	polychlorinated biphenyl
PDS	personnel data sheet
POTW	Publically Owned Treatment Works
PSAP	Personnel Security Assurance Program
PTTSA*	Pre-Tiger Team Self-Assessment
RCRA*	Resource Conservation and Recovery Act
RCSC	Radiological and Criticality Safety Committee
RFS	request for facilities support
RQ	reportable quantity
RQP	requirements, qualifications, performance
S&H	Safety and Health
SABRE	Sandia Advanced Beam Research Experiment
SAR*	safety analysis report
SARA	Superfund Amendment Reauthorization Act
SC	Sandia Corporation
SCIF	Sensitive Compartmented Information Facility
SHEAC	Safety, Health, Environment Appraisal Committee
SIC	Standard Industrial Classification (codes)
SNL*	Sandia National Laboratories
SNM	special nuclear material
SOP	standard operating procedure/safe operating procedure
SPCC	spill prevention control and countermeasures
SPR	Sandia Pulse Reactor
SRCSC	Sandia Radiological and Criticality Safety Committee
SWMU	Solid Waste Management Unit
TEGD	RCRA Ground-Water Monitoring Technical Enforcement Guidance Document
TLC	total life concept
TSA	Technical Safety Appraisal
TSD	treatment, storage, and disposal
TTU	thermal treatment unit
TSDF	treatment, storage, and disposal facilities
UNMH	University of New Mexico Hospital
UOR	unusual occurrence report
UST	underground storage tank
WFO	work for others
WIPP	Waste Isolation Pilot Plant

* Indicates acronyms or abbreviations not defined or spelled out after the first usage in the body of the report.

Executive Summary

EXECUTIVE SUMMARY

This report documents the results of the U.S. Department of Energy's (DOE) Tiger Team Assessment conducted at Sandia National Laboratories (SNL), Albuquerque, New Mexico, between April 15 and May 24, 1991. The assessment was conducted by a team comprised of professionals from DOE, its contractors, and consultants. The purpose of the assessment was to provide the Secretary of Energy with the status of environment, safety, and health (ES&H) programs at the Laboratory.

SNL, Albuquerque, is managed by Sandia Corporation (SC), a wholly owned subsidiary of American Telephone and Telegraph Company (AT&T), for DOE. From its origins as a facility for performing engineering and assembly of nuclear weapons, SNL, Albuquerque, has evolved into a multiprogram laboratory that supports national security with research and development in nuclear weapons, other defense programs, and energy. Its primary mission is to function as an engineering laboratory, pursuing ideas from applied research through development of new weapons and evaluation of their reliability throughout stockpile lifetime.

To continue to be successful, SNL, Albuquerque, must solve ES&H problems as effectively in the future as it has handled weapons- and energy-related problems in the past.

The SNL, Livermore, Tiger Team assessment provided the ES&H "wake up call" for SC management in 1990. It is clear, in retrospect, that this rather sobering report had a major impact on how SC management viewed their responsibilities for ES&H. A series of actions were initiated in the latter half of 1990 that have had a dramatic effect on the overall ES&H culture of SNL, Albuquerque. They include the following:

- A major reorganization was undertaken to better manage ES&H programs.
- Self-assessments have been performed.
- The self-assessment process is being institutionalized.
- Senior research scientists have either volunteered or been reassigned to promote the ES&H cultural change.
- Radio Sandia, "ES&H Update," "Lab News," and "Sandia Line" are being used effectively as communications media to inform Sandians of ES&H issues on a frequent basis.

While significant ES&H issues still exist at SNL, Albuquerque, and their resolution will take a concerted effort by all levels of Sandians in the future, the seeds of excellence have been sown and their cultivation has begun.

If SNL, Albuquerque, carries through with these ES&H initiatives, it has the potential to become the model DOE Laboratory, one that the Secretary of Energy will direct other DOE facilities to study in the search for excellence.

The nature of the findings recorded during this assessment suggest that significant changes have been made by SNL, Albuquerque, since earlier Tiger Team assessments of other contractors managed by the Albuquerque Field Office (AL).

Findings are less global and encompassing at SNL, Albuquerque. The thrust is now generally on implementation rather than recognition.

It is also clear that the ES&H momentum at SNL, Albuquerque, depends as much on the leadership and direction provided by AL as on SNL, Albuquerque, management.

The principal challenge lies with SNL, Albuquerque, management to maintain the motivation and momentum during the long journey ahead.

Summary of Key Findings and Probable Root Causes

Environmental

The Environmental Subteam identified findings of potential noncompliance with Federal and state regulations and DOE Orders, and nonattainment of acceptable best management practices. However, none of these deficiencies present a near term risk to public health or the environment.

The following are environmental key areas of concern: inadequate sitewide programs for the management of waste; lack of formal, approved environmental procedures; inadequate environmental quality assurance; and inadequate identification, monitoring, and control of potential air emission sources.

In characterizing potential root causes, the Environmental Subteam constructed a three-tier system to define the relationship between the findings and root causes. The programmatic nature of many of the findings is such that the findings themselves are often root causes of more specific findings. SNL, Albuquerque, has recognized the weaknesses in its management of environmental protection activities, and has established the ES&H Improvement and Compliance Program as a first step towards its stated goal of environmental excellence.

Safety and Health

The Safety and Health Subteam appraisal of SNL, Albuquerque, revealed that top management, line managers, support staff, and line personnel are making a concerted effort to correct the results of poor past practices in, and attitudes toward, safety and health protection programs. Management's attempts to improve the safety culture are reflected in several intensive efforts, such as the Sandia Workplace Hazards Awareness System, the Management Awareness Notebooks, the "Pre-Tiger Team Self-Assessment Report," and the Self-Assessment Jump Start. These initiatives instilled an increased awareness in safety and health protection for employees. Individual organizational elements, such as the Primary Standards Laboratory, the Mechanical Measurements Section, the Satellite Systems Division, the Safety Components Division, and the Surety Components Division, serve as examples to others in these ES&H initiatives.

Still, many deficiencies were detected in all 21 safety and health technical areas reviewed, and noncompliance with DOE Orders and mandatory standards was noted in all the areas. This situation results from the following circumstances. The new safety and health programs have been largely developed and planned at the upper levels of management. However, delegation of safety and health program responsibilities to lower levels of management has not been adequately defined in formal policy. This has led to inconsistent supervision of workplace safety practices. To eliminate serious workplace hazards, detailed procedures, including clear definition of responsibilities to the working level, are required for the new safety and health programs. Furthermore, these procedures must be followed at the middle management, first line supervisory, and working levels. Finally, more indepth oversight by AL and the Kirtland Area Office is needed to provide assurance that compliance requirements are being followed.

Management

The management key findings at AL and SNL, Albuquerque, were in the following areas: oversight, planning, management systems, and training. The root causes of these findings can be traced to AL's response to the historic priority placed on program performance by Defense Programs; the SNL, Albuquerque, response to program customer demands; and the set of SNL, Albuquerque, values which, while effective in achieving programmatic objectives, is not fully compatible with ES&H requirements. However, the Tiger Team Assessment revealed that both AL and SNL, Albuquerque, have reordered their priorities to emphasize accomplishment of DOE's ES&H initiatives.

Self-Assessments

The Pre-Tiger Team Self-Assessment was a strong and competent initial effort of great value to SNL, Albuquerque, although they recognized that the approach had some shortcomings. Similarly, Jump Start provided a training opportunity in self-assessments for a broad cross-section of SNL, Albuquerque, personnel and provided the catalyst for changes in the ES&H culture. The combination of the best elements of the two efforts will lay the foundation for an institutionalized self-assessment process.

AL developed a Self-Assessment Report that is largely a management review and needs to be expanded to meet the DOE guidance. This institutionalized program is in the formative stage and requires further Office of Defense Programs guidance.

1.0

Introduction

1.0

INTRODUCTION

On June 27, 1989, Secretary of Energy, Admiral James D. Watkins, USN (Retired), announced a 10-point initiative to strengthen environment, safety, and health (ES&H) programs and waste management operations in the Department of Energy (DOE). One of the initiatives involved conducting independent Tiger Team Assessments at DOE operating facilities. The Office of Special Projects in the Office of the Assistant Secretary for Environment, Safety and Health (EH) has the responsibility to conduct Tiger Team Assessments for the Secretary of Energy. This report documents the Tiger Team Assessment of Sandia National Laboratories (SNL), Albuquerque, New Mexico. The environmental assessment (See Section 7.0 of this Report) also included Ross Aviation, the Central Training Academy (CTA), and Albuquerque Microelectronics Operation (AMO). Ross Aviation is a contractor-operated business under DOE contract administered by the Kirtland Area Office (KAO) and a tenant on Kirtland Air Force Base. The CTA is a DOE operation for security training with facilities located adjacent to Manzano Base and in Coyote Canyon. AMO is operated by Allied-Signal Corporation under DOE Contract. Although it is located in SNL, Albuquerque, facilities, it functions independently from SNL, Albuquerque. SNL, Albuquerque, is the twenty-second DOE site to be reviewed by a Tiger Team.

SNL, Albuquerque, is a multiprogram laboratory operated by the Sandia Corporation, a wholly owned subsidiary of the American Telephone and Telegraph Company. The primary mission of SNL, Albuquerque, is to perform system engineering functions for the weaponization of nuclear explosive devices from the conceptualization of new weapons until they are retired from the nuclear weapons inventory. Secondary missions encompass energy research and development, intelligence and verification technology, Department of Defense studies, nuclear safeguards and security, and development of waste minimization and environmental remediation processes involving nuclear materials and weapons production sites.

The management of SNL, Albuquerque, is assigned to the DOE Albuquerque Operations Office (AL). The major DOE program office with programmatic responsibility for SNL, Albuquerque, is the Office of Defense Programs (DP).

1.1

PURPOSE

The purpose of the SNL, Albuquerque, Tiger Team Assessment is to provide the Secretary of Energy with concise information on the:

- current ES&H compliance status at the site and the vulnerabilities associated with that compliance status;
- root causes for noncompliance;
- adequacy of DOE and site contractor ES&H management programs;
- adequacy of response actions needed to address identified problem areas; and
- adequacy of ES&H self-assessments and the institutionalization of the self-assessment process at SNL, Albuquerque, Kirtland Area Office (KAO), and AL.

This information will assist DOE in determining patterns and trends in ES&H compliance and probable root causes, and the effectiveness of the self-assessment process, and it will provide guidance for management to take needed corrective actions.

1.2 SCOPE

The scope of the SNL, Albuquerque, Tiger Team Assessment was comprehensive and included an evaluation of applicable site management systems, facilities, and operations in the context of ES&H. The ES&H areas were reviewed to ascertain the following:

- compliance with applicable Federal, State, and local regulations, requirements, permits, agreements, and enforcement actions;
- compliance with DOE Order requirements for ES&H activities;
- compliance with Occupational Safety and Health Administration/Act (OSHA) regulations and standards as applicable under DOE Orders;
- adequacy of DOE and SNL, Albuquerque, ES&H management programs, including policy and procedures, internal oversight, planning and budgeting, organization, resources, training, and quality assurance;
- conformance with applicable "best" or "accepted industry practices";
- identification of root causes;
- identification of noteworthy practices; and
- adequacy of the self-assessment process to identify, track, and resolve significant ES&H issues.

1.3 APPROACH

The SNL, Albuquerque, Tiger Team Assessment was conducted in accordance with the Tiger Team Guidance Manual (February 1990), applicable DOE Orders and guidance material, and generally accepted audit techniques. The assessment was conducted by a team of specialists from various DOE offices and support contractors. The team was managed by a senior DOE official and three experienced subteam leaders, one for each of the three disciplines of Environment, Safety and Health, and Management. Team members, with their areas of responsibility and work-related experience, are identified in Appendix A.

The Tiger Team Assessment was not an exhaustive review of all facilities and operations at SNL, Albuquerque. Rather, each subteam focused on major facilities and operations to conduct an evaluation that was representative of the overall status of SNL, Albuquerque, ES&H programs. Of the buildings identified as being under the management of SNL, Albuquerque, the most significant, from an ES&H and programmatic standpoint, were reviewed by the Tiger Team.

The Environmental Subteam performed its assessment consistent with the Tiger Team Guidance Manual (February 1990) and the Environmental Audit Manual (January 1990). These documents were used as tools in preparing for the assessment and were supplemented with current regulations, regulatory guidance documents, and references applicable to identifying best management practices. The objective was to assess the site's current environmental compliance status with regard to Federal, State and local regulations, DOE Orders, agreements and consent decrees, and applicable permits. The environmental assessment examined site performance against best or accepted industry practices, and evaluated the adequacy of DOE and contractor environmental program management and resources.

The Safety and Health Subteam, which conducted a separate Technical Safety Appraisal under the leadership of an experienced team leader, reviewed major facilities operated by SNL, Albuquerque, using Technical Safety Appraisal protocols, as delineated in DOE Order 5482.1B and the "Performance Objectives and Criteria for Technical Safety Appraisals at DOE Facility and Sites" (June 1990). Performance objectives utilized for the appraisal making up the safety and health assessment are derived from DOE Orders, Secretary of Energy Notices (SENs), and other policy statements, industry standards, and nuclear industry lessons learned.

The objectives of the Management Subteam were to determine the effectiveness of DOE and contractor ES&H program management and to identify underlying probable root causes for observed weaknesses or deficiencies. The Management Subteam conducted its assessment in accordance with the Office of Special Projects (OSP) recent draft "Management Performance Objectives and Criteria for Tiger Team Assessments." The subteam also used the Tiger Team Guidance Manual (February 1990) as guidance. The subteam coordinated with the Environmental and Safety and Health Subteams to share information and ideas on management issues identified during the course of the Tiger Team Assessment, as well as to identify management issues that were common to the findings of all subteams.

A systematic approach was implemented to perform the probable root cause analyses. This approach began with the analysis and evaluation of detailed background information and assessment data by the individual subteams to develop their findings and concerns. These individual findings were integrated by the subteams through identification of probable causal factors. The last step in the process was a collective determination of a set of probable root causes for the findings and concerns identified.

The Tiger Team Assessment process includes four distinct phases: planning, onsite assessment, report preparation, and corrective action plan review.

1.3.1 Pre-Assessment Planning

Planning for the assessment included the issuance of an introduction and information request memorandum, a pre-assessment site visit, an initial review of the requested documentation provided to the Tiger Team by SNL, Albuquerque, and development of an assessment agenda.

The pre-assessment site visit was conducted by the Tiger Team Leader, the Environmental, Safety and Health, and Management Subteam Leaders, and representatives from the EH Office of Special Projects and the DP Program Office.

The Manager, AL, and SNL, Albuquerque, management provided overviews of site operations and ES&H programs. The Tiger Team Leader and subteam leaders discussed the Tiger Team Assessment program and necessary support requirements for the onsite assessment. Federal, State, and local regulators were invited, as were trade union representatives and leaders of the Isleta Indian Pueblo located in the region.

Representatives of Federal and State agencies, and union representatives participated in the pre-assessment activity.

The assessment approach and agenda were provided to SNL, Albuquerque, prior to initiation of the assessment so that counterparts could be identified for each technical area to be reviewed.

1.3.2 Onsite Activities

Onsite activities for the Assessment took place from April 15 through May 24, 1991. These activities included field observations; document reviews; and observations of routine operations, emergency exercises, and observations about the physical condition of the site and facilities. In addition, reviews were conducted of previous audits and assessments; and interviews were conducted with DOE, contractor, and subcontractor site personnel, as well as personnel from Federal, State, and local regulatory agencies.

Using these sources of information, the Tiger Team developed issues that are reported as either findings (Environmental and Management Subteams), concerns (Safety and Health Subteams), or noteworthy practices. Section 1.3.3 discusses this development process in more detail.

The Tiger Team process was conducted in an open manner with SNL, Albuquerque, and AL personnel to enhance communication and to ensure the accuracy of information and issues. During the process, all three subteams conducted daily debriefing sessions which were open to site personnel. The daily debriefing sessions were well attended, and site personnel actively participated in the sessions. In addition, the Tiger Team Leader held weekly meetings with senior managers from SNL, Albuquerque, and AL to provide a summary overview of the team's progress and to discuss major issues identified by the subteams. Prior to the closeout briefing on May 24, 1991, each subteam provided copies of draft findings and concerns to site personnel and conducted factual accuracy reviews.

1.3.3 Reporting

Section 2.0 is an overall summary of the key tiger Team Assessment findings, concerns, noteworthy practices, and probable root causes identified by the subteams. Sections 3.0 through 5.0 contain the Environmental, Safety and Health, and Management findings and concerns, respectively. Section 6.0 is an evaluation of the AL and SNL, Albuquerque, self-assessment programs. Section

7.0 addresses environmental issues associated with Ross Aviation, Albuquerque Microelectronic Operation and the Central Training Academy, all site tenants.

For the Environmental Subteam, identified issues are categorized as either a compliance finding (CF), best management practice finding (BMPF), or noteworthy practice. Compliance findings are conditions that, in the judgment of the assessment team, may not satisfy applicable ES&H regulations, DOE Orders (including internal DOE memoranda, where referenced), internal ES&H site operating standards, enforcement actions, agreements with regulatory agencies, or permit conditions. Best management practice findings are derived from regulatory agency guidance, draft DOE Orders, accepted industry practices, and professional judgment. Each finding is prefaced by a statement of an applicable performance objective. Performance objectives for compliance findings are derived from promulgated regulations and final DOE Orders, consent orders, agreements, and permit conditions. Performance objectives for best management practice findings are derived from regulatory agency guidance, accepted industry practices, and professional judgment. Findings for the Environmental and Management Subteams are not necessarily arranged in order of relative significance.

The Safety and Health Subteam employed a reporting format that maintains consistency and integrity with the Technical Safety Appraisal process. Each identified issue is developed into a "concern," which is supported by findings, and has the characteristics of being explicit (stating the problem), measurable (auditable), and justifiable. A concern addresses a situation that, in the judgment of the subteam, meets one or more of the following criteria: reflects less than full compliance with a DOE safety and health requirement or mandatory safety standard; threatens to compromise safe operations; or if properly addressed, would substantially enhance the excellence of that particular situation even though that part of the operation was judged to have a currently acceptable margin of safety. Because of this last category addressing the excellence of the operation, more concerns are reported than would result from a strictly compliance-oriented assessment.

The Management Subteam evaluated the effectiveness of management structure, processes, and systems, relative to ES&H programs, to identify findings and develop probable root causes based upon findings and concerns developed by all subteams. The Management Subteam's findings were derived from analysis of key management areas that impact on ES&H activities, and considered DOE policy and Orders, generally accepted management principles, and industry standards. Each finding is supported by a summary and discussion which identifies further detail as to the background, factual basis, and, where appropriate, management implications of the finding.

In addition to identifying findings and concerns, the subteams looked for exceptional practices in accomplishing performance objectives or meeting ES&H objectives. Any noted exceptional practices, which may have general application at other DOE facilities, are identified as noteworthy practices, and are documented for the purpose of information transfer.

The assessment reflects a fixed point in time. Improvements in the ES&H areas that were planned, but were not completed at the time of this assessment, are identified as findings or concerns in the report to provide a complete and accurate picture of the site's conditions from the onset of the assessment.

The Draft Tiger Team Assessment Report was transmitted to the Manager, AL and SNL, Albuquerque, management personnel, DOE Headquarters Program Secretarial Officers, and Federal, State and local regulators, trade union representatives, and leaders of the Isleta Indian Pueblo for technical and factual accuracy review. This final report incorporates the review comments, suggested changes, and modifications.

1.3.4 Followup

AL and SNL, Albuquerque, will prepare a draft action plan that addresses the findings and concerns identified by the Tiger Team Assessment. The draft action plan will be submitted by the Manager, AL, to the Assistant Secretary for Defense Programs, for submission to EH-1 for review and concurrence. The Secretary will approve the final action plan and direct its implementation.

1.4 SITE AND PROGRAM DESCRIPTIONS

SNL, Albuquerque, is a multi-program national laboratory located in Albuquerque, New Mexico, and is operated by the Sandia Corporation for DOE.

1.4.1 Site Description

SNL, Albuquerque, is located at the foot of the Manzano Mountains adjacent to the City of Albuquerque, New Mexico. The SNL, Albuquerque, facilities are about 3 miles south of Interstate 40, and about 7 miles east of downtown Albuquerque (see Figure 1-1). The facilities, owned by DOE, are essentially surrounded by Kirtland Air Force Base (KAFB); and DOE has 1- to 5-year land-use permits for some Air Force property. An area of the Manzano Mountains east of KAFB has been withdrawn from the Forest Service for the exclusive use of the Air Force and DOE.

SNL, Albuquerque, has 547 major buildings, totalling 3.8 million gross square feet. Operations are conducted in six locations, called Tech Areas I, II, III, IV, and V, and Coyote Test Field (see Figure 1-2).

Technical (Tech) Area I is for administration, site support, technical support, component development, research, energy programs, microelectronics, defense programs, and exploratory systems.

Tech Area II was established for the casting and assembly of chemical high-explosive main charges for nuclear weapons, and is now used for testing explosive components.

Tech Area III is devoted to testing and simulating a variety of natural and induced environments. It includes two rocket sled tracks, two centrifuges, and a radiant heat facility.

Tech Area IV is a remote-research location for pulsed power sciences such as X-ray, gamma-ray, and particle-beam fusion and accelerators, all of which are used to simulate nuclear weapon effects and to conduct research on inertial-confinement fusion and particle-beam weapons.

Tech Area V is the remote research area where experimental and engineering nuclear reactors and some particle accelerators are located.

Figure 1-1. SNL, Albuquerque, Location

Figure 1-2. SNL, Albuquerque, Major Operations Areas

The Coyote Test Field contains testing operations requiring large land areas and unusual terrain, with each facility separated from the other by large buffer zones. Facilities in this area include explosively driven shock tubes, aerial cable sites for high-speed impact tests to a ground target, a test site where large amounts of cased conventional explosives can be detonated, numerous small explosive sites, igloos for the storage of explosives, and a laser strain seismometer.

1.4.2 Program Descriptions

SNL, Albuquerque, conducts major mission activities in the following areas.

1.4.2.1 Research, Development, and Engineering Associated with Advancing Nuclear Explosives to Integrated, Functional Weapons for DOD Weapon Delivery Systems

Activities include the evaluation of new weapon concepts, component development, design definition, and systems integration; nuclear weapon surety (safety, use control, command and control, security, and reliability; testing and weapon effects simulation; and production support and stockpile surveillance.

1.4.2.2 Other DOE Defense-Related Programs

This includes development of verification and control technologies to support progress towards arms reduction agreements and to provide intelligence on foreign technologies and weapon systems; and concepts and systems for the safeguarding and security of nuclear materials.

1.4.2.3 Research, Development, and Engineering Technologies for the Safe Storage, Processing, Transport, and Disposal of Hazardous Wastes Resulting from Nuclear Materials and Weapons Production

Includes development of improved manufacturing processes and substitute materials to minimize hazardous by-products; and research, development, and engineering of processes and technologies for remediation and environmental restoration of contaminated nuclear materials and weapons production sites.

1.4.2.4 DOE Energy Research

This includes research and development of concepts for increasing energy efficiency; securing future energy supplies; protecting the environment through applications for ameliorating environmental degradation; and enhancing understanding through educational and public awareness initiatives.

1.4.2.5 Technology Transfer to Enhance Prospects for Rapid Commercialization

1.4.2.6 Work for Others

This work provides access to Sandia's unique facilities, services, and technical expertise and often makes available technologies developed in the nuclear weapons program that are not reasonably available from industry, university, or non-DOE government sources. It is also frequently a means of

facilitating the transfer of appropriate technologies to industry or universities.

Work for others is classified into the following activity groups:

- Nuclear weapons-related
- Safeguards and security
- Verification and control technologies
- Intelligence
- Strategic Defense Initiative
- Space systems
- Advanced military technology
- Radiation-hardened microelectronics
- Particle beam technology
- Nuclear Regulatory Commission
- Environmental protection
- Activities for non-Federal entities

2.0

Key Findings, Root Causes,
and Noteworthy Practices

2.0 KEY FINDINGS, CONCERNS, ROOT CAUSES, AND NOTEWORTHY PRACTICES

2.1 ENVIRONMENTAL

2.1.1 Key Findings

The Environmental Subteam has identified four key findings, each of which is derived from several of the findings in Section 3.5. Although the component findings may not by themselves appear to be significant, taken together they represent those issues of greatest concern. The key findings are as follows:

- The management of hazardous, radioactive, mixed, and solid wastes is inconsistent throughout SNL, Albuquerque, and is generally not sufficiently well-defined or formalized to ensure compliance with DOE Orders or regulatory requirements.
- The conduct of compliant environmental protection activities at SNL, Albuquerque, has been and is continuing to be hindered by a lack of accurate, consistent, formal procedures and the failure to integrate procedures into comprehensive, coordinated environmental programs.
- The application of quality assurance to environmental protection activities at SNL, Albuquerque, is not sufficient to provide assurance that DOE Order and regulatory requirements are being satisfied.
- SNL, Albuquerque, does not have the necessary programs in place to provide accurate identification, monitoring, or control of potential air emission sources.

2.1.2 Root Causes

The approach taken by the Environmental Subteam in the identification of potential root causes is designed to help SNL, Albuquerque, facilitate the development of corrective actions. A root cause is defined as that most basic deficiency that, if corrected, will prevent recurrence of the problem. However, despite the definition, it is possible to identify root causes at multiple levels depending upon the action or problem that one is trying to prevent. As an example, a particular label may be incorrectly completed on a waste container, and the need is simply to correct this particular label. The root cause may be that one step in a procedure is inaccurate. On the other hand, if the labeling issue is considered to be symptomatic of a broader issue, such as the handling of hazardous wastes and the goal is to prevent the mishandling of these materials, then it becomes necessary to identify a higher level or broader root cause, which may ultimately relate to a failure to properly assign authority for environmental protection activities. To select one of the root causes alone could lead to actions that might either fail to address the specific noncompliance, or fail to correct the overall waste management program concerns.

The process of identifying root causes for this assessment is complicated by the nature of the programmatic approach encouraged by DOE for the

conduct of the environmental portion of the assessment. The approach, and consequently many findings, are programmatic; that is, the assessment focuses on the structure and effectiveness of the environmental programs rather than isolated incidences of nonconformance with DOE Orders, regulations, and best management practices. While the findings of nonconformance must be and are included in the report, the programmatic approach results in findings that could themselves be root causes of less global findings.

The Environmental Subteam has chosen to represent the potential root causes as a set of interrelated tiers or levels of root causes. This is being done to better define the relationship between the most significant or highest tier root cause and the finding. This relationship and the development of corrective actions for root causes at each tier are essential for the development of an effective environmental protection program.

The method used by the Environmental Subteam to conduct their root cause analysis was to assemble from the Subteam members, a root cause analysis group to review the findings and identify the first tier root causes, that is, the root causes that are the most directly related to the findings. The next step was to ask why the first tier root causes had occurred. The result of this yielded the second tier root causes. The same question of "why" can be applied at each tier until it is concluded that the "true" or highest level root cause has been identified. For the purposes of this assessment, the Environmental Subteam stopped the process at the point where the root causes developed by the Management Subteam were determined to be the cause of the highest level environmental root causes. The tiers were then represented in a schematic that illustrates their interrelationships. As a final check, the group reviewed the root cause structure to verify that the tiers flow logically from one to another.

Conceptually, there could be an unlimited number of tiers, but on a practical basis, more than three or four tiers below the management root causes is unwieldy: for the SNL, Albuquerque, assessment, three tiers were identified. The potential environmental root causes are presented schematically in Figure 2.1.

Tier 1 Root Causes

At the tier closest to the findings (Tier 1), there are four root causes: procedures, resource allocation, training, and performance measures.

- Procedures

SNL, Albuquerque, has a lack of procedures for the conduct of environmental protection activities and activities that might have an environmental impact. This situation exists both within the ES&H Directorate and the line organizations. The implementation of environmental protection at SNL, Albuquerque, including procedure development, is the responsibility of the line organizations. As a consequence, the use of environmental procedures and the quality of the procedures is inconsistent, as is environmental performance.

Figure 2.1 Environmental Root Causes

Rather than operating from a complete set of well-coordinated, controlled, formal procedures, SNL, Albuquerque, has been relying upon an informal system based on verbal instructions, informal memoranda, and the assumption that individuals have learned the environmental aspects of their jobs through informal on-the-job training and discussions with their peers. This approach has many weaknesses and can lead to environmental protection difficulties as a consequence of misunderstanding the requirements and rapidly changing regulations. A system of well-coordinated formal procedures, including requirements for control and sitewide consistency, can be effective for clearly defining requirements to which individuals must conform. A complete set of accurate procedures can also serve as the basis for developing effective training programs and performance indicators. The need for improved procedures has clearly been recognized at SNL, Albuquerque, and initiatives included in the ES&H Improvement and Compliance Program, such as the Line Managers ES&H Action Team, should aid in resolving this root cause.

- **Resource Allocation**

The Environmental Subteam observed that at SNL, Albuquerque, insufficient resources have been allocated to environmental activities both within the ES&H Directorate and the line directorates. There cannot be effective environmental protection without sufficient resources to conduct the necessary activities. In this context, resources include sufficient levels of staff throughout the organization, with the skills and experience necessary to accomplish their tasks, the provision of adequate facilities, and management ability to identify and prioritize those activities needed to achieve environmental goals. This does not necessarily mean that resources within the organization are inadequate, but rather that they may not be used in the most effective manner.

SNL, Albuquerque, has developed plans to increase staffing levels in the ES&H Directorate, and strengthen ES&H support within the line directorates.

- **Training**

Training in environmental-related activities has not been sufficiently formal or coordinated to ensure that all individuals receive the training necessary for them to understand their roles, responsibilities, and job requirements related to environmental protection. SNL, Albuquerque, is staffed with skilled, motivated individuals who are extremely knowledgeable about the technical aspects of their jobs. However, they are not all environmental professionals. As such, they cannot be expected to be, and generally are not, intimately familiar with environmental regulations and DOE Orders.

There is some formal training in environmental protection, such as that for hazardous waste generators, but there has been no formal sitewide assessment of environmental training needs, nor a formal system to verify that individuals receive the training they require.

The knowledge necessary to manage environmental activities cannot be effectively transferred through informal channels, because this does not provide the type of control that is necessary to ensure that individuals receive an adequate and consistent level of training. If personnel are expected to be cognizant of the environmental implications of their jobs, it is essential that they be provided with not only adequate procedures, but also training.

- **Performance Indicators**

In general, SNL, Albuquerque, has not developed a system of environmental performance measures. An effective system to control environmental protection activities requires that management oversight groups have adequate information to judge whether these activities are being effectively accomplished. This, in turn, requires that a comprehensive set of performance measures be developed and that they be incorporated into a system that provides for their documentation, tracking, trending, and evaluation for use in corrective action development.

The recent formation of the ES&H Regulatory Assessments Division and other actions being taken by SNL, Albuquerque, to establish its self-assessment program will aid in the development of a performance measures systems; however, it is not clear that these activities will address day-to-day measures.

Tier 2 Root Causes

While the first tier root causes are most directly related to the findings, the question that must also be asked is why these factors exist. The Environmental Subteam identified one probable root cause at the second tier: SNL, Albuquerque, has not developed coordinated plans and programs to define, control, and implement key elements of environmental protection.

Plans and Programs. The use of the term "program" has created some confusion among SNL, Albuquerque, and KAO personnel because of a very specific, narrow definition of "Program" presented in SNL, Albuquerque, document "Generic ES&H Standard Operating Procedure, Instruction for Writing ES&H Program Documents" (GN740004). In the context of this discussion, a program is defined as all those systematically planned and executed actions that are necessary to effectively achieve environmental excellence. This includes, but is not limited to, formal policies, plans, standards, implementing procedures, training, oversight, performance measures, tracking systems, corrective action systems, and feedback systems.

Environmental protection is complex. It requires integrating many regulations and DOE Order requirements, and coordinating the activities of the organizational units within SNL, Albuquerque. This can be accomplished only through planning, development, and implementation of detailed, well-considered, structured programs that address the environment-related responsibilities of all operations. The relationship between all corollary plans, programs, procedures, and operations, must be clearly established and well-defined. The

basic precepts and technical details must be communicated to the appropriate personnel through procedures, training, and other means; and a system for tracking performance must be in place to keep management apprised of the effectiveness of programs and the status of conformance to environmental requirements.

SNL, Albuquerque, has not organized its traditional environmental activities into a well-coordinated set of discipline-specific programs. Without a formal, organized approach, environmental protection is difficult to achieve. SNL, Albuquerque, has recognized the weaknesses in its management of environmental protection activities, and has established the ES&H Improvement and Compliance Program (ESHIC). ESHIC consists of a set of interrelated initiatives and activities designed to define, develop, and implement a new ES&H management system.

This program is being developed in accordance with standard quality improvement techniques and implemented through a formal project management system. While this program is still in its infancy and is certain to have difficulties as it is implemented, the concept and the progress that has been made in a short time period is encouraging.

Tier 3 Root Causes

As with Tier 1, there remain underlying causes for the Tier 2 root cause. Three probable root causes were identified at the third tier: there is a lack of organizational and planning skills among SNL, Albuquerque, environmental professionals; these environmental professionals do not have sufficient breadth of environmental technical expertise; and authority, responsibility, and accountability for environmental protection is not adequately defined and understood throughout all levels of SNL, Albuquerque.

- **Organizational Planning Skills**

The design and implementation of environmental programs can be difficult, because there are many regulatory requirements that must be addressed and the wide variety of skills and disciplines that are needed. This requires that individuals responsible for these programs have an understanding of and experience with the techniques that can be used to manage complex, multidisciplinary activities and organizations. Environmental protection activities at SNL, Albuquerque, have not been managed as a part of a sitewide coordinated program. Consequently, the Environmental Subteam is concerned that environmental professionals at SNL, Albuquerque, may not have had the opportunity to develop the level of organizational and planning skills necessary to develop and implement comprehensive environmental programs.

- **Environmental Technical Expertise**

A key to a successful environmental program is the allocation of sufficient environmental technical expertise, within all

organizational units and at all levels. The environmental professionals at SNL, Albuquerque, all appear to be highly skilled in some technical areas, but the breadth of their knowledge is not always appropriate for the wide variety of their responsibilities. This is of particular concern for supervisory personnel within the ES&H Directorate who may not have sufficient understanding of all of their technical areas of responsibility, thus making it difficult for them to provide adequate supervisory oversight. While it is not necessary that supervisory personnel be technical specialists in all areas, some general substantive knowledge is needed.

- **Authority, Responsibility, and Accountability**

The final Tier 3 Root Cause is that authority, responsibility, and accountability for environmental protection is not clearly defined or understood at all levels of the organization. The responsibility for environmental protection is delegated to the line organizations; however, it is not clearly defined how they are held accountable within SNL, Albuquerque, for environmental performance. In addition, it is not clear to what extent any organization within SNL, Albuquerque, has the responsibility to develop environmental programs and standards, or the authority to establish them as sitewide requirements and subsequently enforce adherence to them.

There is one additional factor that has not been identified as a separate root cause, but which contributes to the root causes at all three tiers. This factor is the continued existence within some organizational units by some individuals of an attitude that minimum compliance, i.e., meeting only those requirements explicitly stated in the regulations, is the acceptable standard for environmental protection at SNL, Albuquerque. The Secretary of Energy has stated that full ES&H compliance, meeting both the letter and the spirit of the regulations, is the minimum acceptable standard, and SNL, Albuquerque, upper management (through its policy statements) has clearly indicated that it endorses this concept. As has been the case throughout much of the DOE complex, SNL, Albuquerque, has historically focused on its scientific mission and developed an attitude that environmental protection was secondary. This resulted in the site operating in a reactive mode, and responding to regulatory requirements primarily when instructed to do so by regulators or DOE, and even then providing only the minimum effort necessary to comply. Such an approach is in sharp contrast to the DOE policy of compliance with both the letter and the spirit of environmental regulations and can lead to significant compliance deficiencies.

When one attempts to do the minimum necessary to comply, the interpretation of the regulation is critical; if the interpretation is wrong, compliance may not be achieved. Simply stated, this approach allows no margin for error. A goal of environmental protection that goes beyond the letter of the regulations and addresses the spirit is far more likely to achieve compliance. SNL, Albuquerque, has taken steps to change its ES&H culture and this has clearly had a positive influence. Generally, there is a strong positive attitude toward environmental protection at all levels throughout the organization. Unfortunately, pockets of resistance remain in both the Environmental Programs Department and the line directorates.

Acceptance of minimum compliance is an element inherent in all identified root causes. It will be necessary to remain cognizant of this while attempting to develop corrective actions. If SNL, Albuquerque, is to achieve the goal of having a model environmental program, it is necessary to eliminate this attitude.

Beyond the third tier of the environmental root causes lie those identified by the Management Subteam. The environmental third tier root causes, and the root causes of all three tiers, follow from those identified as management root causes.

While SNL, Albuquerque, does have significant weaknesses in environmental protection, the general problems have been recognized and the ESHIC Program has been designed to address the problems in a structured, organized manner. If the ESHIC Program is successfully implemented, significant improvements in environmental protection should be realized.

2.1.3 Noteworthy Practices

One noteworthy practice was identified by the Environmental Subteam during the assessment: SNL, Albuquerque, has prepared a wall chart and a summary of DOE ES&H Orders to aid in the enhancement of ES&H awareness.

2.2 SAFETY AND HEALTH

2.2.1 Key Concerns

In the 21 technical areas examined by the Safety and Health Subteam, all applicable Performance Objectives were evaluated. In all, 243 concerns were identified in 119 Performance Objectives. There were no concerns in 33 of the Performance Objectives evaluated.

One Category I concern was identified that addressed a worker performing an unsafe machining operation. With part of the machine guarding removed, the operator was bending over and reaching out to apply oil to the cutting edge of the Vertical Turning Lathe in Building 840. This act put the operator's life and safety in immediate peril. The operation of the lathe was stopped immediately, and the machine tagged out until a permanent, corrective action could be taken. Seven Category II concerns were also identified, two in Radiological Protection and five in Worker Safety. These Category II concerns were judged not to present a clear and present danger, but did address a situation that involved a significant risk or substantial noncompliance with DOE Orders. Category I and II concerns require the contractor to prepare an action plan and begin immediate action to correct the problems and identify root causes that contributed to the concerns, prior to the Tiger Team Assessment Report being issued.

The two Category II concerns in Radiological Protection addressed: the potential for the release of contaminated or activated material to the public because of the lack of an effective radiation survey program, and the potential for personnel exposure to radioactive contamination in excess of DOE limits; and the spread of that contamination to other areas, because some contaminated areas were not marked and proper egress surveys were not performed as required. In the Worker Safety area, the Category II concerns addressed: the lack of an effective program for the inspection, testing,

maintenance, repair, and operation of cranes and hoists; the lack of machine guarding throughout SNL, Albuquerque; electrical hazards in several facilities that presented potential imminent danger to employees; hoisting and rigging operations by construction contractor personnel at the Laboratory that presented an imminent danger to personnel; and hoisting and rigging oversight by Laboratory personnel who lacked the training in crane inspection techniques, thus allowing unsafe cranes and hoists to be operated at the Laboratories.

The key concerns identified by the Safety and Health Subteam are:

- **Lack of compliance with DOE Orders and mandatory standards throughout SNL, Albuquerque.** A total of 164 of 242 (68 percent) of the noted safety and health concerns relate to practices or conditions that do not comply with DOE Orders or recognized mandatory standards. A high percentage of the concerns in the following functional safety areas were not in noncompliance with DOE Orders or mandatory standards: Quality Verification, 7 of 10 (70 percent); Operations, 12 of 18 (67 percent); Maintenance, 20 of 22 (91 percent); Packaging and Transportation, 6 of 9 (67 percent); Experimental Activities, 5 of 5 (100 percent); Radiological Protection, 14 of 24 (58 percent); Worker Safety (OSHA), 19 of 19 (100 percent); Industrial Hygiene, 10 of 13 (77 percent); Occupational Safety, 11 of 12 (92 percent); Fire Protection, 10 of 10 (100 percent); and Medical Services, 7 of 8 (88 percent). Considerable effort is required in these areas to assure compliance with applicable requirements or DOE Orders. Several other areas also have a large number of concerns dealing with noncompliance and should receive attention.
- **Absence of an integrated program to protect employees in the workplace.** Deficiencies regarding the following were noted: eye protection, hearing conservation, exposure to chemicals, confined space, respirator protection, carcinogen control, and physical stressors; the use of ladders and scaffolding, and the proper care of aisles, and walkways; the use of unsafe equipment such as cranes, hoists, rigging, and construction fleet vehicles; the use of machinery without proper guarding; and general lack of protection against electrical hazards. There was also a lack of safety and health professional monitoring of the workplace; independent safety oversight, monitoring schedules, and a formalized uniform ergonomics program.
- **Lack of an institutionalized line safety management function and an independent safety oversight organization that reports to management on the status of compliance with DOE Orders and applicable regulations.** A new independent safety oversight organization has been defined in documentation and designated as a specific organizational element. However, resources and detailed plans for implementing this concept were not available at the time of the assessment. The line safety management function was also defined and responsibilities assigned, but

implementation was incomplete. The self-assessments addressed are seminal efforts, but the process is not yet fully institutionalized.

- **Lack of management tools to stimulate and promulgate safety within SNL, Albuquerque.** Individual formal job descriptions, which include safety responsibilities, did not always exist. Personnel performance evaluations have not always included safety as an evaluation element. Measurable safety goals were not consistently set and promulgated to improve the safety posture. Safety meetings were not always regularly held and some were too infrequent. The purpose of safety meetings was not always defined. Management presence in the workplace was not required, and the purpose of walkthroughs of the workplace was not defined. Performance indicators were not plotted, trended, or evaluated as a means of enhancing safety.
- **Lack of defined and implemented safety programs in all safety functional areas.** Organization and administration of safety programs within SNL, Albuquerque, were in a state of flux. Many old programs have been discarded, while new programs have not yet been implemented. In some cases, policy and programs have been defined but not implemented, and many lower tier implementing documents and procedures did not exist. In some cases, lower tier documents were being developed concurrently with upper level documents. Many safety programs were not sufficiently documented or formalized in policy, procedures, and other implementation documents.
- **Lack of operational controls.** Many concerns identified deal with facility logs, configuration control, operating procedures, operator aids, marking of equipment, and lockout/tagout procedures, indicating operational controls were not formalized or uniform across the Laboratory.
- **Lack of a consistent, formal maintenance program that addresses both real and programmatic property.** The maintenance program did not fully encompass corrective, preventative, and predictive maintenance nor cover equipment on a graded basis, as determined by the importance of the equipment to safe operations.

2.2.2 Root Causes

The primary root cause of the concerns noted by the Safety and Health Subteam is lack of formality in ES&H policies, procedures, and implementation.

The assessment's numerous findings revealed lack of formalized and definitive policies; the lack of uniform and consistent interpretation and implementation of established policy; the lack of procedures, or in many cases inadequate procedures; and not following procedures. This root cause stems from the many changes that are currently taking place within the Laboratory in its efforts to adopt a new safety culture. Without

exception, each Subteam member judged that policy (either its absence or inadequacy), to be a prime casual factor of one or more of the concerns in each functional area. Many new policies and procedures had been recently developed, were being developed, or had not yet been developed. Many policies were too new to be fully implemented. In some cases, procedures were being developed concurrently or prior to the development of policy. There is a tendency throughout the Laboratory to delegate authority for policy implementation to a low organizational level without uniform guidance. Thus, uniformity in the implementation of policy did not exist.

Inadequate supervision over ES&H activities was also judged to be a root cause of many of the concerns.

This root cause stems from such factors as lack of forceful supervision in requiring compliance with DOE Orders and prescribed standards and regulations, and misunderstanding of requirements by supervision. Approximately two-thirds of the concerns identified involved noncompliance. This is reflective of a past culture that encouraged only optional compliance with some requirements, such as those for OSHA and Worker Safety. Absence of supervision and oversight by AL was also a contributing factor. Other supervision problems exist because authority to implement safety and health programs is delegated to lower levels of management without defined Laboratory policies that are uniform. Thus, misinterpretation by supervision causes safety problems, varying interpretations, and inconsistencies in how safe operations are achieved.

Insufficient resources, both financial and personnel, was a third root cause of many of the concerns.

There is a considerable lack of qualified and trained staff to support and provide safety overview. Recently, several new organizational elements have been created without sufficient resources to carry out their assigned missions. The new safety culture that SNL, Albuquerque, is striving to achieve requires many more safety professionals and greater financial resources than was required in the past. Safety professionals, in many cases, have not been assigned to the appropriate organizations; or required positions have not been filled. A reallocation of funds for ES&H activities is required until specific additional funding for ES&H corrective actions can be obtained.

2.2.3 Noteworthy Practices

Several candidates were considered for selection as noteworthy practices and two were identified. The first (OA.1) is the conspicuous posting and use of a reference flow diagram listing the applicable regulations from DOE, EPA, Department of Defense, Department of Transportation, Department of Interior, DOE-implemented Federal laws, and state and local legislation and agencies. The second (IH.3) is the development of an emergency shower/eyewash, water flow alarm which provides a reliable and audible notification, especially useful in high hazard or remote locations.

2.3 MANAGEMENT

2.3.1 Key Findings

AL ES&H oversight activities are not adequate to assure that effective, sustainable ES&H programs exist at SNL, Albuquerque. AL's oversight is characterized by informality, limited scope, and the absence of adequate processes to track and measure cost, schedule, and technical performance of the extensive and expanding SNL, Albuquerque, ES&H activities. Although sitewide functional ES&H appraisals are being performed, periodic appraisals of all SNL, Albuquerque, sitewide management systems are not being performed. Furthermore, the KAO staff does not have a clear understanding of their ES&H roles, responsibilities, and authorities, resulting in an absence of formality and discipline in their ES&H surveillance activities. This is exemplified by inadequate surveillance schedules; uncertainties in documentation and reporting requirements; and insufficient tracking, trending and root cause analysis. Although AL performs reviews of non-DOE funded work and Cooperative Research and Development Agreements, these reviews do not assure that ES&H matters are adequately addressed.

SNL, Albuquerque, oversight of ES&H activities does not provide management with the assurance that an effective and sustainable ES&H program exists. The independent review system at SNL, Albuquerque, does not provide for sufficient independence and objectivity in the review process and does not involve the appropriate levels of management in the resultant decisionmaking process. Furthermore, independent appraisals of ES&H activities have not been performed as required. In addition, the oversight of construction subcontractors does not assure ES&H compliance. While the SNL, Albuquerque, review of non-DOE funded work provides adequate review of environmental concerns involving this work, it provides only minimal attention to safety and health impacts, and SNL, Albuquerque, has not established an ES&H review process for Cooperative Research and Development Agreements.

Sandia Corporation's strategic plan does not have subordinate implementation plans to define, guide, and accomplish, in an integrated manner, DOE's ES&H and program objectives at all sites managed by the Corporation for DOE. An ES&H strategic plan, and subordinate implementation plans, would provide Sandia Corporation with a defensible basis for establishing ES&H priorities and allocating ES&H resources among its sites. It would enable Sandia Corporation to develop long-term, needs-based, integrated approaches to budget formulation, human resource management, training, and regulatory compliance at SNL, Albuquerque. In the absence of such a plan, Sandia Corporation cannot assure that its vision of ES&H excellence will be effectively incorporated into the mission and operation of SNL, Albuquerque, and at each of the other Sandia facilities.

SNL, Albuquerque, management systems are not in place to control resources, monitor performance, and provide management with information necessary for ES&H decisionmaking. Management systems should provide tracking, trending, and reporting of ES&H activities with respect to cost, schedule, and performance. There are deficiencies in the implementation of integrated

ES&H planning and project management, integrated reporting of performance indicators, root cause analysis, corrective actions, and lessons-learned. A human resource management system has not yet been implemented to assure that staffing requirements, staffing availability, and staff development needs are identified and met. The ES&H Quality Plan has not been fully implemented and, therefore, has had little impact on improving the quality of the ES&H Program. The Conduct of Operations Program is only in the very early stages of implementation. ES&H documents and procedures are not effectively controlled, and there is an incomplete configuration management system.

SNL, Albuquerque, does not have a formal sitewide training, verification, and certification program to ensure that fully qualified personnel are performing ES&H activities. SNL, Albuquerque, management is in the process of instituting an array of new ES&H programs and initiatives to meet DOE requirements. However, it has not established formal processes to identify training needs required to implement these programs and initiatives. Nor is there a centrally coordinated sitewide training program in place to ensure that the quality of training programs are uniform throughout SNL, Albuquerque. Job task analysis methodologies were not being applied sitewide. Furthermore, there were no formal processes for evaluating the effectiveness of training and certification programs or to assure that subcontractor employees have the necessary ES&H training and certification.

2.3.2 Root Causes

The Management Subteam identified three root causes for the findings and concerns discussed in this assessment. The root causes are as follows:

The failure of AL to provide adequate oversight of ES&H activities at SNL, Albuquerque, is, primarily, a reflection of the historic priority placed on program performance by the Office of Defense Programs.

This priority has driven AL to emphasize, in their management, program-related rather than ES&H-related activities. In the past several years, AL began a number of initiatives to improve the posture of its ES&H operations and, as Defense Programs began to reorder its priorities, these efforts have intensified. This was exemplified by the establishment of KAO, increases in ES&H staffing throughout AL, and increased emphasis on waste minimization. Sustaining the new DOE priority on ES&H is particularly important if the promise of SNL, Albuquerque's, recent ES&H performance is to be realized. ES&H excellence relies as much on the priority given ES&H by DOE as it does on SNL, Albuquerque's, resolve to attain such excellence.

The management style of SNL, Albuquerque, which places a high premium on responsiveness to program customer demands, has resulted in a posture where it is just beginning to respond to the recent DOE ES&H initiatives.

SNL, Albuquerque's, principal program customer has placed a higher priority on program-related activities than it has on ES&H-related activities. As a result, fundamental management systems needed for an effective ES&H program, e.g., quality assurance, conduct of operations, performance monitoring and assessment, are incomplete or fragmentary. However, concern for the special nature of ES&H requirements, which involve public and

3.0

Environmental Assessment

3.0 ENVIRONMENTAL ASSESSMENT

3.1 PURPOSE

This section presents the findings developed by the Environmental Subteam during the Tiger Team Assessment of the Sandia National Laboratories (SNL), Albuquerque, New Mexico. The assessment was conducted from April 15 through May 24, 1991. SNL, Albuquerque, is a U.S. Department of Energy (DOE) multiprogram research and development laboratory. The scope of the environmental assessment included: SNL, Albuquerque; Albuquerque Field Office (AL); and Kirtland Area Office (KAO). Ross Aviation, Albuquerque Microelectronics Operations, and Central Training Academy were also assessed by the Environmental Subteam and are discussed in Section 7.0 of this report. The results of the environmental portion of the Tiger Team Assessment will provide the Secretary of Energy with information on current environmental regulatory compliance status and associated vulnerabilities of each facility, root causes for noncompliance, adequacy of DOE and site contractor environmental management programs, and response actions to address the identified problem areas; and will aid in tracking DOE-wide environmental compliance trends.

3.2 SCOPE

The scope of the SNL, Albuquerque, environmental assessment was comprehensive, covering all environmental media and applicable Federal, State, and local regulations and requirements, DOE Orders, and best management practices. The environmental disciplines addressed in this assessment include air, surface water, groundwater/soil, waste management, toxic and chemical materials, quality assurance, radiation, inactive waste sites, and the requirements of the National Environmental Policy Act (NEPA).

3.3 APPROACH

The Environmental Subteam assessment of SNL, Albuquerque, was conducted in accordance with the Tiger Team Guidance Manual (February 1990) and followed accepted assessment techniques. The assessment was conducted by a team managed by a Team Leader and Assistant Team Leader from the DOE Office of Environmental Audit, an Assistant Team Leader from the Office of Special Projects, and technical specialists from other DOE offices and support contractors. The names, responsibilities, affiliation, and biographical sketches of the Subteam members are provided in Appendix A-2.

The environmental assessment of SNL, Albuquerque, included three phases: planning, onsite activities, and reporting. The Environmental Assessment Plan, which outlines the key issues to be addressed, the general approach, and specific onsite activities, is provided in Appendix B. The Environmental Subteam Tentative Agenda, included as part of the Assessment Plan, details the planned daily activities of the team. The finalized daily agenda is included as Appendix C. Appendices D and E reflect the Contact/Interviews and Site Documents, respectively, that the Environmental Subteam used in developing its assessment and findings.

A pre-assessment site visit was conducted on March 19 through 21, 1991, to describe the purpose and assessment methodology to SNL, Albuquerque; AL; and KAO personnel. Meetings were held with State of New Mexico and local

environmental regulators and collective bargaining unit officials to explain the process. Representatives of the Indian Nations were invited to attend; however, they were unable to participate.

The onsite activities for the environmental assessment took place from April 15 through May 24, 1991. Onsite activities included document review; observation of site operations; interviews with DOE and site contractor staff, and personnel from Federal, State, and local regulatory agencies; review of previous surveys, audits, and self-assessments; Environmental Subteam daily debriefs; and the development of the findings presented in this section of the report.

The Environmental Subteam identified findings in three categories: compliance findings (CFs), best management practice (BMP) findings, and noteworthy practices (NWP).

- Compliance findings are conditions that, in the judgment of the assessment team, may not satisfy environmental regulations, applicable DOE Orders (including internal DOE memoranda, where referenced), consent orders, agreements with regulatory agencies, or permit conditions. When programs or procedures are not sufficiently developed or implemented to ensure compliance, then any related issues are considered compliance findings. A failure to follow internal procedures may also be considered a compliance finding, if in the judgment of the team, the intent of the procedure is to support environmental compliance.
- BMP findings are conditions where, in the judgment of the assessment team, best management practices could and should be employed. The BMP findings are based on regulatory guidance, accepted industry procedures and practices, and professional judgment of the team members.
- Noteworthy practices are those practices which in the judgment of the assessment team, have general application to other DOE facilities and should be documented for the purpose of information transfer.

3.4 ENVIRONMENTAL ASSESSMENT SUMMARY

The Environmental Subteam identified 82 findings during its assessment of SNL, Albuquerque. None of the findings reflect situations that present a near-term threat to public health or the environment. Seventy-one findings reflect problems that satisfy the definition of a compliance finding. Eleven findings represent conditions in which best management practices are not employed. The Environmental Subteam identified one noteworthy practice. The titles of the environmental findings are presented in Table 3-1 by media or discipline, as appropriate.

As part of the Environmental Subteam assessment, other reports on environmental compliance or environmental problems at SNL, Albuquerque, were reviewed. These reports included the Pre-Tiger Team Self-Assessment (PTTSA) Report, January 1991; DOE-AL Self-Assessment Report, April 1991; Albuquerque Field Office, Kirtland Area Office, Self-Assessment Report, March 1991; Environment, Safety, and Health Action Plan for PTTSA Report (FS&H Action

**TABLE 3-1
ENVIRONMENTAL FINDINGS**

Air

A/CF-1	Inventory, Characterization, and Registration of Air Emission Sources
A/CF-2	Air Pollution Control Equipment
A/CF-3	Stack Monitoring at Steam Plant
A/CF-4	NESHAP for Radionuclides from DOE facilities
A/CF-5	Ambient Air Quality Surveillance Network
A/CF-6	Meteorological Programs
A/CF-7	Gasoline Delivery to Technical Area III and Coyote Test Field Gasoline Tanks
A/CF-8	Permitting of Soil Disturbance at Construction Projects
A/CF-9	Permits for Open Burning
A/CF-10	Emergency Power Generators in Building 862
A/BMPF-1	Uncontrolled Emissions

Surface Water

SW/CF-1	Backflow Prevention Device and Cross-Connection Programs
SW/CF-2	Spill Prevention Control and Countermeasures
SW/CF-3	Secondary Containment
SW/CF-4	Program to Monitor and Maintain the Water Distribution, and Sanitary and Storm Sewer Systems
SW/CF-5	Policies, Procedures and Training Related to Discharges to Ground and Sewers
SW/BMPF-1	Publicly Owned Treatment Works Permits and Reporting

Groundwater/Soil

GW/CF-1	Sitewide Hydrogeological and Monitoring Well Network
GW/CF-2	Radiological and Nonradiological Environmental Surveillance Program
GW/CF-3	Groundwater Sampling and Analysis
GW/CF-4	Groundwater Protection Management Program Plan
GW/BMPF-1	Closure and Protection of Wells and Boreholes

Waste Management

WM/CF-1	Sanitary and Non-Hazardous Waste
WM/CF-2	Used Lead Program
WM/CF-3	Waste Characterization
WM/CF-4	Mixed Waste Characterization
WM/CF-5	Mixed Waste Storage
WM/CF-6	Mixed Waste Inventory
WM/CF-7	Hazardous Waste Management Facility
WM/CF-8	Satellite Accumulation
WM/CF-9	Classified Waste
WM/CF-10	Classified Waste Landfill
WM/CF-11	Hazardous Waste Training for Generators
WM/CF-12	Hazardous Waste Thermal Treatment Unit
WM/CF-13	Waste Minimization Program
WM/CF-14	Hazardous Waste Manifests
WM/CF-15	Underground Storage Tank Program
WM/CF-16	Transuranic Waste

TABLE 3-1 (Continued)
ENVIRONMENTAL FINDINGS

WM/CF-17	Low-Level Waste Performance Assessment
WM/CF-18	Radioactive Waste Volume Reduction
WM/CF-19	Low-Level Waste Characterization
WM/CF-20	Low-Level Waste Certification Program
WM/CF-21	Long-Term Storage of Low-Level Waste
WM/CF-22	Technical Area III Low-Level, Mixed Waste and Classified Waste Landfills
WM/BMPF-1	Development and Submission of RCRA Permit Application
WM/BMPF-2	Evaluation of Offsite Treatment, Storage, and Disposal Facilities

Toxic and Chemical Materials

TCM/CF-1	Storage of Toxic and Chemical Materials
TCM/CF-2	Pesticide/Herbicide Program

Quality Assurance

QA/CF-1	ES&H Records Management Program
QA/CF-2	Environmental Quality Assurance Audit and Appraisal
QA/CF-3	Calibration of Measuring and Test Equipment Used for Environmental Monitoring
QA/CF-4	Procurement Process for Materials and Services
QA/CF-5	ES&H Directorate (3200) Corrective Action Program
QA/CF-6	Use of Procedures
QA/CF-7	Environmental Incident Reports

Radiation

R/CF-1	Liquid Radiological Effluent Monitoring
R/CF-2	Certification of Compliance with DOE Order 5400.5
R/CF-3	Liquid Discharges to Previously Contaminated Areas
R/CF-4	Release of Radioactively Contaminated Real Property
R/CF-5	Environmental Monitoring Plan
R/CF-6	Environmental Contamination Control
R/CF-7	Annual Radiological Monitoring Report
R/CF-8	Outdoor Storage of Contaminated Materials
R/CF-9	Post-Accident Radiological Environmental Surveillance and Dose Assessment
R/CF-10	Radioactive Effluent/On-site Discharge Reports
R/CF-11	Environmental Aspects of Safety Analysis
R/CF-12	Environmental Review of Operational and Facility Changes
R/CF-13	Program for Decommissioning Decontaminated Facilities
R/CF-14	Control of Radioactively Contaminated Personal Property
R/CF-15	Incorporating Environmental Design Criteria into New Facilities and Modifications

Inactive Waste Sites

IWS/CF-1	Identification of Reportable-Quality Releases
IWS/BMPF-1	Property Transfer
IWS/BMPF-2	Documentation of Assessment Discrepancies
IWS/BMPF-3	Community Relations for the Environmental Restoration Program

TABLE 3-1 (Continued)
ENVIRONMENTAL FINDINGS

IWS/BMPF-4 RCRA/CERCLA Regulatory Interface in Environmental Restoration Program
IWS/BMPF-5 Identification and Evaluation of Waste Sites

National Environmental Policy Act

N/CF-1	NEPA Review Procedures and Decisionmaking at SNL
N/CF-2	Sitewide NEPA Documents
N/CF-3	Appropriate NEPA Review
N/CF-4	Tracking and Recordkeeping for NEPA and Project Documentation
N/CF-5	Authority for NEPA Determinations
N/BMPF-1	KAO NEPA Reviews

Ross Aviation, CTA, AMO

RA	SW/CF-1	NPDES Permit for Ross Aviation
CTA	SW/CF-1	Drinking Water Quality - Central Training Academy
AMO	A/CF-1	Air Emission Inventories at AMO
AMO	QA/CF-1	Albuquerque Microelectronics Operation Quality Assurance Program Plan

Plan), April 1991; and Environmental Survey Preliminary Report, Sandia National Laboratories, Albuquerque, NM, April 1988. The subteam reviewed the PTTSA Report and the ES&H Action Plan to evaluate the effectiveness of the site's self-assessment in relation to the Tiger Team environmental assessment findings. This is discussed in Section 6.0.

The Environmental Survey Preliminary Report identified 35 applicable findings. As of May 1991, 11 of these deficiencies have been corrected. Of the remaining 24 deficiencies, 10 are part of the DOE - Environmental Restoration (ER) program in the Office of Environmental Restoration and Waste Management (EM), and 14 have not been completed. The survey findings outside the scope of this assessment have not been addressed here. The findings that are part of the DOE-ER program have been prioritized and will be characterized and remediated as part of the DOE-ER Five-Year Plan (FYP). Table 3-2 provides an Overall Status Summary.

Although many of the findings have been corrected and others have been prioritized for corrective action or included in the Five-Year Plan, action on the findings has been slow.

A number of the findings address a lack of, or weaknesses in, environmental programs. The use of the term "program" has created some confusion among SNL, Albuquerque, and KAO personnel because of a very specific, narrow definition of "Program" presented in the SNL, Albuquerque, document "Generic ES&H Standard Operating Procedure, Instruction for Writing ES&H Program Documents" (GN740004). This document defines a "Program" as a plan under which detailed requirements are established, detailed responsibilities are delineated, and organization interfaces are defined for implementation of the requirements. The definition of program used by the Tiger Team is much broader and includes all those systematic planned and executed actions that are necessary to effectively achieve environmental excellence. This includes, but is not limited to, formal policies, plans, standards, implementing procedures, training, oversight, performance measures, tracking systems, corrective action systems, and feedback systems. This definition is derived from DOE Order 5480.19, Conduct of Operations, and ANSI/ASME NQA-1. SNL, Albuquerque's, definition of "Program" is what the Tiger Team would define as the portion of an implementation plan that lays out what the broad-definition program will accomplish.

The Environmental Subteam has identified four key findings, each of which is comprised of multiple findings, or portions of individual findings from Section 3.5. In some cases, the component findings, taken individually, might not appear to be significant enough to be identified as key, but collectively they represent those issues of greatest concern. The key findings are as follows:

Inadequate Sitewide Programs for the Management of Wastes

The management of hazardous, radioactive, mixed, and solid wastes is inconsistent throughout SNL, Albuquerque, and is generally not sufficiently well-defined or formalized to ensure compliance with DOE Orders or regulatory requirements. The authority and responsibility for many waste management activities have been delegated to the Directorates, but accountability is weak. In addition, neither adequate formal sitewide guidance or standards, nor an effective mechanism to track performance and enforce those standards, have been established. Waste management is particularly weak in such key

TABLE 3-2
ENVIRONMENTAL SURVEY REPORT - AUGUST 16 THROUGH SEPTEMBER 4, 1987
OVERALL STATUS SUMMARY

Env. Survey Prelim Report Finding No.	Action Plan Finding No.	STATUS COMPLETE	STATUS INCOMPLETE	PART OF DOE-ER FIVE-YEAR PLAN	CURRENT FINDING
SW II-1	ES 87-1		✓		
SW II-3	ES 87-2			✓	
SW IV-1	ES 87-3	✓			
SW IV-3	ES 87-4		✓		SW/CF-7
SW IV-5	ES 87-5	✓			
GW II-1	ES 87-6		✓		GW/CF-1
GW III-1	ES 87-7		✓		GW/CF-1
GW III-2	ES 87-8		✓		GW/CF-1
GW IV-1	ES 87-9		✓		GW/BMPF-2
WM II-1	ES 87-10			✓	
WM III-1	ES 87-11		✓		WM/CF-1
WM III-3	ES 87-12			✓	
WM IV-1	ES 87-13		✓		WM/CF-B
WM IV-2	ES 87-14		✓		WM/CF-C
TCM II-1	ES 87-15	✓			
TCM II-2	ES 87-16	✓			
TCM III-1	ES 87-17	✓			
TCM III-2	ES 87-18	✓			
TCM IV-1	ES 87-19	✓			
TCM IV-2	ES 87-20	✓			

TABLE 3-2
ENVIRONMENTAL SURVEY REPORT - AUGUST 16 THROUGH SEPTEMBER 4, 1987
OVERALL STATUS SUMMARY

Env. Survey Prelim Report Finding No.	Action Plan Finding No.	STATUS COMPLETE	STATUS INCOMPLETE	PART OF DOE-ER FIVE-YEAR PLAN	CURRENT FINDING
RAD II-1	ES 87-21		✓		RAD/CF-4, 4A, 16
RAD II-2	ES 87-22			✓	
RAD IV-1	ES 87-23		✓		A/CF-7
RAD IV-2	ES 87-24		✓		A/CF-7
RAD IV-3	ES 87-25		✓		A/CF-7
QA IV-1	ES 87-26		✓		QA/CF-3
QA IV-2	ES 87-27	✓			
QA IV-3	ES 87-28	✓			
IWS III-1 to 4	ES 87-29 to 32			✓(4)	
IWS III-5	ES 87-33			✓	
IWS III-6	ES 87-34			✓	
IWS IV-1	ES 87-35	✓			
	TOTAL	11	14	10	

*Key to Environmental Survey Preliminary Report Findings - Media, category, finding number. For example: SWII-1 refers to Surface Water, Category II, Finding Number 1.

areas as waste characterization, training, procedures, and the management of storage and accumulation areas.

Lack of Formal, Approved Environmental Procedures

The conduct of compliant environmental protection activities at SNL, Albuquerque, has been and is continuing to be greatly hindered by a lack of accurate, consistent, formal procedures and the failure to integrate procedures into comprehensive, coordinated environmental programs. The Environmental Subteam has observed procedural weaknesses both on a sitewide basis and in isolated departments and divisions. Specific procedural problems identified include a lack of procedures for many activities, inaccurate or insufficiently detailed procedures, insufficient training, and the use of unapproved draft procedures.

Inadequate Environmental Quality Assurance (QA)

The application of QA to environmental protection activities at SNL, Albuquerque, is not sufficient to provide assurances that DOE Order and regulatory requirements are being satisfied. Environmental QA activities are not included in a formal program of audits and surveillances, are not well documented, and are not monitored using a comprehensive set of performance measures. This lack of QA has resulted in the inability of SNL, Albuquerque, to establish effective control of environmental programs.

Inadequate Identification, Monitoring, and Control of Potential Air Emission Sources

SNL, Albuquerque, does not have the necessary programs in place to provide accurate identification, monitoring, or control of potential air emission sources. Deficiencies have been noted in a number of the key elements for air-quality protection, including the lack of ambient air quality monitoring, incomplete evaluations of potential emission points, lack of a site-specific meteorological program, and the failure to establish comprehensive plans to achieve compliance with DOE Orders and regulations.

3.5 ENVIRONMENTAL FINDINGS

The findings are presented under chapters identified by media (e.g., air and surface water), or regulation (e.g., NEPA). Titles chosen for the individual findings are topical, rather than descriptive. Each finding is preceded by a Performance Objective. The Performance Objectives for compliance findings are derived from promulgated environmental regulations and applicable DOE Orders and policies, compliance agreements, and facility permit conditions. The Performance Objectives for BMP findings are derived from regulatory agency guidance, accepted industry practices, and the professional judgment of the technical specialists. The findings within each section are not arranged in order of relative significance. Parenthetical references in Chapter 3 refer to citations of interviews and documents listed in Appendices D and E, respectively.

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3.5.1 Air

3.5.1.1 Overview

The air assessment at SNL, Albuquerque, consisted of an evaluation of current practices with regards to regulations promulgated by the Federal Environmental Protection Agency under the Clean Air Act and by the Albuquerque/Bernalillo County Air Quality Control Board (ABC/AQCB), and permits issued pursuant to these regulations; DOE Orders; and best management practices. A list of applicable air regulations, requirements, and guidelines used in this assessment is provided in Table 3-3.

The general approach to the air portion of the Environmental Subteam Assessment included the following activities: an examination of major facilities and major sources, including emission controls and emission sampling and monitoring programs, a review of the Air Quality Management Program at SNL, Albuquerque, and its implementation; interviews with personnel in the SNL, Albuquerque, Environmental Safety and Health Directorate, Facilities Engineering, SNL, Albuquerque, line organizations, DOE/Kirtland Area Office, Albuquerque/Bernalillo County Environmental Health Department/Air Pollution Control Division, and State of New Mexico Environment Department; and a review of site documents including applications for source registration certificates, air permits, correspondence with regulatory agencies, standard operating procedures, environmental reports, and various other internal documents.

SNL, Albuquerque, has many potential sources of radioactive and nonradioactive air contaminants. The radioactive air emissions are regulated by DOE Orders and by the National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities, 40 CFR 61, Subpart H. The nonradioactive air emissions sources at SNL, Albuquerque, are primarily regulated by the ABC/AQCB, which also ensures consistency with Federal and New Mexico regulations.

Radionuclides are released to the atmosphere from several different sources at SNL, Albuquerque. Almost 80 percent of the total radioactivity released from SNL, Albuquerque, is released during operations of the Annular Core Research Reactor (ACRR) (R-219). Other smaller radionuclide emission sources include the HERMES III, SATURN and PBFA 2 accelerators, Hot Cell Facility, Sandia Pulse Reactor, and various testing and research facilities. The types of radioactive materials emitted by these facilities include noble gases (argon-41 and krypton-85), radioiodine (I-129), tritium, and the radioactive gases oxygen-15 and nitrogen-13. The ACRR facility has two effluent filter systems, one for the High Bay and the other for the Experiment Cavity. Air exhausted from the High Bay is exhausted, unfiltered, via a stack in the normal mode of operation, and through HEPA (High Efficiency Particulate Air) filters during emergencies. All air purged from the Experiment Cavity is passed through a filter bank consisting of a prefilter, two HEPA filters, and two charcoal filters (for radioiodine adsorption) before release to the atmosphere. The Sandia Pulse Reactor also has a roughing filter, HEPA filter, and charcoal absorber in series. The accelerator and research facilities do not have HEPA filtration, since the radionuclides that they emit have either very short half-lives, are not effectively removed by filters, or are small-quantity emitters of radioactive effluents.

**TABLE 3-3
LIST OF APPLICABLE AIR
REGULATIONS/REQUIREMENTS/GUIDELINES**

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE 5500.3	Emergency Planning and Response Program	DOE
DOE 5480.1	Conduct of Operations	DOE
DOE 6430.1A	General Design Criteria	DOE
DOE/EH-01731	Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance	DOE
40 CFR 264.250(c)(3), 264.301(i), and 264.273(f)	Resource Conservation and Recovery Act (RCRA) Requirements for Particulate Emissions from Permitted Waste Piles, Landfills, and Land Treatment Units	EPA
40 CFR 260-271	Hazardous Waste Incinerators	EPA
40 CFR 300	Emergency Planning and Community Right-To-Know (EPCRA, also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, Section 313: Toxic Chemical Release Reporting)	EPA
40 CFR 61	National Emission Standards for Hazardous Air Pollutants (NESHAP)	EPA
40 CFR 51	State Implementation Plan as Required by the Clean Air Act	EPA
New Mexico Air Quality Control Regulations	New Mexico Air Quality Control Act	Health and Environment Department
Air Quality Control Regulations 3, 5, 8, 9, 11, 15, 16, 17, 19, 20, 22, 31	Ambient Air Quality Standards and Air Quality Control Regulations for Albuquerque/Bernalillo County	ABC/AQCB

SNL, Albuquerque, radionuclide air monitoring programs do not yet meet EPA and DOE standards. There are emission points that have not been evaluated, have not been monitored, or had air flow rates characterized. Progress has been made at some of the facilities at the Laboratory. New continuous air samplers have been installed on the Hot Cell Facility and the ACRR; however, these instruments need further evaluation to properly subtract natural background radiation contributions from the monitoring results. The Laboratory has made little progress on compliance with the NESHAP regulation for radionuclides at 40 CFR 61, Subpart H. This regulation was promulgated on December 15, 1989, and DOE facilities had ninety days to come into compliance. The SNL, Albuquerque, management philosophy on compliance to this regulation was to wait for a MOU to be signed between EPA and DOE and to not proceed on compliance actions. SNL, Albuquerque, management did not want to expend resources to achieve compliance until the agreements in the MOU had been finalized, and the requirements for compliance were defined. However, the draft MOUs that have been disseminated throughout DOE (for comment and information) since December, 1990, would not significantly reduce the scope and depth of this regulation if they were signed. Thus, the SNL, Albuquerque, decision to wait until the MOU is approved by both agencies is not prudent, and has resulted in the Laboratory being out of compliance with the NESHAP regulation for over 1 year.

Ambient air quality has never been assessed at SNL, Albuquerque. An ambient air quality network is valuable to evaluate natural background radiation, contributions from other man-made sources of radionuclide emissions, and to measure unplanned releases. These networks are also useful in proving that facility emissions do not impact the environment and to provide a data trail for liability protection. There are sources for potential radionuclide emissions from facilities in addition to SNL, Albuquerque, such as Inhalation Toxicology Research Institute, Kirtland Air Force Base, university laboratories, and major medical facilities.

The SNL, Albuquerque, meteorological program relies on the weather data from the Albuquerque International Airport. For the Technical Areas, these data are probably adequate to characterize the main site. However, these data are not representative of the remote areas, which are 10 kilometers or more from the airport. SNL, Albuquerque, recognizes that this is a weakness in their environmental program and has plans in place to upgrade this area.

Air contaminant emissions at SNL, Albuquerque, include oxides of nitrogen, carbon monoxide, sulfur dioxide, and particulates. These are emitted by the steam plant, the standby emergency power generators, portable generators that are used at the remote test sites, waste-burning activities at the Light Initiated High Explosives Laboratory, open burn experiments at the burn site, and explosives testing at various sites. Volatile organic compounds are released from vapor degreasers, solvent cleaning benches, gasoline dispensing facilities, paint spray booths, and solvents venting from fumehoods and bulking operations at the Hazardous Material Treatment Facility. Particulate matter is potentially released from baghouses serving machine shops, carpentry shops, the pattern shop, and sandblasting facilities, from construction sites, and from asbestos removal and disposal activities. Toxic air pollutants are potentially emitted from hundreds of laboratories. These sources and activities are regulated by the ABC/AQBC Air Quality Control Board regulations, and the National Emission Standard for Hazardous Air Pollutants regarding asbestos.

The SNL, Albuquerque, Air Quality Management Program outlines the responsibilities, goals, and objectives, and provides guidance for operational requirements (A-25). It was approved January 29, 1991, and was distributed to top level ES&H personnel as of March 31, 1991. The need for further development of the program has been identified and the Line Managers ES&H Action Team is in the process of doing this.

Because of the short elapsed time since the "Program" was approved, the air program is incomplete as indicated by the nature of the findings that were detected. Four of the findings covered air permit requirements of the ABC/AQCB regulations. These noncompliances related to stack monitoring of the Steam Boilers in Building 605, permitting of soil disturbances at construction projects, permits for open burning, and the permit for the emergency power generators in Building 862. Three additional findings were nonconformances pertaining to the proper operation of equipment, and processes that could potentially emit air pollutants. These included the lack of procedures for the proper operation of air pollution control equipment such as HEPA and particulate filters, the lack of vapor recovery systems on gasoline tanks, and the lack of procedures and controls for equipment that has the potential for emissions, such as vapor degreasers, and solvent cleaning benches.

In contrast to the air program, the asbestos program at SNL, Albuquerque, is a mature program, with an impressive array of documentation encompassing well-developed procedures for all stages of asbestos abatement. All programs receive an annual review to incorporate new regulations. Critiques by independent outside experts and lessons learned from other DOE sites have been sought and integrated into the program. It is commendable that all asbestos abatement projects are treated at the level of an Asbestos Hazard Emergency Response Act program, even though this is not required. Active involvement with the site personnel is ongoing, with regular information updates provided at open seminars in the Technology Transfer Center. The net result is that the asbestos program is running smoothly. This was verified with first-hand observations through all stages of abatement, including notification to local officials, building preparation, the abatement process, and finally disposal of the asbestos in the Kirtland Area Landfill.

3.5.1.2 Compliance Findings

FINDING A/CF-1: Inventory, Characterization, and Registration of Air Emission Sources

Performance Objective

Albuquerque/Bernalillo County Air Quality Control Board (ABC/AQCB) Regulation 22.01 requires that owners or operators of any commercial or industrial stationary source which emits more than 2,000 pounds of any air contaminant per year or any amount of a hazardous air pollutant obtain a Registration Certificate for the source.

"Air contaminant" is defined in ABC/AQCB Regulation 2.01 as meaning any substance, including but not limited to, any particulate matter, fly ash, dust, fumes, gas, mist, smoke, vapor, microorganisms, radioactive material, any combination thereof, or any decay or reaction product thereof.

"Hazardous air pollutant" is defined in ABC/AQCB Regulation 20.13(I) as meaning an air contaminant which has been published or designated as a "hazardous air pollutant" by the administrator of EPA pursuant to Section 112 of the Federal Clean Air Act.

ABC/AQCB Regulation 22.02 requires that applications for such Registration Certificates include, among other information, the nature and amounts of any air contaminants emitted from the source.

ABC/AQCB Regulations do not address any requirements with regard to toxic air pollutants. In the absence of regulations at the ABC/AQCB level, the New Mexico Air Quality Control Act, Regulation 752, Registration of Existing Toxic Air Pollution Sources, requires the registration of all sources of a specific list of toxic air pollutants.

DOE 5400.1, General Environmental Protection Program, Section 5.a, states that it is DOE policy to conduct the Department's operations in compliance with the letter and spirit of applicable environmental statutes, regulations, and standards.

Finding

There is no implementing program, procedures, or other formal guidance to ensure compliance with regulatory requirements to register sources of air contaminants, hazardous air pollutants, and toxic air pollutants.

Discussion

Sources of air contaminants, hazardous air pollutants, and toxic air pollutants have been registered with the ABC/AQCB; however, sources emitting a specific list of toxic air pollutants have not been registered with the State of New Mexico according to Regulation 752. A review process, such as an annual update of emissions sources to accommodate changes in operations and new activities, is necessary to ensure that stationary air sources at SNL, Albuquerque, are properly registered with the ABC/AQCB. An inventory of all air emission sources is needed, as well as a characterization of the types and amounts of air contaminants, hazardous air pollutants, and toxic air

pollutants, to determine whether emissions exceed the threshold values above which registration is required.

In response to a request from ABC/AQCB, SNL, Albuquerque, submitted a Toxic Air Contaminant Source Registration Form in July 1987. This submittal contained the following minor problems:

- The forms provided by the ABC/AQCB were not filled out; however, the requested data were provided in another format.
- The methodologies used for estimating evaporation rates were not explained.
- The calculations for making yearly estimates of emissions were not made as explained in the cover letter.

This finding was partially identified in the PTTSA Report and the ES&H Action Plan.

FINDING A/CF-2:**Air Pollution Control Equipment****Performance Objective**

DOE 5480.19, Conduct of Operation Requirements for DOE Facilities, Chapter VIII, states that it is imperative that equipment and systems in a DOE facility be properly controlled. Not only must the operating shift be aware of how equipment and systems will function for operational purposes, but to satisfy the design bases and the operational limits, the proper component, equipment, and system configurations must be established and maintained.

DOE 6430.1A, General Design Criteria, provides standards and requirements for control devices for radionuclide emissions and air pollution control in general.

DOE 5400.5, Radiation Protection of the Public and the Environment, Chapter II, Section 2, the ALARA (as low as reasonably achievable) Process, states that Field Elements shall develop a program and shall require contractors to implement the ALARA Process for all DOE activities and facilities that cause public doses.

Finding

The site has not developed an adequate program or procedures for the design, operation, and maintenance of air pollution control equipment.

Discussion

A wide variety of pollution control equipment is used throughout SNL, Albuquerque, ranging from High Efficiency Particulate Air (HEPA) filters, air scrubbers, charcoal absorbers, and conventional packed fiberglass filters to vacuum baghouse systems. There are no consistent standards applied to the operation of the various systems. Although the line organizations have a degree of familiarity with the proper operation of the equipment in their areas, in several instances they were not familiar with the particular operating parameters, their proper ranges of operation, and maintenance requirements, and, in general, were operating their equipment from the standpoint of keeping their production operations on schedule and were not necessarily sensitive to the operation of the equipment from the standpoint of minimizing emissions to the air (I-A-22).

In Technical Area V, the Hot Cell HEPA Filters are dioctylphthalate (DOP) tested for efficiency and tested for radiation annually and only changed-out if they are radioactively contaminated. The Annular Core Research Reactor (ACRR) HEPA Filters include one set of filters that is changed annually whether or not they are contaminated. In this case, there is no documentation explaining the rationale for one practice versus the other (I-A-92). In addition, the magnehelic gauges located on the roof which measure the pressure across the filters at the ACRR were unreadable because the plastic covers had clouded over due to the sun exposure and, thus, could not be put to their intended use. Although the gauges used by the staff to monitor the filters are located in the control room, the rooftop gauges can not be used to independently verify the control room readings.

The Hazardous Waste Management Facility has a HEPA filtration system on the drum crusher (I-A-47); however, there is no schedule for maintenance of the filters and there are no pressure differential measurements across the system. The fume hood used at that facility has no filter on it at all.

Five baghouse vacuum systems for controlling process particulate matter emissions were observed by the Tiger Team. These baghouse systems, in general, are being operated without the benefit of written operating procedures that would ensure that the systems are operating properly and efficiently. The following systems were observed:

- Building 840, Machine Shop, south-side baghouse.
- Building 840, Machine Shop, east-side baghouse.
- Building 866, Wood Fabrication Center, vacuum baghouse system.
- Building 841, Pattern Shop, sawdust baghouse system.
- Building 841, Sandblast Chamber, baghouse for fine garnet dust.

Paint spray booths located throughout the site also have no operating procedures in place.

- In the Facilities Services Building, small paint overspray particles escape capture on filters in the paint spray booth ventilation system and are deposited on cars in the parking lot. There are pressure difference gauges across the filter systems; however, the operators were unfamiliar with the operating parameters and what the indication would be if the filters required changing. In addition, the gauges were out of calibration.
- The paint spray booths at the motor pool and the coatings laboratory similarly had no operating procedures and personnel were unfamiliar with operation of the pressure differential gauges across the filters.

There are a number of exhaust gas scrubber systems with varied functions and product gases that require cleanup prior to being exhausted to the atmosphere. Some of the systems are particularly well run by the personnel who are in charge of the equipment. However, in the event that these personnel are reassigned, or are unavailable because of illness or vacation, the possibility of system malfunction or the misuse of the air pollution control equipment becomes a concern. Clearly defined procedures for operation and maintenance of these systems do not exist.

- At the Microelectronics Development Laboratory, two large scrubbers are operated in parallel to clean up acids, arsine, phosphine, and silane. The scrubbers have magnehelic pressure gauges across them; however, the plant personnel were unfamiliar with the proper use of the gauge indicators (I-A-4). This lack of familiarity with proper use of the gauges and a lack of a standard operating procedure led to the scrubbers becoming plugged on one

occasion in the recent past. The scrubbers were fed with untreated water, which eventually generated a precipitate, resulting in plugging of the scrubbers.

- The Process Development Laboratory (PDL) facility scrubber system is a good example of a well-designed and -maintained system with attentive real-time oversight of the equipment (I-A-98). However, lack of formalized procedures could lead to compliance difficulties in the future.

This finding was identified in the PTTSA Report and the ES&H Action Plan.

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FINDING A/CF-3:**Stack Monitoring at Steam Plant****Performance Objective**

Albuquerque/Bernalillo County Air Quality Board (ABC/AQCB) Control Regulation AQCR No. 18.02, Gas Burning Equipment - Nitrogen Dioxide, states that after December 31, 1974, no person owning or operating existing gas burning equipment having a heat input of greater than 1,000,000 million British thermal units (Btus) per year per unit shall permit, cause, suffer or allow nitrogen dioxide emissions to the atmosphere in excess of 0.3 pounds per million Btus of heat input.

ABC/AQCR Regulation 17.01, Oil Burning Equipment - Sulfur Dioxide, states that no person owning or operating oil burning equipment having a heat input of greater than 1,000,000 million Btus per year per unit shall permit, cause, suffer or allow sulfur, dioxide emissions to the atmosphere in excess of 0.34 pounds per million Btus of heat input.

NBC/AQCR Regulation 5.01, Visible Air Contaminants, General Stationary Sources, states that no person owning or operating any stationary source, shall cause or allow visible air contaminant emissions that exceed an opacity of 20 percent, 6 minute time-averaged.

ABC/AQCR Regulation 5.02C, Specific Stationary Sources, states that no person shall cause or allow visible emissions from any stationary diesel powered engine to exceed 20 percent opacity, 6 minute time-averaged. During the first 20 minutes of cold startup, the visible emissions shall not exceed 40 percent opacity, 6 minute time-averaged. Additionally, no increase of load shall be applied so as to cause an emission having greater than 40 percent opacity during any time interval.

ABC/AQCR Regulation 5.04, Test Procedures, states that visible emission limitations specified for diesel generator exhausts shall be determined by a certified observer using the standard visual method listed in 40 CFR 60 A, Method 9, or operation of equipment approved by the Director that is known to produce equivalent or better accuracy.

Finding

There has been no testing of the No. 1, No. 2, No. 3, No. 5, or No. 6 steam boiler units or the 350 kW diesel generator at Steam Plant, Building 605, to demonstrate compliance with local regulations.

Discussion

Both the No. 5 and No. 6 steam boilers in Building 605 have firing rate capacities that exceed the thresholds referenced in ABC/AQCR 18.02, thus requiring compliance with the nitrogen dioxide limitation (I-A-118 and I-A-119). In addition, the No. 6 steam boiler is a dual-fuel unit, fired with gas or oil and is subject to the firing-rate thresholds referenced in ABC/AQCR 17.01, thus requiring compliance with the sulfur dioxide limitation. Exhaust gases from the boilers and the diesel generator require observations by a certified smoke reader for visible emission opacity. Boiler No. 4 has been decommissioned.

Compliance with local regulations has never been verified with any testing or stack monitoring of these steam boilers. Also, there have been no opacity readings taken by a certified opacity observer on any of the steam boilers or the diesel generator exhausts.

These issues were partially addressed in the PTTSA Report and the ES&H Action Plan.

FINDING A/CF-4:

NESHAP for Radionuclides from DOE Facilities

Performance Objective

The National Emission Standard for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities (40 CFR 61, Subpart H), which was promulgated on December 15, 1989, contains detailed requirements and guidance for radionuclide emission standards, measurement, and quality assurance. A summary of the major requirements is listed below:

1. Paragraph 61.93 (a) requires the use of EPA-approved computer models to determine compliance with the dose standard.
2. Paragraph 61.93 (b) requires that emission rates from point sources (vents or stacks) be measured in accordance with EPA-approved procedures.
3. Paragraph 61.93 (b)(2)(iv) requires that a quality assurance program be conducted that meets EPA performance requirements.
4. Paragraph 61.95 requires that facilities maintain records documenting the source of input parameters, including the results of all measurements upon which they are based.

The National Emission Standard for Hazardous Air Pollutants (NESHAP) in 40 CFR 61.05(c) specifies that "ninety days after the effective date of any standard, no owner or operator shall operate any existing source subject to that standard in violation of the standard. . . ."

Finding

SNL, Albuquerque, does not have a program in place that has the necessary elements to ensure compliance with 40 CFR 61, Subpart H.

Discussion

The following specific deficiencies in the SNL, Albuquerque, NESHAP program were identified:

1. Procedures have not been written for effluent flow-rate measurements, and the current informal method does not comply with the required EPA Reference Methods (40 CFR 61.93 (b)(1)).
2. Radionuclides have not been directly monitored or extracted, collected, and measured according to 40 CFR 61.93 (b)(2)) and Appendix B Method 114, at the SNL, Albuquerque, facilities that are emitters of radionuclides (ACRR, SPR/CX, HERMES III, PBFA 2, Hot Cell Facility, and Building 935) (I-R-202, I-R-32 through I-R-37, and I-R-54).
3. Calculation are being used in lieu of required periodic confirmatory air sampling specified in 40 CFR 61.93(b)(4)(i), to estimate radionuclide emissions for the PBFA 2 and SATURN accelerators. These procedures were not approved by the EPA Administrator prior to use, as required in 40 CFR 61.93.(b)(2)(iii), 40 CFR 61.93 (b)(3), and 40 CFR 61.93(b)(4)(i) (R-204 and I-R-202). SNL, Albuquerque, had received direction and

approval from AL regarding this approach to compliance with the NESHAP regulations (I-R-273).

4. A quality assurance program has not been developed to comply with the requirements of 40 CFR 61.93 (b)(2)(iv) (I-R-202).
5. Not all potential release points which could cause an effective dose equivalent in excess of 0.1 mrem per year have been evaluated in accordance with the requirements of 40 CFR 61 (b)(4)(i). Examples of facilities not evaluated include Buildings 835 and 906. In addition, the evaluation is only partially complete for other points. Some radionuclides that could contribute greater than 10 percent of the dose equivalent were not considered, such as antimony-125 in the Hot Cell Facility, and mixed fission products in the Sandia Pulse Reactor (I-R-202, I-R-32, I-R-33, I-R-37).
6. Input values for the EPA-approved computer models required by 40 CFR 61.93 (a) have not been validated and verified by SNL, Albuquerque. The Laboratory has used a subcontractor to assess the input parameters, and to provide results for the report to EPA as required by 40 CFR 61.94 (a). For example, the average annual mixing height is listed as 2,055 meters in the SNL, Albuquerque, 1990 AIRDOS-EPA Data Upgrade and Dose Calculations Report. The source of this meteorological parameter is an Atomic Energy Publication from 1968. SNL, Albuquerque, personnel have not validated and verified this parameter used by the subcontractor, and could not document the source of this value as required in 40 CFR 61.95 (I-R-202).
7. SNL, Albuquerque, does not have a management plan to achieve compliance with 40 CFR 61, Subpart H (I-R-255). Managers responsible for implementing these requirements were unfamiliar with the regulatory requirements, and have not ensured that cognizant personnel are complying with regulatory requirements.
8. Oversight of 40 CFR 61, Subpart H, compliance efforts by AL has been ineffective. There have been no AL audits or inspections since the rules were promulgated (I-R-256).

This finding was identified in the PTTSA Report (Findings SF-CA-01-02-06, and SF-SB-02); however, discussion items 1, 3, 6, and 7 above were not discussed. The schedule and resource budget for compliance with 40 CFR 61, Subpart H, in the ES&H Action Plan will not ensure that the site achieves timely compliance to the NESHAP requirements. The projected completion date (December 15, 1993) is 4 years after the promulgation of the rules.

FINDING A/CF-5:**Ambient Air Quality Surveillance Network****Performance Objective**

DOE 5400.1, General Environmental Protection Program, Chapter IV, Paragraph 5.b(1), requires that an environmental surveillance program be implemented by November 9, 1991, to monitor the effects of DOE activities on the offsite environment.

DOE 5400.5, Radiation Protection of the Public and the Environment, Chapter 1, Paragraph 8a, specifies that DOE facilities shall have the capability to detect, quantify, and adequately respond to unplanned releases of radioactive material to the environment by May 8, 1990.

A DOE guidance document, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance (DOE/EH-0173T), sets forth an objective to properly and accurately measure radionuclides in ambient environmental media. Also, Chapter 5.7.1 states that "because air is a primary exposure pathway to humans from radionuclides released to the atmosphere, environmental air sampling should be conducted to evaluate potential doses to environmental populations from inhaled or ingested radionuclides or from external radiation."

Finding

SNL, Albuquerque, does not have an ambient air quality surveillance program for airborne radionuclides nor a plan to implement one by November 9, 1991.

Discussion

SNL, Albuquerque, has never had an ambient air quality monitoring network. The rationale for this decision was that since SNL, Albuquerque, did not emit large quantities of radionuclides, there was no reason to monitor the air pathway to the environment (I-R-202 and I-R-260). There is no documented evaluation to support this decision (I-R-202).

Ambient air quality monitoring data would help SNL, Albuquerque, demonstrate that its emissions are as low as effluent monitoring and calculations predict, should that become necessary. The Laboratory operates a variety of facilities that can emit radionuclides into the air, including the Annular Core Research Reactor, the Sandia Pulsed Reactor, a number of accelerators, and numerous radionuclide laboratories and testing facilities.

Additionally, because SNL, Albuquerque, does not have an ambient air quality monitoring network, it does not have the capability to detect, quantify, and adequately respond to unplanned releases of radioactive material to the environment (I-R-202).

The PTTSA Report did identify this deficiency (SF-CA-06, APR-CA-06, and SF-SB-02). There are action plans noted in the ES&H Action Plan, which identify the completion date of the program implementation as December 15, 1993. Therefore, SNL, Albuquerque, will not be able to meet the November 9, 1991, implementation deadline for DOE 5400.1 compliance.

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FINDING A/CF-6:**Meteorological Programs****Performance Objective**

40 CFR 61.94 requires the acquisition of meteorological data to demonstrate compliance with the National Emission Standard for Hazardous Air Pollutants; Radionuclides.

DOE 5400.1, General Environmental Protection Program, Chapter IV, Section 6, requires the development and implementation of a meteorological information/monitoring program to collect representative meteorological data in support of environmental surveillance programs by November 9, 1991.

DOE 5400.5, Radiation Protection of the Public and Environment, Chapter 1, Section 8a, specifies that the ability to detect, quantify, and adequately respond to unplanned releases of radioactive material to the environment rely on monitoring of environmental transport and diffusion conditions.

DOE 5400.5, Chapter 11, Section 6.b(1), requires the use of updated meteorological information that is appropriate to evaluate actual and potential doses in the environs of DOE facilities.

A DOE guidance document, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance (DOE/EH-0173T), recommends that each DOE facility establish meteorological monitoring programs that are "appropriate to the activities at the site, the topographical characteristics of the site, and the distance to the critical receptors" (Section 4.0).

The guidance document also recommends that offsite meteorological data be representative of the conditions at the DOE facility (Chapter I, Section 1.c).

The guidance document further recommends the consideration of the distances from the facility to points of public access when evaluating the need for supplementary meteorological information. If data from a single meteorological station cannot adequately represent atmospheric conditions for transport and diffusion conditions, supplementary information is required (Chapter IV, Section 9).

Finding

SNL, Albuquerque, does not have a meteorological program that supports environmental monitoring activities and that complies with DOE Orders 5400.1 and 5400.5, 40 CFR 61 Subpart H, and guidance contained in DOE/EH-0173T.

Discussion

Currently, meteorological data from Albuquerque International Airport is used by SNL, Albuquerque, to support its environmental programs. These data may be acceptable for the main Technical Areas, but there is insufficient evidence that these data are representative and acceptable for the remote areas. Many of these remote areas are 10 kilometers or more from the airport. Some of them differ in elevation by 1,000 feet or more from the airport. Additional topographical factors are the mountains and arroyos, which may cause local channeling of winds and other similar effects (R-201, R-202, R-203).

The use of unrepresentative meteorological data can cause dose assessments for activities at remote areas to be inaccurate and inappropriate for compliance with DOE and regulatory requirements.

This finding was identified in the PTTSA Report as Finding SF-CA-05. The ES&H Action Plan states that this deficiency will be corrected by December 15, 1993, which may not support remote area tests scheduled in the interim (I-R-240), and will not meet the required implementation date of November 9, 1991.

FINDING A/CF-7:**Gasoline Delivery to Technical Area III and
Coyote Test Field Gasoline Tanks****Performance Objective**

DOE 5400.1, General Environmental Protection Program, Section 5.a, states that it is DOE policy to conduct the Department's operations in compliance with the letter and spirit of applicable environmental statutes, regulations, and standards.

Albuquerque/Bernalillo County Air Quality Control Board (ABC/AQCB), Regulation 11.04, states that a transportable container of gasoline shall be sealed to prevent the loss of gasoline liquids or vapors or the entrance of ambient air into the container when transporting or unloading gasoline into any underground storage tank having a capacity greater than 3,000 gallons. ABC/AQCB, Regulation 11.04C, states that no person unloading gasoline from a transportable container into an underground storage tank of greater than 3,000 gallons capacity shall cause or allow the flow of gasoline through the product connecting hose until a return vapor recovery hose is attached and properly connected and sealed.

Finding

SNL, Albuquerque, is allowing gasoline to be delivered to Technical Area III and Coyote Test Field gasoline tanks without the use of vapor recovery systems, thus causing gasoline vapors to be displaced into the atmosphere.

Discussion

The intent of the local regulation is to prevent or reduce emissions of hydrocarbon vapors from local facilities to minimize the formation of photochemical oxidants in the atmosphere. The tanks in Technical Area III (10,000-gallon capacity) and at the Coyote Test Field (6,000-gallon capacity) are not equipped with vapor recovery systems (I-A-39). As a consequence, gasoline vapors are being displaced to the atmosphere when the gasoline is being transferred to the storage tanks.

This issue was not addressed in the PTTSA Report or in the ES&H Action Plan.

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FINDING A/CF-8:**Permitting of Soil Disturbance at Construction Projects****Performance Objective**

Albuquerque/Bernalillo County Air Quality Control Board (ABC/AQCB), Regulation 8.03.1, states that if more than three-fourths of an acre of land is disturbed as part of a construction project, then a permit must be obtained.

ABC/AQCB, Regulation 8.03.2, states that the permittee shall use the means specified on the permit to prevent the escape of airborne particulate matter from the site.

ABC/AQCB, Regulation 8.03.3, states that the permittee shall provide a detailed statement of the control measures that will be utilized and the time period during which those measures will be used.

Finding

A program for review of construction projects while in the planning stage has not been fully implemented to ensure that the necessary permits are obtained prior to start of construction, and that the permit applications include sufficient information concerning planned control measures to prevent fugitive dust emissions.

Discussion

A number of construction projects are in progress, ranging from small excavations to major new facilities that will take several years to complete from the planning stage to the occupancy stage. The planning stage for a construction project includes a review of applicable standards and requirements. Necessary permits are then to be acquired for the various activities. Although this process has been formalized into an ES&H Processes Manual document which clearly outlines the steps that are necessary to obtain permits, the following deficiencies in the permitting process were noted during the Tiger Team Assessment:

1. A sewer construction project was in progress that involved considerably more than three-fourths of an acre of soil disturbance and was nearly complete. No permit-to-disturb top-soil had been obtained.
2. There were two additional ongoing projects (Internal Materials Research Lab (IMRL) and Weapons Production Primary Standards Laboratory (WPPSA)) for which permits had been obtained. However, the documents that were submitted to the county, including the statement of control measures, were not sufficiently detailed to ensure that adequate dust control would be achieved.
3. A Draft Final Environmental Assessment for the Explosives Component Facility (A-123), April 1991, states that "fugitive dust regulations do not apply because the ECF will be on Federal land."

Disturbance of more than three-fourths of an acre of top soil during this construction will require a permit-to-disturb and a detailed statement of control measures to be used.

This finding is not identified in the PTTSA Report or ES&H Action Plan.

FINDING A/CF-9:

Permits for Open Burning

Performance Objective

Albuquerque/Bernalillo County Air Quality Control Board (ABC/AQCB), Regulation 3.03, provides for open burning for specific purposes if a permit is obtained prior to ignition.

Open burning permits typically include conditions that constitute requirements that must be observed by the permit holder.

Finding

There is no sitewide procedure in place to ensure that Open Burn Permits are obtained for all open burning activities, and that the requirements of the permits, when received, are complied with.

Discussion

Although organizations that have a frequent need for Open Burn Permits, such as the Coyote Canyon Open Burn Facility, Division 7537, have a good understanding of Open Burn Permit requirements and have procedures in place to ensure that the requirements are complied with, such procedures do not exist on a sitewide basis. A draft sitewide procedure for obtaining Open Burn Permits has been prepared, but it has not received formal approval and has not been distributed.

Deficiencies were noted with respect to compliance with the ABC/AQCB open burning regulation and permit conditions. These are as follows:

- On occasion, because of the lack of a procedure for obtaining an open burning permit, experimental planning may overlook the need for a permit. In such cases, it is necessary for ES&H personnel to seek authorization from the Albuquerque Environmental Health Department on an emergency basis by telephone rather than through normal channels. As a result, no documentation of conditions or restrictions is available for the proposed burn. In the case of the Liquid Fuel Test Facility, an emergency permit was initially secured for an experiment. This permit applied only to a single event for which the 24-hour notification requirement was waived. Eventually, an Open Burn Permit to cover 100 burns (A-9) was obtained by ES&H personnel, however, the permit requirements were never made clear to the Program Manager who continued the experiments with approximately 100 burns. He was not aware of the Open Burn Permit requirements, did not have a copy of the permit in his possession, did not notify the Albuquerque Environmental Health Department, Air Pollution Control Division, 1 day in advance of the burns, and did not contact the City or County Fire Marshal for permission to "burn" on the days of proposed burnings.
- At the Light Initiated High Explosive Facility, the Open Burn Permit is referenced in the check-off procedure (A-94) for burns, but there is no specific reference that the Environmental Health Department, Air Pollution Control Division, must be notified 1 day

in advance of burns, or that the Fire Marshal should be called for permission on the day of the proposed burn.

This issue was not identified in the PTTSA Report and the ES&H the Action Plan.

FINDING A/CF-10:**Emergency Power Generators in Building 862****Performance Objective**

An Air Quality Permit (Number 150) issued to SNL, Albuquerque, by Albuquerque/Bernalillo County Air Quality Control Board (ABC/AQCB) in accord with Regulation 20.01, Authority-to-Construct, states that each of the four 600-kW generators at Building 862 "shall be operated only 4 hours per day and 12 days per year."

Finding

The emergency power generators at Building 862 are being operated in a manner that results in exceedances of the operating hours limitation, and the site does not have a formal procedure for the operation of the generators which assures that the permit limitations will not be exceeded.

Discussion

The maintenance schedule for each of the four 600-kW generators is to run each diesel generator for 4 hours on the first Wednesday of each month (I-A-123). This practice completely uses up all of the allowable operating hours specified in the permit. Consequently, any time the units actually come on during a power outage, which has happened briefly several times since the units were commissioned, the permit is being violated. In addition, the permit limitation on operating hours was exceeded 2 years ago when the units were operated continuously for 8 hours while a substation was down for repair (I-A-8).

A copy of the permit was not available at the facility, and the terms and conditions of the permit were not known to the personnel who operate the generators (I-A-116). Also, no formal procedure is available that prescribes operating requirements to avoid operations in excess of time limits.

This finding was not noted in the PTSA Report or the ES&H Action Plan.

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3.5.1.3 Best Management Practice Finding

FINDING A/BMPF-1: Uncontrolled Emissions

Performance Objective

It is a best management practice to minimize the amount of uncontrolled or fugitive emissions that may be released to the atmosphere. To achieve this goal, facility equipment should be evaluated to ensure that practices used are best suited to limit uncontrolled emissions, and that standard operating procedures (SOPs) are in place to limit such emissions.

Finding

There are no sitewide SOPs in place to minimize uncontrolled and fugitive emissions.

Discussion

During the Tiger Team assessment, examples of equipment that had the potential for fugitive emissions were identified. There were no sitewide SOPs that applied to the following units:

- A number of vapor degreaser units were noted. These ranged in size from the 165-gallon trichloroethane unit in the Plating Shop to a state-of-the-art terpene unit at the Process Development Laboratory. There were no sitewide SOPs for using the vapor degreasers that would serve to minimize solvent emissions from these units. Each division had developed its own document. At the Glass Lab, there was no procedure present for its vapor degreaser. As a consequence, excessive emissions of solvent vapors can be released to the atmosphere.
- In the case of periodic inspection of fuel dispensing equipment to prevent fugitive emissions, there were no written procedures. At the SNL, Albuquerque, motor pool, there is a weekly walk-through of the facility to observe valves and operations for leaks and degradation in equipment. However, this inspection is not formalized in any written SOPs and the particular equipment to be inspected is not called out on a checklist with any standards of performance. Moreover, the weekly walk-through can be bypassed in the event of more pressing activities.

The finding was not identified in the PTTSA Report or the ES&H Action Plan.

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3.5.2 Surface Water

3.5.2.1 Overview

The surface water portion of the environmental assessment at SNL, Albuquerque, focused on a review of compliance issues related to regulations based on the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), the New Mexico Water Quality Act, and on best management practices in these areas. In addition to the Federal regulations and DOE Orders relevant to these areas, the review included New Mexico Water Quality Control Commission Regulations, and the City of Albuquerque Sewer Use and Wastewater Control Ordinance. A list of the applicable regulations, requirements, and guidelines is presented in Table 3-4.

The following issues were examined through interviews and review of documents:

- spill prevention, including the Spill Prevention Control and Countermeasure (SPCC) Plan, spill contingency plan, inspection, and training in spill prevention and control;
- discharges to the publicly owned treatment works (POTW), including the permitting process, compliance with regulations, pretreatment facilities, compliance orders, monitoring, analysis, and reporting;
- National Pollutant Discharge Elimination System (NPDES) permitting requirements;
- actual/potential discharges to sanitary sewers, septic tanks, and storm sewers;
- inventory, inspection, and maintenance of backflow prevention devices; and
- adequacy and integrity of the water distribution, and sanitary and storm sewer systems.

Programs related to issues covered under the surface water area are divided among a number of different divisions within Department 3220. The sanitary sewer program, including permitting, monitoring, and sampling is handled by individuals in Division 3221, with sampling and analytical support being supplied by a contractor. Personnel in Division 3221 also handle issues related to septic tank systems and discharges to the ground. Issues related to the Spill Prevention Control and Countermeasure Plan and the storm sewers are addressed by Division 3223. Drinking water issues and the potable water program are the primary responsibility of Industrial Hygiene (Division 3211). All of these divisions interact with the ES&H coordinators and line personnel, as appropriate to their activities.

A range of weaknesses in the surface water area was found in several of the programs at SNL, Albuquerque. A program for backflow prevention devices is just beginning with the assistance of contractor personnel; the overall program has not yet been formalized and documented. The site does not have a formal program to eliminate and prevent cross connections; activities in this area have only been in reaction to issues or problems. The program to respond

TABLE 3-4
LIST OF APPLICABLE SURFACE WATER
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
20 CFR 1910	Occupational Safety and Health Standards	OSHA
40 CFR 110	Discharge of Oil	EPA
40 CFR 112	Oil Pollution Prevention	EPA
40 CFR 121	State Certification of Activities Requiring a Federal License or Permit	EPA
40 CFR 122	EPA Administered Permit Programs: National Pollutant Discharge Elimination System	EPA
40 CFR 125	Criteria and Standards for the National Pollutant Discharge Elimination System	EPA
40 CFR 129	Toxic Pollutant Effluent Standards	EPA
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants	EPA
40 CFR 141	National Primary Drinking Water Regulations	EPA
Title 74, Article 6	New Mexico Water Quality Control Commission Regulations	State of New Mexico, EID
Chapter VII Article IX	City of Albuquerque Sewer Use and Wastewater Control Ordinance	City of Albuquerque Public Works Dept.
DOE 4330.4A	Maintenance Management Program	DOE
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5480.19	Conduct of Operations Requirements for DOE Facilities	DOE
DOE 5480.4	Environmental Protection, Safety, and Health Protection Standards	DOE
DOE 6430.1A	General Design Criteria	DOE

to complaints regarding drinking water quality issues does not have a method to document the remedial action nor to provide information to indicate that the action resulted in correcting the identified problem.

Maintenance of the water distribution system, and sanitary and storm sewers occurs primarily in reaction to problems/issues rather than on a routine/preventive basis. Despite repeated recommendations from contractors, SNL, Albuquerque, has not developed and implemented a comprehensive program to inspect and maintain these systems. The only active maintenance program in this area is one to inspect and maintain the valves in the water distribution system. A unique part of this program is a computer program to track and document the activities, and in so doing, to provide additional information for identifying problems before they become major issues.

Three significant weaknesses were identified in programs related to spill prevention, control, and cleanup. The first weakness is the lack of feedback mechanisms to ensure that line personnel are aware of their responsibilities in the area of spill prevention and that they have developed and implemented appropriate programs. Secondly, while the SPCC Plan defines an inspection program, including model forms and a description of their use, the effectiveness of the forms and instructions has not been validated. Additionally, there is no plan in place to train line personnel, who will be responsible for the inspections in the procedures and use of the forms. Thirdly, there are currently no programs to train employees in the prevention and mitigation of spills. Weaknesses were also noted in the area of secondary containment.

Policies, procedures, and training related to discharges to groundwater and sewers were noted to be weak or missing. Personnel were found to be familiar with policies but were uncertain as to how to implement them. No training programs or portions of curricula could be identified which would inform/instruct employees on policies and procedures related to discharges to groundwater and sewers, and their responsibilities and activities in regards to these areas.

The sanitary sewer discharge program has shown improvement since 1987. Documentation and reporting have been standardized, and are more complete and comprehensive than in past years. Some additional work is needed in the area of document review, monitoring of compliance issues, and ensuring that the regulations are being consistently met by the users.

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3.5.2.2 Compliance Findings

FINDING SW/CF-1: Backflow Prevention Device and Cross Connection Programs

Performance Objective

DOE 6430.1A, General Design Criteria, Section 0266-2, requires that the "quality of domestic water within distribution systems be protected from degradation by installation of backflow prevention assemblies to preclude backflow of contaminants or pollutants into the system."

29 CFR 1910.141(b)(2)(ii) also requires that water systems that carry nonpotable water shall be constructed in such a way as to prevent backflow or back siphonage into potable water systems.

DOE 6430.1A requires the elimination and prevention of cross connections.

Finding

There is no formal program to inventory, test, and maintain the backflow prevention devices located throughout SNL, Albuquerque, nor to identify and eliminate, or prevent cross-connections.

Discussion

While personnel in Division 7816 have recognized that a problem exists with backflow preventers and cross-connections and have taken initial steps towards remedying the problem, they have yet to formalize the programs. Such formalization would include defining the program, specifying the responsibilities of the different groups involved, and formalizing the notification and reporting procedures.

In the fall of 1990, personnel in Division 7816 obtained subcontractor support to develop an inventory of backflow prevention devices through a visual inspection of each building. As backflow prevention devices are identified throughout SNL, Albuquerque, the contractor personnel, who are certified specialists in cross-connection control, are required to test the device according to standard protocols. If the device fails the test, the contractor is to immediately remedy the problem through the appropriate methods and retest the device to ensure satisfactory operation. Upon completion of a satisfactory test, the device is tagged and inventoried.

The contractor is also in the process of identifying locations (12 as of late April 1991 (I-SW-54)) where backflow preventers are required but not installed (e.g., foam fire suppression systems). Building maintenance personnel, who, according to the person in charge of the activity, will receive training in the inspection and maintenance of backflow prevention devices and then will be certified to conduct these activities, will also be asked to assist in the identification effort.

Although the individual responsible for the activity described the proposed program and plan during the interview (I-SW-43), no formal program documentation has been prepared. The only documentation currently available is the inventory and inspection form completed by the contractor as part of the identification, testing, and maintenance activity (SW-7).

In 1985, an appraisal of the Environmental Health Programs (SW-93) recommended that SNL, Albuquerque, "develop and document a cross-connection identification and elimination program." Subsequent to this, a contractor performed an inspection to include the identification of cross-connections (SW-83). Those cross-connections identified were subsequently corrected (I-SW-150). In addition, while the site has construction specifications relative to cross-connections, there still is no formal, documented program to ensure that any additional cross-connections that may be identified are corrected, and to ensure that such cross-connections do not occur in future construction activities.

In a recent survey by the same contractor (SW-91), an issue of cross-connections was identified in regards to Kirtland Well 10, intended for use in fire fighting, and the water distribution system. The well is used as a groundwater monitoring station. Current plans call for construction of a new facility on the site and either capping or abandonment of the well. Pumping records indicate that no water has been pumped from the well since December 1988.

The lack of a backflow prevention device and cross-connection programs can also impact on the quality of the drinking water at the facility. Industrial Hygiene, as part of the Potable Water Program (SW-95), responds to employee complaints regarding drinking water, including taste, odor, and color. The Industrial Hygiene technician records information on the complaint (e.g., who called, location, and issue), and then investigates the problem, including sampling the water for analysis as appropriate. Without the backflow prevention device and cross-connection programs, the technician cannot determine if such a problem may contribute to or be the cause of the finding. If a problem is found after the investigation and analysis, the technician makes a recommendation as to how the problem should be corrected. Significant issues result in the water source being immediately posted and arrangements made for removal/replacement of the equipment. All of these activities are appropriately documented and the recommendation is reviewed and approved by an industrial hygienist (SW-34). Industrial Hygiene then works with the appropriate division to institute the corrective action. However, there is no system in place to document that the action is taken, nor when completed, that the action did indeed correct the identified problem. Such documentation would represent closure of the incident reporting/investigation/remediation process.

This finding was not identified in the 1987 Environmental Survey, the PT TSA Report, or the ES&H Action Plan.

FINDING SW/CF-2:**Spill Prevention Control and Countermeasures****Performance Objective**

40 CFR 112 provides requirements for a Spill Prevention Control and Countermeasure (SPCC) Plan. The regulation sets forth the guidelines for preparation of the document (40 CFR 112.7) and the requirements for training of personnel in spill prevention (40 CFR 112.7(e)(10)).

40 CFR 112.7(b) states that: "Where experience indicates a reasonable potential for equipment failure (such as tank overflow, rupture, or leakage), the plan should include a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each major type of failure."

Finding

The SPCC Plan prepared by SNL, Albuquerque, does not contain all of the sections specified in 40 CFR 112.7, nor is there an SPCC training program as required in the regulation.

Discussion

1. The SPCC Plan contains information on directions of flow and a range of quantities for potential spills from each item (e.g., aboveground tank, ground-level transformer) in each major area of the facility (e.g., Technical Area I); however, no information on flow rate is provided. In addition, the plan contains information on directions of flows in Section 3.0, and equipment descriptions and quantities in Section 4.0, making it difficult for the reader to evaluate this particular issue.
2. The SPCC Plan does not contain a statement that address any potential for equipment failure that would result in oil spills (SW-1).
3. Based on interviews with personnel responsible for training (I-SW-134), there are currently no training programs in spill prevention. Two courses are under development: Spill Awareness; and Spill Control and Mitigation. In addition the SPCC Plan contains a schedule that specifies several milestones for the development and implementation of training programs. Two of these milestones have been missed; one milestone was 2 months overdue and the other was 1 month overdue as of May 1991.
4. Several key control and feedback features are missing in the implementation of the SPCC Plan. The SPCC Plan is distributed to key individuals throughout the line organizations; however, there is no mechanism to ensure that these individuals are aware of all of the provisions of the plan and that they recognize what their responsibilities are in relationship to the implementation of the plan. There is also no provision for line organizations to provide the personnel responsible for the SPCC Plan with information relative to implementation of the various facets of the plan, including the

inspection program specified in the SPCC Plan and required by the regulation.

Issues related to the inspection program were identified as part of the groundwater findings in the PTTSA Report and were included in the ES&H Action Plan.

FINDING SW/CF-3:**Secondary Containment****Performance Objective**

40 CFR 112.7 requires that facilities storing bulk quantities of oil develop a Spill Prevention Control and Countermeasures (SPCC) Plan. As part of this plan, 40 CFR 112.7 requires that facilities ensure that appropriate containment and/or diversionary structures or equipment will be provided to prevent discharged oil from reaching a navigable waterway.

Finding

SNL, Albuquerque, does not have a program to ensure that secondary containment is appropriately located, inspected, and maintained so as to ensure that discharged oil could not reach a navigable waterway.

Discussion

The SPCC Plan (SW-1) for SNL, Albuquerque, identifies all of the oil storage tanks, oil-containing transformers (except those mounted on poles), and other oil-containing equipment that is located on SNL, Albuquerque, property and describes the presence or absence of secondary containment. A significant number of oil storage facilities or oil-containing equipment have not been provided with secondary containment (12 of 39 oil storage tanks, 390 of 544 transformers, and 14 of 100 other pieces of oil-containing equipment do not have secondary containment). For those items without secondary containment, a priority has been assigned indicating the need for secondary containment and the time frame within which secondary containment will be provided.

Additionally, while the SPCC Plan specifies a program of inspection, including model forms, that is to be carried out by the line personnel responsible for the equipment, there is no plan to train personnel in the inspection technique nor have the forms and written descriptions been pretested to determine if they are appropriate (I-SW-4). In addition, this is not sufficiently formalized or detailed to ensure that inspections are properly conducted. The plan requires inspections to be conducted annually with reports submitted to the SPCC Task Leader within 7 days of the inspection; however, no inspection reports have been submitted since approval of the plan in February 1991.

A Tiger Team inspection tour was conducted of a sample of oil-containing items. This tour included an inspection of a sample of all types of items, both with and without containment. During this tour, the following problems were noted:

- One of four oil storage tanks at the tank farm had leaking valves; these are located within secondary containment.
- Trash and debris had accumulated in outdoor secondary containment areas, resulting in a compromise to the secondary containment area (noted adjacent to Building 893 and at Substation 890).

- There is a secondary containment area for a transformer at Building 859 that had a drain pipe going through the barrier and into the storm sewer that was not capped when inspected on April 18, 1991; a cap was in place when the Technical Accuracy Review occurred on May 16, 1991.
- Oil-containing parts extend beyond the secondary containment area at the New Aerial Cable Site.
- Oil and chemicals are being stored in close proximity to a road leading to the New Aerial Cable Site. This poses a risk that the secondary containment could be damaged by motor vehicles and allow spill runoff to a nearby stormwater runoff ditch.
- A temporary transformer located close to the Microelectronics Development Laboratory had neither secondary containment nor a liner on the ground. Site policy requires that all temporary transformers be provided with lined secondary containment (I-SW-25).
- A sump to receive stormwater and water discharges, some of which may be oil-contaminated, from buildings in Technical Area IV is located within a secondary containment area for oil storage tanks. This compromises the actual volume of the secondary containment area for those tanks.
- In Technical Area III, there are berms surrounding oil-containing equipment that are not properly maintained. As an example, one area of a berm was breached to ground level.

In terms of providing secondary containment, the site is working on the higher priority sites, and at the time of the interview (approximately 2 months into the program), were still on schedule according to the time line presented in the SPCC Plan (I-SW-4).

The PTTSA Report and the ES&H Action Plan both contain references to secondary containment as a groundwater issue in a finding on the SPCC Plan; however, the specific issues of this finding were not addressed.

FINDING SW/CF-4:

Program to Monitor and Maintain the Water Distribution, and Sanitary and Storm Water Systems

Performance Objective

DOE 4330.4A.11, Maintenance Management Program, requires DOE contractors to develop, implement, and document a program to ensure that maintenance activities are conducted to preserve the reliability of systems important for safe and reliable operation.

DOE 6430.1A, Part 0262, General Design Criteria, specifies the construction standards for water distribution, and sanitary and storm sewer systems. Once built, these systems should continue to meet the specified standards.

DOE 5400.1, General Environmental Protection Program, defines what facilities must do to protect the environment, including adherence to all appropriate regulations.

Finding

SNL, Albuquerque, does not have a fully developed, documented, and implemented program to inspect, monitor, and maintain the water distribution, and sanitary and storm sewer systems.

Discussion

The past and present approach taken by Division 7845 regarding the monitoring and maintenance of water distribution, and sanitary and stormwater systems can best be characterized as reactive. In the past several years, personnel have initiated various studies of the different systems throughout SNL, Albuquerque, (SW-81 through SW-85). These studies have been primarily in response to an identified problem or as preparation for upcoming design and development activities.

The reports contain findings related to corroded and leaking sewer pipes, insufficient capacity in older sections of the storm sewer, and erosion of catch basins. Several of the reports (SW-81 through SW-85) noted the need for a maintenance program as well as for making specific recommendations of corrective actions and future development. For the earlier studies, the site has completed the corrective actions, the majority of which involved construction projects (I-SW-150). Recommendations from the more recent studies are either still under review or have been incorporated into planned construction.

The only routine maintenance program currently in place is for inspecting and maintaining valves in the water distribution system on a semiannual basis. The activities are tracked and documented by a computer program; however, neither the activities nor the computer program are documented (I-SW-133).

The lack of a formal maintenance program for these systems could result in undesirable or prohibited releases to the environment.

These specific concerns were not identified in the PTTSA Report or the ES&H Action Plan.

FINDING SW/CF-5:

Policies, Procedures, and Training Related to Discharges to Ground and Sewers

Performance Objective

The State of New Mexico Water Quality Control Commission Regulations, Part 3-106, specify requirements for filing and receipt of Notices of Intent to Discharge water to the ground.

The City of Albuquerque Sewer Use and Wastewater Control Ordinance, Part 8-9-4 C, and permits issued to the facility for discharges to a publicly owned treatment works (POTW), require SNL, Albuquerque, to meet specified discharge parameters and to notify the City of Albuquerque if changes in processes will significantly alter the discharges from the facility to POTW.

DOE 5480.19, Conduct of Operations, requires that control of operating activities to achieve environmental goals be accomplished through written standards. DOE 5480.19(4) requires that the conduct of operations at DOE facilities be managed with an auditable set of requirements, standards, and responsibilities.

SNL, Albuquerque, policy number MN471001 requires notification of Division 3221 personnel when process changes are planned that will impact on water discharges or when water is planned to be discharged to the ground. This policy also covers the disposal of chemicals to drains.

Finding

SNL, Albuquerque, does not have procedures in place to implement policies relating to discharges to sewers, requirements for compliance with permit conditions, and water-related environmental issues, nor does it provide comprehensive and effective training to personnel regarding policies and procedures.

Discussion

SNL, Albuquerque, has documented policies in place to provide guidance related to water discharges and to ensure compliance with regulations, permits, etc. However, without appropriate procedures and personnel training regarding all aspects related to implementing the policy, it is not possible to ensure that employees fully understand the intent of the policy and how it is to be implemented.

During tours of 26 buildings/facilities throughout SNL, Albuquerque, and interviews with facility personnel, the Tiger Team noted issues regarding the interpretation and implementation of policies in two areas related to water discharges:

- policy regarding the types and quantities of chemicals that may be disposed of down drains to both the sanitary sewer and septic systems; and

- policy regarding discharges of water to the ground.

These policies are designed to enable the site to meet the permit requirements and the regulations, thus avoiding exceedances and noncompliance with regulations.

During interviews of personnel involved in processes likely to impact on discharges to the POTW (I-SW-7 through I-SW-9, and I-SW-98 through I-SW-101), a high level of awareness was noted. However, there is no formal procedure for submitting appropriate prior notification to Division 3221 concerning the proposed changes.

Current SNL, Albuquerque, policy is that no more than 100 mL of any chemical on a specified list of chemicals may be disposed of down an individual drain during a single day. Almost all of the personnel interviewed were familiar with the policy, but were unclear as to how it was to be implemented. For example, logs of chemicals disposed of down drains were maintained in some laboratories, while in other laboratories, personnel just "kept track mentally" of what was disposed of down the drain. Other personnel were unclear as to whether the new guidelines that will soon become effective precluded them from disposing of rinsate to drains (I-SW-103 through I-SW-105, I-SW-114, and I-SW-115).

In terms of discharges to the ground, two cases were identified where the individuals notified Division 3221 of the intent to discharge, but were not aware that the discharge should not have occurred until they had received appropriate documentation, i.e., that verbal notification without followup documentation was not sufficient (I-SW-68). The two discharges that occurred did not violate regulations of the State of New Mexico because the analyses showed that the contaminants were below the specified levels and, therefore, the discharges were exempt from the regulation. The SNL, Albuquerque, policy states only that notifications are required. Without a procedure and training that outlines the entire process, Division 3221 cannot be ensured that the policy is correctly implemented.

Issues related to communication of policy, understanding by line personnel, and documentation were addressed in broad terms in the management controls section of the PTTSA Report and the ES&H Action Plan. Training issues were also cited in broad, general terms. Deficiencies contained in this finding that were identified in the PTTSA Report and ES&H Action Plan include the process for notifying Division 3221 of process changes, and the process to ensure that Division 3221 approves discharges to ground. The other specific issues were not addressed in these documents.

3.5.2.3 Best Management Practice Finding

FINDING SW/BMPF-1: Publicly Owned Treatment Works Permits and Reporting

Performance Objective

It is a best management practice to have a process in place to review submissions to regulatory agencies for completeness, appropriateness, and compliance.

Finding

SNL, Albuquerque, does not have a program to ensure that all documents submitted to the City of Albuquerque Public Works Department regarding discharges to publicly owned treatment works (POTW) are complete and appropriate and that requirements of the permits are uniformly implemented.

Discussion

In reviewing renewal applications for the POTW permits and the quarterly monitoring reports required by the permits, the following issues were identified:

1. Deficiencies noted in the renewal application for POTW wastewater discharge permits include:
 - Lack of information on the type (batch, continuous, none) of specified discharges in Section 1.303 of the renewal application for POTW Permit 2069-A.
 - Absence of the applicable Standard Industrial Classification (SIC) codes entered in Section 1.106 of the application for the 14th Street sewer; however, the final permit included the SIC codes (SW-5).
 - The renewal application for POTW Permit 2069-G was signed for the authorized representative by another person; there is no documentation available to demonstrate that the authorized representative had given signatory authority to the individual who actually signed the renewal application.
2. An emergency telephone number was not prominently posted at the wastewater monitoring station in the basement of the Process Development Laboratory. The telephone numbers, required by the ordinance, were attached to the permit posted at the station. All other stations have both the list of telephone numbers as well as a prominent posting.
3. In reviewing the wastewater monitoring reports submitted to the City of Albuquerque (SW-73), no explanations for large variations in daily flow-meter readings were provided. In several cases, one or more weekday flow rates were noted by the Tiger Team to be outside two

standard deviations of the mean for the month. No explanation nor acknowledgement of these flow rates was provided. In addition, inclusion of these values in the calculation of the average could skew the results.

Record reviews encompassed the period from January 1988 to the present. These issues indicate the lack of a program to review documents submitted to ensure that all necessary documentation related to filings is maintained, and to ensure that requirements of the permits are implemented consistently throughout the facility. Significant improvement in reporting and documentation was noted since August 1990 when responsibility for the program was assumed by a new individual. None of these issues were identified in the PTSA Report or the ES&H Action Plan.

3.5.3 Groundwater/Soil

3.5.3.1 Overview

The groundwater/soil portion of the Environmental Subteam assessment at SNL, Albuquerque, involved an evaluation of the groundwater monitoring program and current groundwater and soil/sediment/biota-related characterization activities. The assessment included tours of inactive waste disposal sites, observation of well sampling, review of site documents, and interviews with SNL, Albuquerque, KAO, and New Mexico Health and Environment Department personnel. Compliance with groundwater requirements was evaluated on the basis of DOE Orders and Federal and New Mexico regulations. Table 3-5 lists the applicable regulations and DOE Orders used in this assessment.

Fully assessing the groundwater conditions at SNL, Albuquerque, is a complex task because of a variety of site-specific conditions. The site encompasses about 10,000 acres, some of which is noncontiguous and is interwoven with other DOE facilities and Kirtland Air Force Base. SNL, Albuquerque, began operations in 1946. Over the ensuing years, diverse operations have been conducted that had the potential to affect the environment. Furthermore, the SNL, Albuquerque, site is geologically complex considering the mountain ranges, extensive geologic faulting, and highly variable stratigraphy that blanket the site. The depth to groundwater on the eastern portion of the site is about 50 feet below land surface and steepens to 400 feet below the western half. Most of the change in water elevation occurs across a fault which transects the site from north to south. Given the steep changes in water level occurring near faults, the presence of springs, erratic water level fluctuations in some wells, high groundwater production flow rates in the vicinity of SNL, Albuquerque, and steep vertical groundwater gradients, characterizing the hydrology of the site is challenging. As a first effort in characterization, wells were installed in 1985 as part of a groundwater monitoring program for the chemical waste landfill.

SNL, Albuquerque, currently has 18 monitoring wells and has plans to install up to 5 more wells in 1991. The site also shares data with adjacent well owners, including Kirtland Air Force Base, DOE's Inhalation Toxicology Research Laboratory, the City of Albuquerque Public Works Department, and the United States Geological Survey. In total, regional groundwater characterization is based on approximately 30 wells.

Groundwater monitoring at SNL, Albuquerque, is conducted by the Environmental Restoration Department (ER) of the Environmental Impact and Restoration Division. Monitoring is performed at the chemical waste landfill (a RCRA-regulated facility) on a quarterly basis and is conducted throughout the Kirtland Air Force Base by SNL at least once a year. Groundwater sampling and the laboratory analyses on groundwater samples are conducted by contractors.

Groundwater in the SNL, Albuquerque, area is utilized as a sole source of potable water for the city of Albuquerque and, therefore, any contamination of groundwater resources receives extreme scrutiny. Most of the groundwater production wells in the vicinity of SNL, Albuquerque, area are operated by the Kirtland Air Force Base (10 wells), upon which the SNL, Albuquerque, site is situated. The city of Albuquerque also has water supply

TABLE 3-5
LIST OF APPLICABLE GROUNDWATER/SOIL
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan	EPA
40 CFR 264 and 265	Standards and Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	EPA
OSWER Directive 9950.1	RCRA Groundwater Monitoring Technical Enforcement Guidance Document Guidance for Conducting Remedial	EPA
OSWER Directive 9950.3	Operation and Maintenance Inspection Guide (RCRA) Groundwater Monitoring Systems	EPA
OSWER Directive 9355.3-01	Investigations and Feasibility Studies Under CERCLA	EPA
OSWER Directive 9283.1-2	Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites	EPA
OSWER Directive 9502.00-6D	RCRA Facility Investigation (RFI) Guidance	EPA
DOE 5400.1	General Environmental Protection Program	EPA
DOE 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Requirements	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
NMED	Monitoring Well Construction and Abandonment Policy	NMED

wells and some are located within 2 miles of SNL, Albuquerque. Additionally SNL, Albuquerque, on an infrequent water supply backup basis, also operates a single water supply well and a production well for firefighting purposes.

Groundwater contamination is known to exist at the SNL, Albuquerque, chemical waste landfill and is also suspected elsewhere on the site. Groundwater contamination at this landfill is currently being addressed through implementation of a Corrective Action Plan (CAP) issued by the New Mexico Environment Department. Contamination was first detected in March 1990, when trichloroethylene (TCE) levels of 5 ppb were detected. Later analyses of groundwater quality at the landfill have shown TCE levels up to 16 ppb and trichloroethane, methylene chloride, and acetone have also been detected. It should be noted that site personnel believe that the methylene chloride and acetone readings are from laboratory contamination of the samples.

SNL, Albuquerque, has identified over 150 environmental restoration sites, including past burial sites, septic discharge systems, chemical spill sites, and underground storage tank locations. Groundwater quality data are generally not available for these sites; however, some soil/sediment/biota sampling has been conducted in these areas.

Current groundwater and soil-related work at SNL, Albuquerque, includes preliminary characterization of several environmental restoration areas, site investigation at the mixed waste and chemical waste landfills, and further characterization of groundwater movement and quality at the mixed waste landfill. Additionally, SNL, Albuquerque, is in the midst of completing a regional groundwater elevation and water-quality study. Soil, sediment, and biota samples are collected yearly as part of an environmental surveillance program and the number of sampling sites has steadily increased over the years.

The groundwater/soil assessment identified four compliance findings and one best management practice finding. The compliance findings include the absence of a sitewide hydrogeologic assessment and monitoring well network; deficiencies in groundwater sampling and analysis; an incomplete Groundwater Protection Management Program Plan (GPMPP); and an incomplete program of environmental surveillance of radiological and nonradiological constituents. The best management practice finding relates to inappropriate closure and protection of wells and boreholes.

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3.5.3.2 Compliance Findings

FINDING GW/CF-1: Sitewide Hydrogeological Monitoring Well Network

Performance Objective

Both the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and implementing regulations promulgated as part of the National Contingency Plan (NCP) at 40 CFR 300.430 contain guidelines for contamination assessments that state that groundwater regimes should be adequately characterized to understand flow path, source verification of contaminants, and other hydrogeologic features.

DOE Order 5400.4, CERCLA Requirements, states that DOE shall respond to inactive waste sites in accordance with CERCLA and NCP regardless of whether the facility is listed on the National Priorities List.

DOE Order 5400.1, General Environmental Protection Program, Chapter III, Section 4.a, requires that a Groundwater Protection Management Program Plan (GPMPP) be completed by May 1990. Elements of GPMPP include documentation of the groundwater regime with respect to quantity and quality, design and implementation of a monitoring program, a management program for groundwater protection and remediation, a summary of areas that may be contaminated, strategies for controlling sources of these contaminants, a remedial action program that is part of the site CERCLA or Resource Conservation Recovery Act program, and decontamination and decommissioning and other remedial programs contained in DOE directives. Chapter IV, Section 9, requires that a Groundwater Monitoring Plan be developed as a specific element of the groundwater protection management program by November 1991. The Groundwater Monitoring Plan must address regulations and requirements applicable to groundwater protection and monitoring sampling strategies, sampling and analysis plans, and data management.

Finding

SNL, Albuquerque's, groundwater monitoring well network and degree of groundwater quality characterization will not be extensive enough to be able to characterize the impact of DOE operations on the site by November 1991.

Discussion

The existing well network at SNL, Albuquerque, is not adequate to determine groundwater conditions onsite. This weakness has been recognized by SNL, Albuquerque, and KAO. The following deficiencies have been identified:

1. A remedial site characterization at the chemical waste landfill has not been completed. This will be conducted as part of a corrective action plan with the New Mexico Environment Department.
2. The number and placement of wells at the mixed waste landfill is not sufficient to characterize the effect of the mixed waste landfill on groundwater.
3. In Technical Area II, there are no wells to inspect for groundwater contamination that may have occurred due to prior septic system

discharges, and no geophysical investigation at prior disposal sites have been conducted.

4. There is no well at Technical Area V to monitor for potential contamination of groundwater caused by the liquid waste disposal system.
5. Wells have not been installed along the major geologic fault onsite to determine the effect of the fault on groundwater flow.
6. There is no two-dimensional groundwater model for the site to assist in the placement of monitoring wells.

Corrective actions are fully funded and currently are in the planning stage. Additional deficiencies that have been identified, but not funded are:

1. Water levels in groundwater production wells in the vicinity of SNL, Albuquerque, have not been measured regularly, and the extent of the area of influence for these wells have not been determined.
2. Groundwater contaminant parameters at non-environmental restoration wells have not been measured to more fully determine which contaminants are coming onsite and to extend the coverage of the groundwater quality program.
3. The integrity of wastewater piping at SNL, Albuquerque, and its potential for significant leakages has not been fully assessed to determine if significant amounts of contaminated sewer water is reaching the water table.
4. Groundwater data that could be available from other sources (e.g., Inhalation Toxicology Research Institute and City of Albuquerque monitoring and production well water level data, and water level measurements at the SNL Coyote Canyon Burnsite Well) has not been collected regularly.
5. Neither a specific timetable nor prioritization for accomplishing the identified tasks in the "Technical Plan for Further Hydrogeologic Characterization of the KAFB Region," which are necessary for completing the sitewide hydrogeologic assessment, have been set (GW-19).
6. The program for sitewide hydrogeologic characterization is not yet completed, as noted by the fact that the 95 percent confidence level statistical methodology has not yet been applied to any of the sites at SNL, Albuquerque, whereas the slated goal of the program is to assess all sites in this manner.

The PTTSA Report and the ES&H Action Plan noted those items that the site already has funded.

FINDING GW/CF-2:**Radiological and Nonradiological Environmental Surveillance Program****Performance Objective**

DOE Order 5400.1, General Environmental Protection Program, Chapter IV, Section 3, requires pre-operational monitoring. Chapter IV, Section 6.b.1, requires that environmental surveillance be conducted to monitor the effects, if any, on onsite and offsite environmental and natural resources. Environmental surveillance shall be designed to satisfy the following program objectives: verify compliance with laws and regulations; verify compliance with environmental commitments; characterize and define trends in environmental media; establish baselines of environmental quality; continually assess pollution abatement programs; and identify and quantify new or existing environmental problems. Section 6.b.2 requires that environmental surveillance programs reflect facility characteristics. Chapter IV, Section 2, states that the requirements of DOE Order 5820.2A apply.

DOE 5484.1, Environmental Protection, Safety and Health Protection Information Reporting Requirements, Chapters II through IV, extend the scope of the environmental surveillance program to include nonradiological monitoring and outline programs for environmental compliance assessment, environmental program management, groundwater protection program, and quality assurance information.

Finding

The SNL, Albuquerque, radiological and nonradiological environmental surveillance program is not being implemented under a formal, well-defined program and does not include sufficient sampling and analysis to meet the requirements of DOE Order 5400.1.

Discussion

The current surveillance program does not meet the requirements of DOE Order 5400.1. Although the program is to be upgraded when the Environmental Monitoring Plan is implemented, this will not occur within the time frame required by DOE Order 5400.1 (see Finding RAD/CF-5). SNL, Albuquerque, has also developed program plans (R-59) and initiated actions to develop a formal program (R-43). The following specific deficiencies were identified:

1. Not all aspects of the program have been formally defined or implemented through procedures. Some procedures exist (R-44, R-45, and R-58); however, they only address scattered topics and together do not fully define the conduct of operations for program implementation. Some areas not covered by procedures are documentation of review of environmental data, lower limits of detection, action levels, anomalous measurement investigations, and report preparation.
2. The existing surveillance program is justified solely on a historical basis. There is no documented design criteria, justification, nor program basis for the existing program. There are no provisions to periodically review the program design against current operations to determine if it needs to be modified. The basis of the existing

surveillance program does not include low-level waste storage, treatment, and disposal facilities as required by DOE Order 5820.2A.

3. Although SNL, Albuquerque, has quality assurance plans, there are no procedures to ensure that quality assurance requirements are implemented for routine program operations, sampling, and laboratory analysis.
4. The ES&H Manual (R-20) provides guidance and requirements for notifying the Environmental Programs Department (3220) of facility operational and physical changes that may impact the program. Procedures for implementing these requirements have not been established, a quality assurance program has not been implemented to measure compliance, and there are no procedures to ensure that this information is used to modify the environmental surveillance program.
5. There are no formal mechanisms to identify the need for, nor to perform, pre-operational monitoring. There are several ongoing and planned construction activities (e.g., SDF, RMWMF, and IWMC), but none are undergoing formal pre-operational monitoring. There is limited monitoring, such as direct radiation measurement, soil sampling, and vegetation sampling; however, such monitoring is not conducted under a formal plan and it does not meet all of the requirements of DOE Order 5400.1.
6. The current program involves annual sampling of surface water, vegetation, and soil, and quarterly direct radiation measurements. The sampling frequency, types of constituents analyzed, and the number of locations for some media are not adequate to characterize the effect of SNL, Albuquerque, operations on onsite and offsite environmental resources. All environmental release pathways have not been evaluated to determine if they require monitoring. Some examples are ambient air (see Finding A/CF-5), surface water runoff, storm drain discharges, and tritium from the Technical Area III classified, mixed, and low-level waste landfill.
7. Not all known areas of elevated soil contamination are sampled and evaluated as part of the environmental surveillance program.
8. Additional surveillance activities that could be considered include food crops in the vicinity of SNL, Albuquerque. Food crops may possess different bioaccumulation rates than the grasses and Russian thistle currently being sampled.
9. No wildlife such as snakes, birds, gophers, or rabbits that inhabit the SNL, Albuquerque, area are sampled to investigate the potential effects of bioaccumulation.
10. Results of sampling tasks from successive years are not trend analyzed or well-displayed to allow for rapid assimilation of the sampling results.

Some aspects of this finding were covered in the PTTSA Report and the ES&H Action Plan, including the need to develop a sampling and analysis rationale, the need for more frequent sampling, additional sampling locations, and pre-operational monitoring for new or proposed facilities.

FINDING GW/CF-3:**Groundwater Sampling and Analysis****Performance Objective**

SNL, Albuquerque, Chemical Waste Landfill Sampling and Analysis Plan (final draft since February 5, 1990) specifies the procedures to be used in conducting groundwater sampling and analysis at the chemical waste landfill (I-GW-18).

40 CFR 265.90 (a) states that regulated waste disposal unit owners or operators must implement a groundwater monitoring program capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility.

40 CFR 265.92 (a) states that owners or operators of Resource Conservation and Recovery Act (RCRA) facilities must obtain and analyze samples from the installed groundwater monitoring system. The owner or operator must also develop and follow a groundwater sampling and analysis plan which includes procedures for sample collection, sample preservation and shipment, analytical procedures, and chain-of-custody control.

DOE Order 5400.1, Attachment IV-1, provides as groundwater monitoring standards, the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD) (OSWER Directive 9950.1) and the RCRA Comprehensive Groundwater Monitoring Evaluation Document (OWSER Directive 9950.2).

Specific criteria for evaluating RCRA groundwater assessment programs at hazardous waste facilities are specified in TEGD. The TEGD was published by EPA as guidance because the regulations do not outline detailed requirements for conducting groundwater assessments. The TEGD includes criteria regarding site characterization, and monitoring and sampling, and it is frequently cited within Notices of Deficiencies and Notices of Violations for hazardous waste TSD facilities.

Finding

SNL, Albuquerque's, field implementation of the Chemical Waste Landfill Sampling and Analysis Plan, while sampling groundwater at the chemical and mixed waste landfills, does not always conform to the requirements specified in the plan.

Discussion

The Environmental Subteam noted the following deficiencies in comparing the SNL, Albuquerque, Chemical Waste Landfill Sampling and Analysis Plan and the documented record of groundwater field sampling at the chemical waste landfill in May 1990:

1. The field sample collection log does not include records of the results of organic vapor monitoring and groundwater sample collection rates.
2. The environmental chain-of-custody form used in the field is different from the one presented in the SNL, Albuquerque, plan.

3. Groundwater elevations recorded in the field at the mixed waste and chemical waste landfills are not adjusted to reflect stretching of the electronic probe cable as described in the SNL, Albuquerque, Plan.

In comparing the SNL, Albuquerque, Sampling and Analysis Plan and observed groundwater sampling and analysis conducted at the mixed waste landfill on April 29, 1991, the following discrepancies were noted:

1. Groundwater elevation measurements, used to calculate well purge volumes and hydraulic gradient at MW-2 were taken on April 17, 1991 rather than on the day of purging and sampling (April 29, 1991).
2. The Chemical Waste Landfill Sampling and Analysis Plan does not specifically indicate that it is the procedure to be used for collecting samples at the mixed waste landfill although it is the one followed.

SNL, Albuquerque, has worked with the State of New Mexico Environment Department (NMED) since 1987 to develop a Sampling and Analysis Plan. Multiple versions of the Plan have existed, the latest version which is dated February 5, 1990, and comments from NMED are incorporated into the Plan as they are received.

The Chemical Waste Landfill Sampling and Analysis Plan for groundwater does not contain all the elements recommended in the EPA TEGD. A best management practice would be to incorporate the TEGD-recommended elements into the Sampling and Analysis Plan. The following differences were noted in the SNL, Albuquerque, Plan:

1. The plan does not specify that nondedicated sampling equipment is to be disassembled prior to decontamination.
2. The plan does not specify that a 0.45-micron-size mesh filter will be used for collecting dissolved analyte samples.
3. The plan list of information to be collected in the field logbook does not specify that wells should be identified as high or low yield or that all sampling team members be identified.
4. The plan chain-of-custody form does not have an explicit blank for the sample collector's signature.
5. Specific entry blocks are not provided for information on decontamination methods, descriptions of immiscible phase sample collection and assessment, equipment malfunctions, and calibration. However, these data were entered under a form block titled "comments." Although the Plan does not require that this information be provided in a specific format, it would be beneficial to have separate entry blocks for these data to ensure they are not accidentally omitted.

Another best management practice would be for SNL, Albuquerque, to correct groundwater elevation measurements to account for the deviation from straight (plumb) of the monitoring well. Due to the great depth to groundwater, approximately 450 feet, it is appropriate to correct groundwater elevations

measured with the electronic probe to account for borehole curvature (reportedly these data are available), otherwise erroneous groundwater gradients could be determined. Based on the reported required accuracy for the borehole construction (1 degree of curvature per 100 feet of drilling), this deviation could account for about 7 hundredths foot of error in calculating water table elevation. Groundwater elevation levels, for comparison, at different wells around the mixed waste landfill vary by about 3 hundredths of a foot between wells.

None of these issues were covered in the PTTSA Report or the ES&H Action Plan.

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FINDING GW/CF-4:**Groundwater Protection Management Program Plan****Performance Objective**

DOE Order 5400.1, General Environmental Protection Program, Chapter III, Section 4.a, requires that a Groundwater Protection Management Program Plan (GPMPP) be completed by May 1990. Elements of GPMPP include documentation of the groundwater regime with respect to quantity and quality; design and implementation of a monitoring program; a management program for groundwater protection and remediation; a summary of areas that may be contaminated; strategies for controlling sources of these contaminants; a remedial action program that is part of the site Comprehensive Environmental Response, Compensation, and Liability Act or Resource Conservation Recovery Act program; and decontamination and decommissioning and other remedial programs contained in DOE directives.

Finding

The SNL, Albuquerque, Groundwater Protection Management Program Plan does not meet the requirements of DOE Order 5400.1.

Discussion

The following groundwater plan deficiencies were noted:

- Groundwater monitoring unrelated to Environmental Restoration is not assigned a priority in GPMPP (GW-5).
- There is no stated relationship between the Environmental Restoration and other groundwater programs within GPMPP.
- The stated goal for the sitewide hydrogeologic characterization is to achieve a 95 percent confidence level in determining groundwater flow paths. However, the referenced document that describes how this goal will be accomplished is specific to the RCRA chemical waste landfill and it is not clear how the 95 percent confidence level will be adopted to the sitewide study.
- No specific schedule has been established for evaluating the groundwater program's performance in meeting its goal of a 95 percent certainty in characterizing groundwater quality and flow.
- There is no description of the ongoing academic training other than safety training that is expected for new and existing employees to further the goals of the groundwater program.

The PTTSA Report and the ES&H Action Plan noted that the GPMPP was not available and as a result a plan was written; however, the elements identified in this finding were not addressed in the plan.

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3.5.3.3 Best Management Practice Findings

FINDING GW/BMPF-1: Closure and Protection of Wells and Boreholes

Performance Objective

The State of New Mexico has issued suggested procedures to be used for plugging and abandonment of monitoring wells. Use of these procedures is mandatory for all wells installed after January 1, 1990.

The 1986 Resource Conservation and Recovery (RCRA) Groundwater Monitoring Technical Enforcement Guidance Document (TEGD) states that monitoring well seals should have a permeability that is one to two orders of magnitude less than the surrounding geologic formation. TEGD also states that to obtain depth-discrete water quality data, monitoring well screen lengths should be short, otherwise excessive dilution and vertical cross-contamination could occur. Concrete or steel bumper guards should also be placed around a well to prevent external damage by a vehicular collision with the exposed casing, and locking caps should be placed on wells to prevent tampering and groundwater contamination. Finally, TEGD states that when wells are no longer operable, or give false groundwater analytical data, they should be decommissioned and sealed.

DOE Order 5400.1, General Environmental Protection Program, Attachment IV-1, provides as groundwater monitoring standards, the RCRA Groundwater Monitoring Technical Enforcement Guidance Document (OSWER Directive 9950.1) and the RCRA Comprehensive Groundwater Monitoring Evaluation Document (OSWER Directive 9950.2).

RCRA 40 CFR 265.91(c) states that all RCRA monitoring wells must be cased in a manner that maintains integrity of the monitoring well borehole. This includes proper well screening, sand-packing, and borehole sealing to prevent contamination of samples and the groundwater.

DOE Order 5400.1 policy statement requires that DOE minimize risks to the environment or public health, and anticipate and address potential environmental problems before they pose a threat to the quality of the environment or public welfare.

Finding

SNL, Albuquerque, does not have a system or procedure in place to ensure that wells and boreholes are adequately closed, sealed, and protected.

Discussion

Several wells pose an elevated risk of spreading vertical cross-contamination due to their long well screens, improper well sealants, and inoperable condition. Additionally, several SNL, Albuquerque, boreholes are not provided with locking caps or protection from vehicular traffic.

- Monitoring wells MW-1, MW-2, MW-3, BW-1, and BW-2 installed at the chemical waste landfill have well screen lengths of 105, 160, 110, 103, and 508 feet, respectively. Due to the long length of these well screens and their placement within the aquifer, these wells

were deemed unacceptable in 1988 by the New Mexico Environment Department for RCRA monitoring and new wells were installed with 20-foot-long well screens. The older wells, however, were never adequately closed or sealed. Should contaminants enter these older wells, they could spread along the full screened length of the well.

- Monitoring well CWL-BW2 and 8 boreholes at the mixed waste landfill were backfilled with natural soil from the site, which is of sandy composition, rather than with materials that are one to two orders of magnitude less permeable than the surrounding soil, such as bentonite or cement grout sealants. If contaminated materials were to enter these holes, they could preferentially traverse through the disturbed borehole sediments. SNL, Albuquerque, personnel believe that high permeability sealants rather than lower permeability sealants may be more appropriate for their site-specific conditions based on the semi-arid climate and because groundwater preferentially moves through fine-grained sediments in the unsaturated zone.
- In 1988, monitoring well MW-1 at the chemical waste landfill was inadvertently plugged with a bailer and tremie pipe during sampling and maintenance activities. This well has never been properly plugged and abandoned.
- SNL, Albuquerque, has not developed any procedures or criteria for judging when wells should be decommissioned or backfilled or in what manner they will be abandoned.
- Four open boreholes at the mixed waste landfill extend to a maximum depth of 150 feet and are expected to be used in the future for geophysical logging and possible soil gas monitoring, and therefore SNL, Albuquerque, does not wish to abandon the boreholes (I-GW-8). These boreholes are not provided with locking caps, but rather the standpipe openings are covered with plastic tape. The plastic tape covering will not hinder tampering with boreholes and is more subject to weathering and leaking than a locking cap, and therefore poses an increased risk of groundwater contamination. These same boreholes are not provided with steel posts or protective curbing to prevent vehicular impact, which could result in the shearing-off of stand pipes and permanent disablement of the boreholes.

None of these issues were raised in the PTTSA Report or the ES&H Action Plan.

3.5.4 Waste Management

3.5.4.1 Overview

The waste management assessment involved the evaluation of waste-related activities for conformance with applicable State and Federal regulations and DOE Orders. These included the Resource Conservation and Recovery Act (RCRA); Hazardous and Solid Waste Amendment (HSWA); EPA Hazardous Waste Regulations (40 CFR 260 - 281) and Guidance; New Mexico Hazardous Waste Act (NMHWA); New Mexico Solid Waste Acts (NMSWA); New Mexico Solid Waste Management Regulations (NMSWMR); New Mexico Underground Storage Tank Regulations (NMUSTR); and DOE 5400.1, 5400.3, 5400.5, and 5820.2A. Table 3-6 lists applicable waste management regulations, requirements, and guidelines that were used during the conduct of this assessment.

The approach used in this assessment included: interviews with various personnel involved in overall SNL, Albuquerque, waste management, waste generators, and SNL, Albuquerque, contractors at the Hazardous Waste Management Facility (HWMF); inspection of waste generating activities, waste accumulation areas, the HWMF, the hazardous waste thermal treatment unit, and preparation of waste for offsite transportation; and review of relevant waste management documentation, including plans; written policies and manuals; written standard operating procedures for waste-related activities; permits and permit applications; correspondence with State and Federal regulators; inspection records; manifests and biennial reports; training records; and other relevant documentation.

Hazardous Waste Management at SNL, Albuquerque

The State of New Mexico has authority to regulate the basic hazardous waste program under RCRA, and the EPA Region VI has authority to regulate the Hazardous and Solid Waste Amendments portion of RCRA. Accordingly, the State has essentially adopted RCRA hazardous waste regulations at 40 CFR 260-270. SNL, Albuquerque, is currently operating under Interim Status Guidelines according to 40 CFR 265 and within the parameters described in the most recent Part A submission. The facility has also submitted five iterations of the Part B permit application, the most recent in April 1991, in response to a Notice of Deficiency from the State.

Hazardous waste management at SNL, Albuquerque, is coordinated through the contractor-run HWMF. This operation includes the transportation of waste from the generators to the HWMF, where hazardous waste is then characterized, segregated, repackaged for treatment or disposal at a TSDF, and stored pending transport offsite. Over half the waste generated at SNL, Albuquerque, is from laboratory-type operations. Because of the varied activities at SNL, Albuquerque, the facility generates a large variety of relatively small amounts of waste. Consequently, much of SNL, Albuquerque's, waste arrives at the HWMF in small containers which are laboratory-packed for transport to offsite treatment, storage and disposal facilities (TSDFs), where the wastes are either incinerated or disposed of in a RCRA-approved landfill.

The remaining volume of waste at SNL, Albuquerque, is process waste, which includes waste oils, spent solvents, wastewaters, and off-specification materials. These wastes are typically transported in 55-gallon drums to

TABLE 3-6
LIST OF APPLICABLE WASTE MANAGEMENT
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.3	Hazardous & Radioactive Mixed Waste Programs	DOE
DOE 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE 5820.2A	Radioactive Waste Management	DOE
40 CFR 261	Identification and Listing of Hazardous Waste	EPA
40 CFR 262	Standards Applicable to Generators of Hazardous Waste	EPA
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities	EPA
40 CFR 266	Standards for the Management of Specific Hazardous Waste Management Facilities	EPA
40 CFR 268	Land Disposal Restrictions	EPA
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program	EPA
NMSWA	New Mexico Solid Waste Acts	NMED
NMSWMR	New Mexico Hazardous Solid Waste Management Regulations	NMED
NMHWMR	New Mexico Hazardous Waste Management Regulations	NMED
NMUSTR	New Mexico Underground Storage Tank Regulations	NMED

offsite TSDFs for treatment (incineration) or disposal or are bulked for transport to a waste reclaimer. There is also a Thermal Treatment Unit (TTU) onsite, which treats explosive-containing waste by controlled burning. Residues and contaminated water from this treatment are then disposed of through the HWMF.

Division 3221 is charged with overall management of hazardous waste at SNL, Albuquerque. This includes development of plans and submission of permit applications, coordination of the HWMF and TTU, overseeing waste management by generators, training waste generators, and various other hazardous waste management activities. SNL, Albuquerque, designates almost all of its waste accumulation areas as satellite accumulation areas. Accordingly, SNL, Albuquerque, must aggressively transport waste from the generators to the HWMF. SNL, Albuquerque, has only one designated 90-day accumulation area for storage of explosive waste.

Mixed Waste

SNL, Albuquerque, generates a variety of mixed (hazardous and radioactive) waste. Additionally, there is quite a bit of legacy material that could be characterized as mixed waste.

SNL, Albuquerque, has submitted a Part A permit application for onsite storage of mixed waste at 34 separate sites. Additionally, mixed waste is stored at generator locations.

The storage area for mixed waste is located on top of an inactive mixed waste landfill, where waste is stored outside in containers. There is no enclosed storage facility at this location. SNL, Albuquerque, is in the process of constructing a radioactive and mixed waste management facility (RMWMF), but this facility will not be operational for some time.

Currently, SNL, Albuquerque, has not fully developed or implemented programs to ensure that management of mixed waste onsite is in compliance with all RCRA requirements. In addition to a lack of adequate facilities in which to store mixed waste, SNL, Albuquerque, has yet to develop and implement procedures to properly characterize the mixed waste or train personnel on proper handling requirements.

Mixed Waste at Manzano

The Manzano Area has seven bunkers that house radioactive and legacy materials which may be characterized as mixed waste. These materials have yet to be inventoried and characterized for hazardous constituents. Division 3222 has begun an effort to inventory the waste, but this task is far from completion.

The Security and Facility Support Directorate (3400) is the SNL, Albuquerque, division responsible for storage and transportation of the Manzano Area material. The radioactive and Mixed Waste Division (3222) has requested that Directorate 3400 notify them of any movement that might cause the Land Disposal Regulations (LDRs) to be applicable to previously exempt mixed waste materials. Directorate 3400 response to the Division 3222 request has not been sensitive nor responsive to RCRA requirements regarding storage. Directorate 3400 concerns are based on line organization needs and Health

Physics Division (3212) requirements and not on concerns with hazardous waste regulations.

Radioactive Waste

Radioactive waste issues are discussed in the Radiation Overview, Section 3.5.7.1.

Sanitary Waste

All sanitary and nonhazardous waste at SNL, Albuquerque, is disposed of at the Kirtland Air Force Base (KAFB) landfill. Generators of waste segregate chemical waste (which includes all potentially hazardous waste) from sanitary waste. SNL, Albuquerque, transports its own sanitary waste to the landfill and works closely with KAFB (through DOE/KAO) to ensure that only nonhazardous waste is disposed there.

Underground Storage Tank Program

The underground storage tank (UST) program is in a transitional phase at SNL, Albuquerque. In the past, SNL, Albuquerque relied solely on the State regulations for managing their USTs and were caught off-guard in a joint EPA and NMED UST inspection in July 1990, in which the EPA's more stringent tank upgrade requirements were applied to the site rather than the NMED regulations. As a result of the inspection findings, 23 USTs were either temporarily closed or removed from the ground within the next year. Consequently, SNL, Albuquerque, and DOE have not fully implemented a program for the management of underground storage tanks that will ensure compliance with all applicable UST regulations. The Tiger Team found that an UST spill reporting incident did not meet regulatory requirements.

Used Lead Program

SNL, Albuquerque, generates used lead, including lead hammers, lead shielding and lead shot. SNL, Albuquerque, has not developed a program to address the management of lead from acquisition to the eventual disposal or reuse of the lead. Such a program is important for determining whether or not the lead is radioactive. Additionally, about 20 tons of lead has been stored outside on pallets over bare soil which poses a risk of soil contamination through weathering processes and spills. Currently the 20 tons of lead is stored on bare soil in quonset huts that are not fully enclosed, and so it continues to pose a threat of soil contamination.

Classified Waste Management at SNL, Albuquerque

Classified waste represents a specific category of waste which must be controlled according to strict security guidelines. This added dimension creates unique problems in managing hazardous classified waste in conformance with all RCRA requirements. SNL, Albuquerque, does not have fully developed programs to inventory, characterize, store, declassify, treat, and finally dispose of hazardous classified waste. SNL, Albuquerque, is, however, aware of these deficiencies and has taken some steps to resolve the issues. Classified nonhazardous waste is currently disposed of onsite at an unpermitted and unregistered nonhazardous waste landfill that has several regulatory deficiencies.

Waste Minimization Program

SNL, Albuquerque, has completed a Waste Minimization and Pollution Prevention Awareness Plan which outlines a program to conduct waste minimization sitewide. Key elements of the program are the establishment of the MinNet program, selection of MinNet program representatives from the line organizations, and development of process waste assessments sitewide. Waste minimization has occurred at some organizations, but has been initiated by specific individuals rather than as part of a sitewide program.

Summary of Findings

Compliance findings at SNL, Albuquerque, related to nonconformance with State and Federal regulatory requirements or inadequate assurance of compliance. These findings included: improper management of satellite and 90-day accumulation areas; deficient waste characterization; deficiencies in the UST program storage at HWMF; inadequate inspection of TTU; deficiencies in the hazardous waste training for generators; undeveloped program for the management of classified waste; unregistered classified waste landfill; lack of a coordinated program to ensure proper disposal of sanitary waste; undeveloped waste minimization program; and deficiencies in waste manifests.

Best management practice (BMP) findings relate to nonconformance with practices which are not regulatory or DOE required, but are a recommended policy. BMP findings related to the inadequate evaluation of offsite treatment, storage, and disposal facilities and a lack of a coordinated program to ensure adequate development and submission of RCRA permit applications.

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3.5.4.2 Compliance Findings

FINDING WM/CF-1: Sanitary and Nonhazardous Waste

Performance Objective

Section 34(B)(5) of the New Mexico Solid Waste Act imposes strict liability for remedial costs on any person who, by agreement, arranged for transportation or disposal of their solid waste to a solid waste facility.

40 CFR 262.11 requires that solid waste generators determine whether their waste is a listed hazardous waste under 40 CFR 261, Subpart D. If the waste is not a listed waste, the generator must then determine whether the waste is identified in 40 CFR 261, Subpart C, by either testing the waste according to the specified methods, or by applying knowledge of the hazard characteristic of the materials used in the process or materials used in generating the waste.

Finding

There is no formal coordination within SNL, Albuquerque, to manage sanitary and nonhazardous waste to ensure that hazardous waste is not improperly disposed of as sanitary waste.

Discussion

There is no formal coordination between the environmental managers at SNL, Albuquerque, and the operators charged with the task of disposal of sanitary waste. While the Environmental Subteam did not observe any specific instances of hazardous waste being inadvertently disposed of as sanitary waste, there are no formal controls in place to ensure proper segregation before disposal. The controls that do exist are the result of informal individual initiatives, and consequently could become ineffective if priorities or personnel were to change.

The following specific deficiencies were noted in the management of sanitary waste:

- There are no approved standard operating procedures available to transportation and solid waste operators to ensure that hazardous waste is not disposed of as sanitary waste. There are, however, draft standard operating procedures for this purpose, which appear to have been put into place while awaiting approval, as well as an informal system of inspection by the janitors, the drivers hauling and dumping the waste, spot checks at the landfill by Division 3221, and inspection by KAFB Landfill personnel (I-WM-111, I-WM-112, and I-WM-113).
- The ES&H Manual provides guidance to the line organizations concerning the segregation of chemical waste, although formal training in hazardous waste guidelines has not been given to all generators.
- There is no formal program to train custodial and transportation personnel to recognize hazardous waste disposed of with the

sanitary waste. Some custodial staff have been through the hazardous waste training for generators, but not as part of a systematic training program for those personnel (I-WM-111, I-WM-112, and I-WM-113).

This finding was not identified in the PTTSA Report, but was partially addressed by the ES&H Action Plan.

FINDING WM/CF-2:

Used Lead Program

Performance Objective

40 CFR 261.1(c)(8) defines "accumulated speculatively" as a material that is accumulated before being recycled and is not at least 75 percent recycled by the end of a calendar year.

40 CFR 261.2(c)(4) states that materials which are speculatively accumulated are considered solid wastes.

40 CFR 261.3(a) defines a "hazardous waste" as a solid waste that is not excluded from the definition of hazardous waste and is characteristically hazardous (40 CFR 261, Subpart C), a listed hazardous waste (40 CFR 261, Subpart D) or a mixed hazardous waste (40 CFR 261.3(a)).

40 CFR 262.11 requires that generators of solid wastes determine whether the solid waste is hazardous.

DOE 5820.2A, Radioactive Waste Management, requires that "low-level waste shall be characterized with sufficient accuracy to permit proper segregation, treatment, storage, and disposal. This characterization shall ensure that, upon generation and after processing, the actual physical and chemical characteristics and major radionuclide content are recorded and known during all stages of the waste management process" (Chapter III, Section 3.d.1).

40 CFR 122, National Pollutant Discharge Elimination System; and 40 CFR 131, Water Quality Standards, prohibit the degradation of surface water quality. To comply with the intent of these requirements, it is necessary to take steps for the positive control of hazardous substances to prevent any leaks or spills from reaching a pathway to a surface water source. Such controls might include the use of secondary containment or the storage of materials in a protected area removed from the weather surface drainage.

DOE 5400.1, General Environmental Protection Program, in the environmental policy statement, requires DOE to minimize risks to the environment and to conduct its operations in an environmentally safe and sound manner.

Finding

SNL, Albuquerque, does not have a fully developed program which ensures the proper characterization, storage, treatment, or reclamation of used lead generated from its operations and ensures that storage of the used lead will not result in contamination of the soil on which the lead was or is stored.

Discussion

In a review of the management of used lead by SNL, Albuquerque, the Tiger Team noted the following:

- Approximately 20 tons of used lead is in storage at the reapplication yard where it has been kept for about one and one-half calendar years (since December 1989) (I-GW-37). None of this lead has been characterized, disposed, reclaimed, or

reapplied within SNL, Albuquerque, indicating that the storage of the lead meets the definition of speculative accumulation.

- SNL, Albuquerque, has not fully developed a program to track or manage lead from the time it enters the facility until its eventual disposal or reuse. Such a program is necessary to ascertain whether or not the lead has become radioactively contaminated in the course of its use. Radioactively contaminated lead could potentially be subject to mixed waste rules depending on whether it is disposed or reused. Six weeks ago, an SNL, Albuquerque, staff person in the Mixed Waste Division was assigned the task of developing a program for managing used lead; however, a program has not yet been fully formulated (I-GW-39).
- The 20 tons of used lead that is currently in the reapplication yard was historically stored on pallets over a gravel base and was not protected from weather. Such storage conditions do not protect the surrounding environment from precipitation runoff that may directly leach lead from the scrap, nor from lead particle emissions that may occur as the result of sand abrasion of the lead during high winds. During the Tiger Team Assessment, the lead was moved into two quonset huts. The huts, however, are open on one side and have bare earth floors, and thus are not adequate to ensure that soil contamination will not occur. The Environmental Subteam further noted that spilled lead shot was directly on the ground within one quonset hut (I-GW-37).

This finding was not identified in either the PTTSA Report or ES&H Action Plan.

FINDING WM/CF-3:

Waste Characterization

Performance Objective

40 CFR 262.11 requires that solid waste generators determine whether their waste is a listed hazardous waste under 40 CFR 261, Subpart D. If the waste is not a listed waste, the generator must then determine whether the waste is identified in 40 CFR 261, Subpart C, by either testing the waste according to specified methods, or by applying knowledge of the hazard characteristic of the materials based on the process or materials used in generating the waste.

40 CFR 265.13 requires that owners and operators of Interim Status treatment, storage, and disposal facilities (TSDFs) develop and follow a Waste Analysis Plan which describes the procedures that will be used to obtain a detailed chemical and physical analysis of a representative sample of the waste before it is treated, stored, or disposed. The Waste Analysis Plan must describe characterization of all wastes to ensure compliance with the land disposal restrictions promulgated at 40 CFR 268.

Finding

The SNL, Albuquerque's, waste characterization program does not ensure that hazardous wastes are correctly identified and characterized.

Discussion

The following deficiencies were noted in the characterization of waste at SNL, Albuquerque:

1. SNL, Albuquerque, does not have a formal sitewide system in place to document the hazard characteristics of waste materials through knowledge of the processes or materials used in generating the individual line organizations' wastes. Generators provide information of their waste when they submit a Chemical Waste Disposal Request for transportation of the waste to the Hazardous Waste Management Facility (HWMF). The Chemical Waste Disposal Request is designed to provide certain information that will aid the HWMF in characterizing the waste in accordance with RCRA requirements, but it does not describe the processes by which the waste was generated, nor does it describe the hazard characteristics of the waste. The HWMF will inquire into the knowledge of process only where there is some question as to the identity or characterization of the waste after they cross-reference it through their own waste profile tracking system, or analyze it for hazard characteristics (I-WM-142 and I-WM-143).
2. The HWMF does not have a system to ensure that all waste entering the facility is properly characterized in a timely manner. For instance, several drums of waste oil, contaminated soil, and other unknown waste have yet to be characterized. Dates on those drums range from June 22, 1988, to August 13, 1990 (I-WM-5 and I-WM-141).
3. Procedures are not in place to ensure that waste oils are adequately characterized. Examples of deficiencies include the following:

- a. There are no finalized procedures for analyzing waste oils (I-GW-33).
 - b. The waste profile sheets for waste oil shipments to OSCO and ENSCO are incomplete. Twenty-eight drums of waste oil, prepared for shipment, contained materials in waste codes D023, D025, D040, or D008. These waste codes were not shown on the treatment, storage, or disposal waste profile (I-GW-33).
4. The Waste Analysis Plan does not include a detailed description of the test method used to determine whether the waste exhibits the toxicity characteristic under 40 CFR 261.24. The plan also does not include test methods for determining whether the waste meets concentration based treatment standards under the land disposal restrictions in 40 CFR 268.
5. Rocket engine casings and excess rocket fuel expelled during testing have not been characterized, and may be improperly stored at the Rocket Sled in Technical Area III (WM-125).
6. There is no procedure to characterize excess explosives as waste at the time it is generated. The waste is characterized when it is transported to the 90-day accumulation area. Consequently, waste may be inappropriately managed at the point of generation (WM-96).
7. According to internal SNL, Albuquerque, policy, generators are expected to characterize all chemical waste as hazardous waste, and to manage the waste accordingly. This practice may result in potentially nonhazardous waste being characterized as hazardous waste, and disposal of hazardous waste under waste codes that are more stringent than necessary. As an example, solvent-contaminated rags are being disposed of as hazardous waste although they may not actually meet the definition of a hazardous waste, e.g., rags contaminated with 25 percent aqueous solution of isopropanol. The facility's rationale for this practice is the unwritten policy to manage waste in a very conservative manner.

This finding was not addressed in the PT TSA Report or the ES&H Action Plan.

FINDING WM/CF-4:**Mixed Waste Characterization****Performance Objective**

DOE 5820.2A, Radioactive Waste Management, requires that "low-level waste shall be characterized with sufficient accuracy to permit proper segregation, treatment, storage, and disposal. This characterization shall ensure that, upon generation and after processing, the actual physical and chemical characteristics and major radionuclide content are recorded and known during all stages of the waste management process" (Chapter III, Section 3.d.1).

DOE 5400.3, Hazardous and Radioactive Mixed Waste Programs, requires DOE to manage hazardous and radioactive mixed wastes according to the requirements of Subtitle C of the Resource Conservation and Recovery Act (RCRA) and the Atomic Energy Act, respectively.

40 CFR 262.11 requires that solid waste generators determine whether or not the waste is hazardous according to the requirements specified in 40 CFR 261.

40 CFR 265.13(a)(1), requires owners/operators of hazardous waste treatment, storage, and disposal facilities to obtain a detailed chemical and physical analysis of a representative sample of the wastes before treatment, storage, or disposal.

40 CFR 265.13(b), requires owners/operators of hazardous waste treatment, storage, and disposal facilities to develop and follow a written waste analysis plan that describes the procedures which will be followed to comply with 40 CFR 265.13(a) requirements.

40 CFR 268.7, Resource Conservation and Recovery Act (RCRA), requires that waste generators determine whether their waste is restricted from land disposal by actually testing the waste or by using knowledge of the waste. Waste that is determined to be subject to the land disposal restrictions may not be land disposed unless it meets specified treatment standards (40 CFR 268, Subpart D). 40 CFR 268.50 prohibits the storage of land disposal restricted waste unless storage is solely for the purpose of accumulating quantities necessary to facilitate the recovery, treatment, or disposal of the waste.

Finding

SNL, Albuquerque, does not have a program for mixed waste that is in compliance with the waste characterization requirements of DOE 5820.2A, DOE 5400.3, 40 CFR 262.11, 40 CFR 265.13, 40 CFR 268.7, and 40 CFR 268.50.

Discussion

SNL, Albuquerque, is not in compliance with the waste characterization requirements for both the radioactive and hazardous constituents of its mixed waste. Low-level radioactive constituents have not been characterized to permit adequate segregation and disposal. In addition, all historically generated mixed waste is being stored without adequate hazardous and radioactive constituent characterization (WM-81). Specific concerns that are indicative of programmatic weaknesses follow:

1. During inspections of various SNL, Albuquerque, facilities, mixed waste characterization was noted to be deficient (I-R-201 and IR-212 through IR-218) (WM-81). Declared waste, undeclared waste, and legacy material stored at Manzano Area is a particular problem for SNL, Albuquerque. Uncharacterized legacy waste and undeclared waste storage has resulted from researchers that have died or left the Laboratory before waste was characterized, from programs that have been terminated without waste materials being properly characterized, or from personal desires to retain waste materials for some undefined future use (I-R-201 and I-R-260). At this location, many improperly characterized waste containers were noted in bunkers 37063, 37055, 37118 and 37045 (I-R-201). It was noted by cognizant personnel that historically generated waste is being stored at numerous SNL, Albuquerque, facilities without proper characterization (I-R-201 and I-R-260).
2. At the Hot Cell Facility, numerous waste barrels were being used to accumulate mixed waste. Although the containers were properly labeled, records of the hazardous or radioactive materials in the barrels did not note the type and quantity of hazardous and radioactive constituents. The container records noted only the items and dates that they were placed in the barrels, which does not comply with DOE 5820.2A, Chapter III, 3.d(1); 40 CFR 265.13; and 40 CFR 262.11 (I-R-232).
3. The Radioactive and Mixed Waste Division does not conduct quality assurance oversight of the generators' waste characterization activities. Audits of the generators are not conducted, nor are random samples of wastes analyzed as quality control verification of the generators' data.
4. SNL, Albuquerque, does not have a qualified laboratory to analyze its mixed waste. Investigations and negotiations are currently underway to identify and establish a contract for a qualified mixed waste laboratory. The potential for constructing a laboratory is also being evaluated, but if approved, would not be operational for 5 to 7 years (WM-81).
5. A preliminary draft Waste Analysis Plan has been developed, which when implemented will meet the requirements for hazardous waste characterization in 40 CFR 262.11 and 40 CFR 265.13(b). This draft plan requires line organizations that generate mixed waste to characterize the waste either by testing in accordance with the methods set forth in 40 CFR 261, Subpart C, or by applying knowledge of the hazard characteristics of the waste based on the materials or generating process. However, this plan has not been approved by SNL, Albuquerque, management, and is not currently being used.
6. According to SNL, Albuquerque's Part A Permit Application for Mixed Waste Storage (WM-79), the site generates and stores wastes which are subject to the LDR including F-listed solvents. The site does not have a program to identify, segregate or treat the waste, nor does it have a program to determine whether the waste meets treatment standards under 40 CFR 268, Subpart D.

This finding was identified in the PTTSA Report (see Finding SF-RMW-03). The ES&H Action Plan has a schedule and budget which are responsive to the PTTSA Report finding.

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FINDING WM/CF-5:**Mixed Waste Storage****Performance Objective**

DOE 5820.2A, Radioactive Waste Management, requires that low-level waste that contains nonradioactive hazardous waste components (mixed waste) conform to the requirements of the Order and the Resource Conservation and Recovery Act (RCRA) (Chapter III, Section 2.d), specifies that low-level waste be stored by appropriate methods to achieve protection of the public health and safety (Chapter III, Section 2.a), and requires that records be maintained for all low-level waste that enters and leaves the storage facility (Chapter III, Section 3.h(2)).

DOE 5400.3, Hazardous and Radioactive Mixed Waste Program, states that "it is the policy of DOE to manage all Departmental hazardous and radioactive mixed wastes according to the requirements of Subtitle C of the Resource Conservation and Recovery Act, and the Atomic Energy Act, respectively" (Section 6.a).

40 CFR 265, RCRA, describes the requirements applicable to RCRA interim-status facilities for inspections, training, preparedness and prevention, arrangements with local authorities, contingency plan and emergency procedures, closure plans, and use and management of containers.

40 CFR 268 prohibits the land disposal of certain hazardous wastes unless those wastes meet specified treatment standards. 40 CFR 268.50 prohibits the storage of land disposal restricted (LDR) wastes unless storage is solely for the purpose of accumulating quantities necessary to facilitate proper recovery, treatment, or disposal.

At the time of the Tiger Team Assessment, mixed wastes that were subject to the land disposal restrictions were the following: spent solvent-containing wastes as of November 8, 1986 (40 CFR 268.30); dioxin-containing wastes as of November 8, 1986 (40 CFR 268.32); and California-list mixed wastes as of July 7, 1987 (40 CFR 268.32). Thus, such mixed wastes are currently subject to land disposal and storage restrictions. Mixed wastes containing a First Third, Second Third, or Third Third waste were granted a National Capacity Variance until May 8, 1992, and thus are not yet subject to treatment standards or storage restrictions (40 CFR 268.12(c) and 268.35(d)).

Finding

SNL, Albuquerque, does not have a formal program in place to ensure that mixed waste storage areas comply with DOE Orders and RCRA requirements.

Discussion

There are 34 interim status mixed waste storage areas at SNL, Albuquerque. Technical Area IV and the Remote Areas, however, do not have any interim status storage locations. Technical Area V has the largest number of storage areas, which are located in and around the Hot Cell Facility, the Sandia Pulsed Reactor, and in sheds, underground vaults, and storage yards. The following deficiencies are indicative of a lack of a coordinated mixed waste storage program:

1. SNL, Albuquerque, has not implemented the required inspection program for generator storage areas, with the exception of the Technical Area III Interim Storage Area (WM-81).
2. The Laboratory has completed the required RCRA training for Technical Area V personnel and for Jump Start personnel, but has not provided any courses for other generators. Annual reviews for the Technical Area V personnel have not been completed, and are approximately 6 months late. There is no formalized schedule to develop and implement Laboratory-wide required training, but the Laboratory recognizes the need for training (WM-81).
3. There is no program in place for preparedness and prevention at SNL, Albuquerque. This program is required by 40 CFR 265, Subpart C. The following interim status mixed waste storage areas did not have adequate maintenance and operation, required equipment for emergency notification, or required aisle space: Building 906 and an adjacent annex (inadequate maintenance and operation), Manzano Area Bunker 37045 (inadequate aisle space), Building 935 (no emergency notification equipment), the Technical Area III Radioactive and Mixed Waste Storage Area (no firefighting equipment), and the Technical Area V mixed waste storage building SC-1 (no emergency notification equipment).
4. There are no implemented contingency plans and emergency procedures for the mixed waste storage areas. These plans and procedures are required by RCRA, 40 CFR 265, Subpart D.
5. For historical wastes, SNL, Albuquerque, has not determined if it is in compliance with the incompatible waste storage requirements of 40 CFR 265.177c. Some of the historical waste stored at SNL, Albuquerque, may contain reactive material that may not be compatible with other materials stored nearby (WM-81).
6. According to SNL, Albuquerque's Part A Permit application (WM-79), mixed wastes that are subject to the LDRs, including listed spent solvent waste are being stored at the Site (WM-81). There is currently inadequate or no treatment capacity for mixed wastes. They are not being stored for the purpose of accumulating quantities necessary to facilitate proper recovery, treatment, or disposal, as specified in 40 CFR 268.50, and thus they are prohibited from storage.

The storage of mixed waste subject to LDRs is a DOE-wide problem. The problem will be further complicated in May 1992 when the current National Capacity Variance for first third, second third, and third third wastes expires.

The PTTSA Report noted the deficiencies for inspection, storage, and historical waste (SF-RMW-01, SF-RMW-03 and SF-RMW-04); however, the other concerns noted above were not specifically identified.

FINDING WM/CF-6:

Mixed Waste Inventory

Performance Objective

40 CFR 265.73, Resource Conservation and Recovery Act (RCRA), requires that the owner or operator of an Interim Status Treatment, Storage, and Disposal (TSD) facility keep a written operating record at the facility, which includes a description and the quantity of each hazardous waste received; the method(s) or date(s) of its treatment, storage, or disposal; and the location of each hazardous waste within the facility and quantity at each location.

DOE 5820.2A, Radioactive Waste Management, Chapter III, Paragraph 3.f requires that records be maintained for all low-level wastes that enter and leave a storage facility. Paragraph 3.m requires development of a record-keeping system that provides a historical record of waste generated, treated, stored, shipped, and/or disposed of at the waste facilities.

DOE 5400.3, Hazardous and Radioactive Mixed Waste Programs, requires DOE to manage mixed radioactive and hazardous wastes according to the requirements of Subtitle C of RCRA and the Atomic Energy Act.

Finding

SNL, Albuquerque, does not have a program in place to inventory and track mixed wastes such that accurate knowledge of the quantities, types, and locations of these wastes is available. This has led to an inventory that fails to include many mixed wastes and that cannot be used to locate or quantify mixed wastes onsite.

Discussion

The current SNL, Albuquerque, waste inventory does not include an accurate listing of all mixed wastes. Consequently, there are mixed wastes for which there is no written record, or any other means to demonstrate that they have been properly characterized, treated, stored, shipped, and/or disposed of at the waste facilities. The following examples demonstrate the lack of a coordinated, comprehensive inventory and tracking program:

1. There is no complete inventory of mixed wastes at the Manzano Area Bunkers. In addition, these wastes can be moved by the Security and Facility Support Division (3400) among the various bunkers without notification of the Radioactive and Mixed Waste Division (3222) of SNL, Albuquerque. This affects the accuracy of the present inventory (I-R-201 and I-R-260 through I-R-263). Division 3222 has requested that Directorate 3400 notify them of any movement that would invalidate the inventory. However the response (R-262) to this request demonstrates that Directorate 3400 is concerned primarily with security and accountability requirements, and line organization programmatic needs, rather than with environmental regulations. The response states that there is a "detailed, concise inventory of all nuclear materials owned and stored by SNL. There is no material, nuclear or otherwise, that is stored or withdrawn at SNL without meeting the proper guidelines and paper trail." It fails to recognize that an inventory of mixed waste is required by 40 CFR 265.73, since operating procedures and regulatory citations listed in the response do not include a reference to RCRA

requirements. There was no agreement in this response to notify Division 3222 of mixed waste movement in the Manzano Area, so the accuracy of the present inventory will continue to decline.

2. There are no inventories of mixed wastes located in various facilities, including Building 906 and its annex, Technical Area V (SC-1), Technical Area IV Transporter, and Building 819 (I-R-260).

Without accurate knowledge of the wastes in storage and their locations, SNL, Albuquerque, is unable to exercise the positive controls necessary to provide assurances that mixed wastes are being stored and handled in accordance with the applicable regulations. The Laboratory has plans to perform an inventory in Fiscal Years 1991 and 1992; the inventory was started on April 23, 1991, but to date this inventory has not been completed. The inventory procedure was reviewed by the Tiger Team. This procedure meets the inventory requirements of DOE 5820.2A and 40 CFR 265.73 (R-260).

This finding was identified in the PTTSA Report (S-RMW-03). The ES&H Action Plan identifies an aggressive schedule to complete this project.

FINDING WM/CF-7:**Hazardous Waste Management Facility****Performance Objective**

DOE 5400.1, General Environmental Protection Program, requires all DOE contractors to comply with the requirements for management of hazardous waste under the Resource Conservation & Recovery Act (RCRA) regulations.

40 CFR 265 describes the requirements applicable to treatment, storage, and disposal facilities (TSDFs) under RCRA, Part A, Interim Status. 40 CFR 265 includes specific requirements for security, inspections, management of containers, training of personnel, emergency procedures and recordkeeping.

40 CFR 265.14 requires that operators of TSDFs minimize the possibility for the unauthorized entry onto the active portion of the facility.

40 CFR 262.34 requires that generators label regulated waste as "hazardous waste" and label the accumulation start date.

40 CFR 265.171 requires that if a container holding hazardous waste is not in good condition, or if it begins to leak, the operator of the TSDF transfer the hazardous waste to a container that is in good condition.

40 CFR 265.177 requires that waste not be stored with or near incompatible waste or materials.

40 CFR 265.73 (2) requires that TSDF operators maintain an operating log of the location and quantity of waste within the waste storage facility.

40 CFR 265.35 requires that TSDF operators maintain aisle space to allow the unobstructed movement of personnel and emergency response equipment.

Finding

The Hazardous Waste Management Facility (HWMF) is not being managed in a manner that ensures compliance with RCRA interim status standards. Furthermore, SNL, Albuquerque, does not have a formal oversight program in place to ensure that contractor activities at the HWMF are in compliance with applicable requirements.

Discussion

The following deficiencies were noted in the operation of HWMF:

- 1) The one gate in the fence surrounding HWMF is typically left open and unattended during operation, and there is no other means to control entry through that gate (I-WM-5).
- 2) There is only one gate for entrance to and exit from the facility. This may restrict the evacuation of personnel from HWMF in the event of an emergency, as well as restrict the access of emergency personnel and equipment responding to the incident (40 CFR 265 51 Subpart A). This deficiency is particularly serious where the wind direction is towards the sole emergency exit (I-WM-5,

I-WM-22). There is, however, a construction contract in the procurement stage for the construction of an emergency "kick-out" gate (I-WM-154).

- 3) Lab packs were not labeled as hazardous waste immediately upon packaging, but were allowed to remain in storage unlabeled until transported offsite (40 CFR 262.34) (I-WM-5).

Five-gallon pails of hazardous wastes stored in the Flammable Solids Shed were not labeled as hazardous waste (40 CFR 262.31). Some containers were labeled with small inconspicuous hazardous waste labels, which did not provide easy identification of the waste (I-WM-5).

- 4) Empty wooden crates were being stored next to flammable wastes in the Flammable Solids Shed. Additionally, stacks of wooden pallets were stored next to the Flammable Solids Shed (40 CFR 265.177(c)) (I-WM-5).
- 5) Space between drums in the Oil Storage Area and Building 958 was not sufficient to allow unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment in the event of an emergency (40 CFR 265.35). This deficiency was observed in several storage bays and has also been identified in a Notice of Violation by State inspectors. Where drums are stored on pallets at HWMF in Building 958, the floor is marked to denote required aisle space between pallets. While the pallets were within the markings, the drums typically extended over each pallet by 6-8 inches, which substantially diminishes the amount of actual aisle space between waste drums (I-WM-5 and I-W-141).
- 6) During operation, HWMF occasionally stores drums outside the Storage Building for easier access while inspecting and labeling them in preparation for transportation. This outside area is not protected from vehicular traffic and presents the potential for accidents and potential contamination of surrounding environment. Outside storage may last up to an entire shift (8 hours), but the drums are returned to Storage Building at night according to site personnel (I-WM-141).
- 7) Drums in the hazardous waste storage building were observed to have substantial rust on top, bottoms, rims and seams; this consequently raises the question of container integrity. Additionally, some drums were observed to have an unknown liquid or liquid residue on top (I-WM-5 and I-W-141).
- 8) HWMF does not have approved standard operating procedures for handling and management of wastes.
- 9) HWMF does not have a formal procedure to ensure that land disposal restricted (LDR) wastes are stored, treated, and disposed in accordance with 40 CFR 268. However, a review of facility manifests and supporting documentation revealed that appropriate

LDR notifications and certifications accompany offsite shipments of hazardous waste (see Finding WM/CF-14).

- 10) HWMF does not have a formal system to track waste stored at the facility. Consequently, a particular waste container cannot be easily located within the facility, nor is there adequate assurance that all waste is removed to a licensed TSDF in a timely manner. In addition, there is no real-time inventory of waste at the facility to ensure that the storage capacity specified in the Part A permit is not exceeded (I-WM-33 and I-IWS-141).
- 11) SNL, Albuquerque, does not have a formal system to oversee its hazardous waste contractor who manages HWMF. Oversight is currently performed on an informal basis by the interaction of Division 3221 staff with the contractor and the HWMF.

This finding was not described in the PTTSA Report or ES&H Action Plan.

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FINDING WM/CF-8:

Satellite Accumulation

Performance Objective

40 CFR 262.34(c) states that generators of hazardous waste (including mixed waste) may accumulate up to 55 gallons of hazardous waste or 1 quart of acutely hazardous waste at "satellite accumulation" areas. Satellite accumulation areas must be at or near the point of generation and must be under the control of the operator of the process generating the waste. Hazardous waste being accumulated at a satellite accumulation area must be properly labeled and contained. Once waste accumulation in a satellite area reaches 55 gallons of hazardous waste or 1 quart of acutely hazardous waste, the generator must remove the waste within 3 days to an approved treatment, storage, and disposal facility or to a 90-day storage site.

DOE 5400.1, General Environmental Protection Program, requires all DOE contractors to comply with the requirements for hazardous waste management under the Resource Conservation and Recovery Act (RCRA) regulations.

SNL, Albuquerque, internal policy (WM-33) requires that all chemical waste, including chemical waste that is nonhazardous, be managed as hazardous waste and in compliance with the requirements for satellite accumulation areas described above. Present SNL, Albuquerque, policy requires that waste not be accumulated beyond 60 days before a Chemical Waste Disposal Request is submitted to Division 3221. Future policy, effective June 1, 1991, will require all waste accumulated in satellite accumulation areas to be removed from the point of generation within 60 days of the date accumulation initially began, regardless of whether the 55-gallon limit has been reached (WM-126). Although this new policy is not yet in effect, the Environmental Subteam observed several line organizations already following the new policy, which is currently recommended by Division 3221.

Finding

The SNL, Albuquerque, program for management of waste at satellite accumulation areas is not adequate to ensure that waste being accumulated in those areas is being managed in accordance with RCRA regulations.

Discussion

The SNL, Albuquerque, policies for management of hazardous waste among the line organizations are not implemented uniformly throughout the facility. The following deficiencies were noted:

- 1) Waste accumulation areas at several line organizations did not satisfy the requirements for either satellite accumulation under 40 CFR 262.34(c) or 90-day accumulation under 40 CFR 262.34(a). Although SNL, Albuquerque, has designated all waste accumulation areas at the line operations as satellite accumulation (I-WM-85 through I-WM-89), the Environmental Subteam observed several waste areas that were characteristic of 90-day accumulation areas. For example, in the back of Building 840 (I-WM-85 through I-WM-89), waste was being accumulated for the entire building operation. Also, wastes were being accumulated outside of Building 841 (I-WM-90 and I-WM-91) and the Assembly Building at the Solar

Research Facility (I-WM-134 through I-WM-137). SNL, Albuquerque, has designated these areas as satellite accumulation areas, but because they are not "at or near any point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste," they do not meet the RCRA definition of satellite accumulation areas and are therefore subject to the more strict requirements for 90-day accumulation areas. These requirements include, but are not limited to, weekly inspection and contingency plans.

- 2) Wastes at satellite accumulation areas were not being stored in accordance with regulatory requirements at 40 CFR 262.34(c).
 - a) Wastes in quantities exceeding 55 gallons may have been stored at satellite accumulation areas in excess of 3 days. For example, a 55-gallon drum designated as hazardous waste (floor stripping waste) was being stored outside the Assembly Building at the Solar Research Facility. The drum appeared full and had been stored from April 19, 1991, through May 3, 1991 (I-WM-134 through I-WM-137).

At other locations, quantities were difficult to determine because several areas had expired unused materials in their original containers designated as waste and in their original boxes. (This practice was prevalent in those areas where a "clean-out" of excess chemical supplies had occurred, such as at Building 867 and Building 887) (I-WM-76 through I-WM-84).
 - b) SNL, Albuquerque, may be misinterpreting whether the satellite accumulation volume limit refers to 55 gallons per waste stream or 55 total gallons of waste. SNL, Albuquerque, interpreted this rule to mean 55 gallons per waste stream, but discussions with State of New Mexico regulators confirmed that the State interprets this on a case-by-case basis, which does not necessarily ensure that SNL, Albuquerque's, interpretation is correct. The experience of the Environmental Subteam in various states and EPA regions has been that the limit applies to the total volume of wastes in the satellite accumulation area.
 - c) A Chemical Waste Disposal Report form was not submitted within 60 days after the start of accumulation of hazardous waste in accordance with SNL, Albuquerque, internal policy. For example, two waste containers at the Building 922 Explosive Laboratory were dated January 14, 1991, and January 27, 1991, respectively (waste quantities did not exceed 55 gallons) (I-WM-95 through I-WM-101).
- 3) Wastes were not labeled as required by 40 CFR 262.34(c)(1)(iii). Specific examples include:
 - a) A waste can for solvent rags did not have a hazardous waste label (Building 878, Division 7401, Room 1550) (I-WM-8 and I-WM-9).

- b) There was no hazardous waste labeling on most waste in the outside storage at Building 867. Unlabeled waste included lead bricks designated as waste, a mercury switch, fluorescent bulbs, lead acid batteries, and oil-based paint (I-WM-76 through I-WM-80).
 - c) Unused materials that had been declared waste, such as cans of paint and adhesives which were being accumulated outside the Paint Shop (Building 887), were individually labeled, but were stored in boxes that were not labeled (I-WM-81 through I-WM-84).
 - d) Boxes of various waste in the Machine Shop (Building 840) were being stored in paper boxes on pallets. There were no labels on the exterior boxes (I-WM-85 through I-WM-89).
 - e) Waste cans for solvent-contaminated rags in the Explosive Lab (Building 915) were mislabeled as oily waste (I-WM-95 through I-WM-101).
 - f) Waste labels were not marked with the date accumulation began to ensure that the SNL, Albuquerque, 60-day requirement would be met. As a specific example, Building 887 wastes being accumulated at the Carpenter/Millwright Shop, including a can of contact adhesive designated as hazardous waste, solder and acid waste, and cans of waste spray paint were not dated (I-WM-81 through I-WM-85).
- 4) Solvent- and oil-contaminated rags (nonsaturated) were being stored in plastic bags. This method of containment may not be sufficient under 40 CFR 265.172 and 173 to adequately contain the waste, and is not in accordance with best management practices. The Environmental Subteam observed this practice facility-wide.

This finding was not specifically noted in the PTTSA Report nor the ES&H Action Plan.

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FINDING WM/CF-9:**Classified Waste****Performance Objective**

40 CFR 262.11 states that a person who generates a solid waste must determine if that waste is a hazardous waste.

40 CFR 261, Subpart C, defines wastes that are hazardous by characteristic, and 40 CFR 261, Subpart D, lists specific hazardous wastes.

40 CFR 268 identifies hazardous wastes that are restricted from land disposal and treatment standards for those wastes. 40 CFR 268.7 states that a generator must determine if a waste is restricted from land disposal.

40 CFR 265.13(a) requires that before an operator of a treatment, storage, or disposal facility (TSDF) treats, stores, or disposes of any hazardous waste, or nonhazardous wastes, he must obtain a detailed chemical and physical analysis of a representative sample of the waste.

40 CFR 265.13(b) states that a TSDF operator must develop and follow a written waste analysis plan which specifies the parameters for which hazardous waste will be tested, the test methods used, the sampling method, and the frequency of sampling.

DOE 5400.3, Hazardous and Radioactive Mixed Waste Program, states that "it is the policy of DOE to manage all Departmental hazardous and radioactive mixed wastes according to the requirements of Subtitle C of the Resource Conservation and Recovery Act (RCRA), and the Atomic Energy Act, respectively" (Section 6.a).

Finding

There is no formal program in place to identify, characterize, store, treat, and dispose of classified hazardous and mixed waste.

Discussion

SNL, Albuquerque, has an unknown quantity of classified materials which are no longer of use and may, thus, be defined as waste and need to be disposed of properly.

The following specific deficiencies in the classified waste program were identified:

- 1) SNL, Albuquerque, has not developed a formal procedure to identify and inventory all the classified material which may be waste. A draft project plan has been written and is in the process of being implemented.
- 2) SNL, Albuquerque, does not have procedures to characterize classified waste as hazardous waste, mixed waste, or nonhazardous waste. Classified waste is likely to be hazardous where it is comprised of metal alloys containing lead, cadmium, or other metals. Such waste would be hazardous if it exhibits toxicity characteristics or if it is a listed waste. Analysis of classified waste for purposes of hazard

characterization is technically difficult in cases where the waste item is a weapons component which cannot easily be disassembled and analyzed. Consequently, the only feasible method for the proper characterization of some classified waste may be the application of knowledge of the hazard characteristic of the waste in light of the materials or the processes used to generate the waste. A project is underway, however, to develop a process to identify hazardous material in excess weapons like NELA assemblies, components, and parts. Classified waste may also be characterized as mixed wastes if it is hazardous under the Resource Conservation and Recovery Act (RCRA) and also radioactive (I-WM-104).

- 3) SNL, Albuquerque, has not implemented a program to identify and characterize the legacy classified waste (I-WM-104). Legacy waste is material that has resulted from programs that have been terminated without waste materials being properly characterized, or from the retention of materials for some undefined future use without a current owner being identified (I-R-201 and I-R-206).
- 4) SNL, Albuquerque, does not have a formal program or proper facilities to manage classified waste as hazardous waste once the waste is characterized as hazardous or mixed waste. For example, there is no designated hazardous classified waste facility or accumulation area to store hazardous classified waste. Also, there are no procedures specific to hazardous classified waste to ensure that regulatory requirements such as labeling and containment are met (I-WM-105 and I-WM-106).
- 5) SNL, Albuquerque, does not have procedures in place to declassify hazardous classified waste so that it can be disposed or treated. Additionally, the facility has not identified its options for disposal or treatment of hazardous classified waste to meet applicable RCRA requirements. The project plan on classified waste does address this issue. It should be noted that this is a problem throughout all DOE facilities (I-WM-104 and I-WM-105).

This finding was addressed in the PTTSA Report and the ES&H Action Plan.

FINDING WM/CF-10: Classified Waste Landfill

Performance Objective

The New Mexico Solid Waste Management Regulations (NMSWMR), Part 2, Section 201(B), requires that operators of solid waste disposal facilities that were in existence before May 15, 1989, and that continue to operate after that date file a Notice of Intent to Continue to Operate with the New Mexico Environmental Department by August 1989. The notice must include information regarding quantities and types of waste being received, including any special wastes. The notice must also include the operator's intent to continue to receive the special wastes.

NMSWMR, Part 3, Section 301, states that landfill operators must meet certain requirements, including prevention of unauthorized access by the public and wildlife to the facility, prevention of the entry of runoff to the landfill, employment of trained operators, development of a plan to prevent disposal of regulated hazardous and special waste, and conducting regular inspections.

NMSWMR, Part 3, Section 302, requires landfill owners to submit a closure and post-closure plan for the landfill.

Finding

SNL, Albuquerque is not operating the classified waste landfill in accordance with New Mexico regulations and has failed to file a Notice of Intent to Continue to Operate the classified waste landfill.

Discussion

1. The classified waste landfill is not being operated in accordance with New Mexico regulations. The following deficiencies were noted:
 - a. There is no means to ensure that runoff will be prevented from flowing onto the landfill.
 - b. The landfill operators have not received proper training.
 - c. There are no formal procedures to prevent inadvertent disposal of regulated hazardous and special wastes in this facility.
 - d. Regular inspections are not being conducted.
2. The classified waste landfill, which is used to dispose of nonhazardous classified (not documents) waste, began operations prior to May 15, 1989. SNL, Albuquerque, has not filed a Notice of Intent to Continue to Operate the landfill. This notice was due to be filed with the State of New Mexico by August 1989.

This finding was not addressed in the PTTSA Report or the ES&H Action Plan.

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FINDING WM/CF-11: Hazardous Waste Training for Generators

Performance Objective

40 CFR 262.34(a)(4) states that all generators that accumulate hazardous waste onsite for 90 days or less must receive hazardous waste training equivalent to 40 CFR 265.16.

40 CFR 265.16 states that personnel at hazardous waste treatment, storage, or disposal facilities (TSDFs) must complete training that ensures the facility's compliance with hazardous waste regulations. The training must instruct personnel on waste management procedures relevant to the positions in which they are employed, and must be designed to ensure that facility personnel are able to respond effectively to emergencies. The training must be documented and renewed annually. Additionally, written job descriptions, including training requirements, must be maintained.

Finding

The effectiveness of the hazardous waste training program for generators is compromised by the lack of a formal, well-coordinated system to identify generators needing training and by the omission of key waste management topics.

Discussion

SNL, Albuquerque, provides a training course for its hazardous waste generators. The course consists of 2 to 3 hours of classroom instruction and 1 to 2 hours for questions and answers. The trainers will walk through the operations of the trainees before they give the course so that the training can be specifically tailored towards the types of waste generated at that particular line organizations. Training is documented and trainees are issued certificates, as well as a course manual which they keep as reference. Testing is currently not part of this training program.

The Environmental Subteam observed that among those employees who did receive the training, hazardous waste was not managed consistently at the line organization level.

The following deficiencies were noted with respect to SNL, Albuquerque's hazardous waste generator training program:

- SNL, Albuquerque, does not have a system whereby personnel who may manage hazardous waste are tracked through a central database to determine whether they need hazardous waste management training and to track the training they have received. Individual line organizations are currently required to identify personnel within the organization that require hazardous waste training; however, responsible personnel within the line organization may not have the knowledge or background necessary to recognize that hazardous waste training is required (I-WM-115).
- Initial training has not been provided to all SNL, Albuquerque, personnel who potentially handle or manage hazardous waste

Training is currently planned for all personnel not already trained (I-WM-115).

- The current training program does not identify medical waste as a specially regulated waste with unique management requirements. While medical waste is not a large volume waste stream at SNL, Albuquerque, it is generated at the infirmary and several other locations (WM-153).
- The current generator training program does not address unusual waste generation circumstances, such as unusual increases in the volume of waste generated. For example, the Environmental Subteam observed several instances in which line organizations had cleaned out their chemical supplies which were no longer being used, but did not know how to manage the unexpectedly large amount of waste generated as a result of this activity. Specific problems noted were excess amounts of waste stored in satellite accumulation areas, and unlabeled wastes (WM-153).

This finding was partially addressed in the PTTSA Report and in the ES&H Action Plan.

FINDING WM/CF-12: Hazardous Waste Thermal Treatment Unit

Performance Objective

40 CFR 265.377 states that, during operation, thermal treatment operators must conduct daily inspections of the treatment unit equipment for leaks, spills, and the condition of the emergency control equipment. Also, the emission control devices must be inspected every 15 minutes, and visible emissions must be inspected at least hourly during thermal treatment unit operation.

Finding

During operation of the thermal treatment unit, daily inspections are not always conducted on multiday burns, and the 15 minute and hourly inspections of the emission control devices and visible emissions, respectively, are not documented.

Discussion

RCRA inspections of the thermal treatment unit, including checking for leaks, spills, and emergency control equipment condition, are conducted on a weekly basis and before and after each burn; however, on multi-day burns only the first day of inspection is documented, although reportedly the inspections are conducted. Also, the emission control device (propane fuel indicator/valve/gauge) inspection, required every 15 minutes, and the hourly visible emissions checks are not documented. A television and intercom is monitored continuously during burn events, but any normal, visual observations made are not documented.

This finding was not noted in the PTTSA Report or in the ES&H Action Plan.

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FINDING WM/CF-13:**Waste Minimization Program****Performance Objective**

DOE 5400.1, General Environmental Protection Program, Chapter III, Section 4.b, requires that a waste minimization plan and program be in place by May 9, 1990.

DOE 5400.3, Hazardous and Radioactive Mixed Waste Programs, Paragraph 7.d.5, states that heads of field organizations shall implement a waste minimization program for hazardous and radioactive mixed wastes, as is described in DOE 5400.1.

DOE 5820.2A, Radioactive Waste Management, requires DOE facilities to establish auditable programs (i.e., goals, incentives, procedures, and reports) to assure that the amount of low-level radioactive mixed waste generated is minimized.

The Implementation Guidance for DOE 5400.1 states that the combination of DOE 5820.2A and RCRA make waste minimization activities mandatory for DOE radioactive, mixed, and hazardous waste programs. Key elements discussed in the implementation guidance include designating a site Waste Reduction Coordinator; maintaining the appropriate level of documentation and accountability for waste minimization; and maintaining sufficient documentation to satisfy all requirements of the field office Waste Operation Quality Assurance Program.

40 CFR 262.20 requires generators of hazardous waste to complete a manifest for each shipment of hazardous waste according to the instructions provided in the Appendix to Part 262. Item 16 of the manifest requires the generator to certify that a program is in place to minimize waste. 40 CFR 262.41(a)(7) and (9) require the generator to report the success of his waste minimization program in a biennial report. EPA has also issued guidance on waste minimization in 52 Federal Register 25056.

Finding

SNL, Albuquerque, has not fully developed or implemented a Waste Minimization Program.

Discussion

SNL, Albuquerque, submitted the required Waste Minimization and Pollution Prevention Awareness Plan to KAO on May 7, 1990. The plan was reviewed and a draft revision was issued on April 30, 1991.

The Waste Minimization Plan presents an agenda for development of waste minimization programs, but most of the required elements are not yet developed. The plan recognizes the applicable requirements and acknowledges that the issues will be studied and programs will be developed, but it currently lacks specifics to adequately address all applicable requirements.

To aid in the development of programs, SNL, Albuquerque, has initiated implementation of the MinNet program, which is designed to involve line organizations in the waste minimization process. The identification of MinNet

representatives within the line organizations is currently being completed. Once the representatives are all identified, SNL, Albuquerque, is scheduled to begin initiating process waste assessments sitewide, which will include study and evaluation of all waste streams and the processes that create those waste streams (I-WM-2).

While the formal Waste Minimization Program is not yet developed, some line organizations have initiated their own individual waste minimization efforts outside the purview of the MinNet program. For example, the Process Development Laboratory (PDL) changed the etching process, which greatly reduced the amount of hazardous waste generated (I-WM-14). Another example of individual waste minimization is the Chemical Exchange Program administered through Division 3221. Under this program, the facility attempts to reissue for use any unopened and unexpired containers of chemicals which the original user had decided to dispose of as hazardous waste (I-WM-20).

This finding was identified in the PTTSA Report and in the ES&H Action Plan.

FINDING WM/CF-14:**Hazardous Waste Manifests****Performance Objective**

40 CFR 265.72(c) requires operators of treatment, storage, or disposal facilities (TSDFs) who ship waste offsite to comply with the manifest requirements of 40 CFR 262, Subpart B, which require formal tracking of waste from cradle to grave. 40 CFR 262.42 also requires operators of TSDFs who ship waste offsite to contact the offsite facility if a copy of the manifest is not received from the offsite facility within 35 days of shipment, and to file an Exception Report with the state if not received within 45 days. 40 CFR 265.72 requires TSDFs to attempt to resolve with waste generators any discrepancies between the manifest and actual waste received.

Finding

SNL, Albuquerque, does not have an approved written procedure for preparation, approval, and tracking of manifests to ensure compliance with manifest requirements.

Discussion

Although manifests generally appear to be adequately prepared and approved, SNL, Albuquerque, does not have approved written procedures to ensure that manifests are completed in accordance with regulatory requirements. Similarly, there are no written procedures describing the tracking of manifests after wastes are shipped offsite. In addition, the following observations were made regarding the tracking system:

- Tracking is performed by one Rinchem individual and no other facility personnel are currently familiar with her tracking system. Therefore, no backup is available to perform tracking when this individual is not at work. Rinchem indicated that a second person was recently hired who will provide tracking backup, but that person had not been trained at the time of the Tiger Team Assessment (I-WM-69).
- The tracking system used is too informal to ensure that the appropriate activities take place at the 35- and 45-day deadlines specified in 40 CFR 262.42. The tracking system consists of the following: Manifests are stored in a filing cabinet with a separate file for each shipment. A green dot is placed on the file tabs of the shipments for which the manifest has not yet been received from the offsite facility and the file tab indicates the date the waste was shipped offsite. The individual who tracks the manifests checks the green dots on a variable basis - sometimes once a week, twice a week, or whenever she goes into the drawer (I-WM-70). Since the only date on the tabs is the date the shipment was transported, the 35- and 45-day deadlines have to be manually calculated each time the green dots are checked. Such a system does not ensure the deadlines are accurately and consistently identified.

The following instances of noncompliance with manifest tracking requirements were found:

- Manifest #846 - The shipment was transported on October 19, 1990, and the "received" date stamped on the returned manifest was December 13, 1990, which is 55 days after initial transport. There was no documentation that an Exception Report was submitted to the State, nor did SNL, Albuquerque, or Rinchem personnel recall ever preparing an Exception Report (I-WM-39 and I-WM-70).
- Manifest #354 - The shipment was transported on November 8, 1989, and the received date stamped on the returned manifest was January 14, 1990, which is 67 days after initial transport. There was no documentation that an Exception Report was submitted to the State, nor did SNL, Albuquerque or Rinchem personnel recall ever preparing an Exception Report (I-WM-59 and I-WM-70).
- Rinchem personnel told SNL, Albuquerque, that they may have received a facsimile from the offsite facility in the above instances by the 45-day deadline, but there was no documentation of them having received it (I-WM-54). SNL, Albuquerque, personnel present immediately instructed the Rinchem contractor to maintain copies of any such facimilies. SNL, Albuquerque, also noted that the manifests are not logged in the day they are received by SNL; they are only logged in when SNL delivers them to Rinchem, which is on a variable basis (SNL is supposed to deliver mail from SNL offices to Rinchem "whenever someone goes over to Rinchem"). SNL, Albuquerque, personnel indicated they would instruct the SNL secretary who initially receives the manifests to stamp them with the date received.
- Manifest #770 - The original manifest signed by SNL, Albuquerque, on the date of shipment designated only one transporter, whose company name and EPA identification number were included on the manifest. When a copy of the manifest was received from the offsite facility, a second transporter had signed the manifest, but had not included the transporter's company name or EPA identification number. There was no documentation to demonstrate that SNL, Albuquerque, or Rinchem followed up on this omission, nor did SNL, Albuquerque, or Rinchem recall investigating this matter (I-WM-59).
- Manifests #706-724, 607, 115, 112, and 110 - The file contained a copy of the manifest from the offsite facility, but there was no date received stamped on the manifest. Therefore, it is not possible to determine if these manifests were received by the 45-day deadline.
- Manifests #419-444 and 253-260 - For each of these two shipments, the manifests received from the offsite facility were stapled together and the received date was stamped only on the top manifest. If these manifests become unattached, it will not be possible to determine if the bottom manifests were received by the 45-day deadline.
- There is no central documentation or tracking of manifest discrepancies noted by the offsite facilities used by SNL, Albuquerque. Offsite facility telephone calls regarding

discrepancies are generally handled by one Rinchem contractor, but others may resolve discrepancies if he is not available (I-WM-71). The only documentation regularly maintained is the discrepancy notation made by the offsite facility on the individual returned manifests. If discrepancies were tracked or documented in a central location, this would allow monitoring of SNL, Albuquerque, and Rinchem performance in generating accurate manifests and to identify trends that may require corrective action. For example, Rinchem personnel noted that the most frequent discrepancy was that the waste stream sent to the offsite facility correctly matched the waste type in the waste profile form, but was outside the limits allowed for certain waste parameters (I-WM-71). Tracking such discrepancies may identify that certain generators at SNL, Albuquerque, have recurring problems characterizing their waste, or that Rinchem procedures to verify generator waste characterization information need revision.

This finding was not addressed in the PTTSA Report nor in the ES&H Action Plan.

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FINDING WM/CF-15: Underground Storage Tank Program

Performance Objective

Underground storage tanks (USTs) containing regulated substances are subject to the State of New Mexico Environmental Improvement Board, Underground Storage Tank Rules (EIB/USTR) 100 through 1400, and EPA Regulations codified at 40 CFR 280.

EIB/USTR 204 requires that UST operators notify the State, orally within 24 hours and in writing within 7 days, of a spill of regulated substance at a UST that exceeds a threshold quantity or that cannot be cleaned up within 24 hours.

Finding

SNL, Albuquerque, and DOE have not implemented a program for the management of underground storage tanks that will ensure compliance with regulatory requirements.

Discussion

In a review of the SNL, Albuquerque, UST program, the Environmental Subteam noted the following:

- SNL, Albuquerque, staff were first made aware of spillage associated with overfilling of USTs numbered 6595-1 through 6995-5 in the Comprehensive Environmental Assessment and Response Program (CEARP) Phase I study completed in September 1987. More recent SNL memoranda dated January 3, 1990 (WM-9), and February 15, 1991 (WM-8), about site inspections of the underground oil storage tanks, Number 6595-1 through 6995-5 in Technical Area V also address the releases.
- The Tiger Team noted soil staining associated with overfilling of these tanks (I-GW-14). Interviews with site personnel indicated that the tanks had been overfilled on numerous occasions (I-GW-6 and I-GW-16).
- The New Mexico Environment Department (NMED), however, was not notified of the operational overfilling of the tanks until February 27, 1991 (WM-4). Therefore, SNL, Albuquerque, exceeded the requirement for 24-hour oral notification and 7-day written notification to the NMED.

This finding was not identified in either the PTTSA Report or the ES&H Action Plan.

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FINDING WM/CF-16: Transuranic Waste

Performance Objective

DOE 5820.2A, Radioactive Waste Management, Chapter II, Section 3.a, requires that known or suspected transuranic (TRU) contaminated materials be evaluated to determine their status. Section 3.b requires volume reduction and also that TRU waste be assayed or otherwise evaluated to determine the kinds and quantities of TRU waste prior to storage. Additionally, hazardous waste components shall be estimated or analyzed.

Section 3.c states that TRU waste shall be certified, pursuant to the Waste Isolation Pilot Plant (WIPP) Waste Acceptance Criteria (WAC), placed in interim storage, and sent to WIPP when it becomes operational. Certification plans shall be in accordance with WIPP-DOE-069 and have an associated quality assurance plan in accordance with WIPP-DOE-120.

Section 3.e states that TRU waste may be temporarily stored at generating sites consistent with the following requirements: 1) TRU waste shall be segregated or otherwise clearly identified to avoid commingling with other waste streams; 2) TRU waste storage areas shall be protected from unauthorized access; 3) TRU waste shall be monitored periodically; 4) TRU waste storage facilities shall be designed, constructed, and operated to minimize the possibility of fire, explosion, or accidental release; 5) Facilities which store TRU waste shall have a contingency plan; and 6) TRU waste shall be stored in such a way as to maintain exposures that are as low as reasonably achievable (ALARA).

Section 3.j requires that TRU waste operations shall be conducted in accordance with NQA-1 and other appropriate national consensus standards.

Finding

SNL, Albuquerque has not developed or implemented a TRU waste program to implement the requirements of DOE 5820.2A for generation, certification, storage, and quality assurance.

Discussion

SNL, Albuquerque has made little progress toward developing a formal TRU waste program since the issuance of DOE 5820.2A. As a result, not all of the TRU requirements of that Order have been implemented (I-R-2, I-R-17, and I-R-107). The following specific deficiencies were identified:

- 1) There is no site-wide TRU waste program defined in a formal document and implemented by procedures. There is no TRU waste operations quality assurance plan.
- 2) Known or suspected TRU-contaminated materials are not evaluated as soon as possible to determine their status. This is especially true of the TRU material stored at Manzano Area.
- 3) There is no fully developed and implemented volume reduction/activity minimization program for TRU waste (R-38 and R-39). AL 5820.2, Section 7.A, requires that wastes containing enriched uranium and other alpha

emitters be considered as TRU waste even though these materials are not considered as TRU waste by DOE 5820.2A. Although, DOE 5820.2A does not prohibit DOE AL from doing this, the blanket approach used in AL 5820.2 is contrary to the volume reduction requirements of DOE 5820.2A.

- 4) The methods for evaluating the kinds and quantities of TRU materials and the hazardous waste component are not formally documented.
- 5) SNL, Albuquerque generates both contact handled (CH) and remote handled (RH) TRU waste. However, a WIPP-WAC certification plan and associated quality assurance plan for either of these waste streams have not yet been prepared and implemented as required. The Los Alamos National Laboratory (LANL) and SNL, Albuquerque made plans in the late 1970s for SNL, Albuquerque to ship its uncertified TRU waste to LANL for certification and storage (R-29). After DOE 5820.2A was issued in September 1988, LANL decided not to implement these plans. SNL, Albuquerque did not have a contingency plan and has not yet formulated a new plan to come into compliance. As a result, SNL, Albuquerque does not meet the certification requirements of the Order.
- 6) SNL, Albuquerque does not have a program to ensure that temporary TRU storage locations are designed or operated to meet the requirements of DOE 5820.2A, Chapter II, Section 3.e. The Tiger Team identified temporary TRU waste storage sites at Manzano Base and in a vault near the Hot Cell Facility. These facilities fail to meet at least one criterion of DOE 5820.2 and may not comply with others.
 - a) There has been no formal effort to evaluate whether or not these facilities meet the requirements of DOE 5820.2. There is no documentation that demonstrates compliance with the applicable criteria. There is no detailed plan to bring these facilities into compliance with the Order.
 - b) Contingency Plans have not been developed and implemented for any of the TRU waste storage facilities; however, some draft plans have been prepared (R-52, R-53, and R-54).
 - c) Other than for Manzano Area, there are no formal requirements or restrictions for authorized access to the storage facility itself. At Manzano Base the restrictions are for security reasons and are not based on TRU considerations.
 - d) There are no restrictions on storing other types of radioactive and mixed wastes within these facilities as long as security and criticality limits are met.
 - e) There are no requirements for periodic monitoring other than to meet DOE material accountability requirements.
 - f) Other than for Manzano Area, it is likely that the facilities do not meet the DOE 5820.2A design and construction requirements.

- g) There is no program to ensure that TRU waste is stored in a manner to maintain exposures ALARA.

This finding was partially addressed in the PTTSA Report and the ES&H Action Plan.

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FINDING WM/CF-17: Low-Level Waste Performance Assessment

Performance Objective

DOE 5820.2A, Radioactive Waste Management, Chapter III, Section 3.b, states that each field organization shall, for each DOE reservation within its cognizance, prepare and maintain an overall waste management systems performance assessment supporting the combination of waste management practices used in generation reduction, segregation, treatment, packaging, storage, and disposal. It also states that where practical, monitoring measurements to evaluate actual and prospective performance should be made at locations as required, within and outside each facility and disposal site. Monitoring should also be used to validate or modify the models used in performance assessments.

Finding

AL has not prepared and maintained an overall waste management systems performance assessment for SNL, Albuquerque as required by DOE 5820.2A.

Discussion

Efforts to perform the waste management systems performance assessment for SNL, Albuquerque were initiated at the time of the Tiger Team Assessment, which is over 2.5 years after the effective date of DOE 5820.2A. Plans and a schedule for completion of this work have not been established. The need for this assessment was addressed in the Waste Management Implementation Plan (R-32), but a schedule for completion was not included in the summary table. The assessment is not addressed at all in the annual update to that plan (R-33), contrary to the requirements of DOE 5820.2A.

AL is aware of the requirement but has not initiated any actions because of lack of specific guidance from DOE Headquarters (HQ) on how to perform the performance assessment (I-R-107). Some guidance exists (DOE/LLW-63T), but it has been recognized by DOE HQ (R-72) that many sites are struggling with implementation of this requirement and need additional guidance. Efforts are underway by EM-30 to revise the guidance and it is expected to be completed by September 1991. Even though DOE HQ (R-72) has recognized the need for additional guidance, this does not excuse the Operations Offices from implementing the performance assessment requirement of DOE 5820.2A in a timely manner. The purpose of the performance assessment is to establish the baseline for low-level operations to be used in future low-level waste planning activities and improvements.

This finding was not addressed in the PT TSA Report and the ES&H Action Plan.

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FINDING WM/CF-18: Radioactive Waste Volume Reduction

Performance Objective

DOE 5820.2A, Radioactive Waste Management, Chapter III, Section 3.c, states that technical and administrative controls shall be directed to reducing the gross volume of waste generated and/or the amount of radioactivity requiring disposal. These requirements apply to low-level waste (LLW) and the radioactive component of mixed waste. Waste reduction efforts shall include consideration of process, material substitution, and decontamination. All DOE (LLW) generators shall establish auditable programs (goals, incentives, procedures, and reports) to assure that LLW generation is minimized. Each LLW generator shall separate uncontaminated waste from LLW waste to facilitate cost-effective treatment and disposal. Section 3.f requires that waste treatment techniques be used to the extent that they are cost effective.

DOE 5820.2A, Chapter II, Section 3.b, establishes the volume reduction requirements for transuranic waste that are similar to those for LLW.

DOE 5400.1, General Environmental Protection Program, Chapter III, Section 4.b, requires that a waste minimization plan be prepared by May 9, 1990, reviewed annually, and updated every 3 years.

Finding

SNL, Albuquerque has developed a waste minimization and pollution prevention awareness program, but it has not been fully implemented to accomplish volume reduction for transuranic, mixed, and low-level radioactive waste in a manner that meets all of the requirements of DOE Order 5820.2A.

Discussion

DOE Order 5820.2A was issued on September 26, 1988, however, over 2.5 years after the radioactive waste volume reduction requirements were issued, the SNL, Albuquerque program has not been effectively implemented. SNL has stated that volume reduction is included in the Waste Minimization and Pollution Prevention Awareness Plan (R-38 and R-39). The Laboratory has made some efforts towards implementing volume reduction and although some degree of success has been achieved these are largely ad hoc and do not constitute an integrated volume reduction program as required by the Order. During tours and interviews, the Tiger Team observed staff awareness of the need for volume reduction.

The Tiger Team identified the following specific deficiencies in the radioactive waste volume reduction program:

1. Formal technical and administrative goals for radioactive waste volume reduction have not been developed. Some general goals have been established (R-39 and R-40), but they do not address radioactive wastes specifically and they are not auditable.
2. Processes that generate radioactive waste have not been formally evaluated to consider modification, optimization, materials substitution, and decontamination as a means of volume reduction. Some efforts have been made to evaluate new facilities (Strategic Defense

Facility, Radioactive and Mixed Waste Management Facility, Explosive Components Facility, and Toxic Machining Facility), but they are informal and not documented. SNL has also prepared a draft plan to perform process waste assessments (R-41 and R-42), but it has not yet been implemented.

3. The existing program includes goals, incentives, and reports (R-40). The program does not include procedures, and implementation of the program has not been audited. Current goals, incentives, and reports are not sufficiently detailed to provide an auditable basis.
4. All waste materials from potentially contaminated areas or from areas where they may have been activated are considered contaminated. No segregation is performed of these materials to separate the uncontaminated waste from the radioactive waste as required by DOE 5820.2A.
5. SNL, Albuquerque does not possess the operating facilities to implement waste treatment techniques such as decontamination, shredding, compaction, and size reduction to the extent that it is cost effective. SNL, Albuquerque constructed a Radioactive and Mixed Waste Management Facility (RMWMF) to provide some of these capabilities; however, due to inadequate planning by DOE and SNL, Albuquerque, the facility is not yet operational. Construction was completed on the RMWMF in March 1990; however, it was only classified as a nuclear facility in April 1991. This facility will not likely be ready to operate for a year or more because it lacks an approved Environmental Assessment, Safety Analysis Report, Operational Safety Requirements, waste acceptance criteria, operations procedures, and necessary physical modification.

This finding was partially addressed in the PTTSA Report and the ES&H Action Plan.

FINDING WM/CF-19: Low-Level Waste Characterization

Performance Objective

DOE 5820.2A, Radioactive Waste Management, Chapter III, Section 3.d, states that low-level waste (LLW) shall be characterized with sufficient accuracy to permit proper segregation, treatment, storage, and disposal. This characterization shall ensure that, upon generation and after processing, the actual physical and chemical characteristics and major radionuclide content are recorded and known during all stages of the waste management process.

Section 3.d states that waste characterization data shall be recorded on a waste manifest and shall include the physical and chemical characteristics, volume of waste, weight of waste, major radionuclides and their concentrations, packaging date, package weight, and external volume. The concentration of radionuclides may be determined by direct or indirect methods, if there is reasonable assurance that the indirect methods can be correlated with actual measurements.

Section 3.m states that each field organization shall develop and maintain a record keeping system that documents the following: historical record of waste generated, treated, and stored at the facilities under its cognizance. The information maintained shall include all data necessary to show that the waste was properly classified, treated, and stored. The data maintained shall be based on data from the waste manifests. Records shall be kept and accompany each waste package from generator through final disposal. Waste manifests shall be kept as permanent records and include all data necessary to demonstrate compliance with waste acceptance criteria.

Finding

SNL, Albuquerque has not fully developed and implemented a low-level waste (LLW) characterization program consistent with the requirements of DOE 5820.2A.

Discussion

This finding applies to both LLW and the radioactive component of mixed waste. SNL, Albuquerque has a program for characterizing LLW; however, its scope is not sufficient to result in characterization that meets the requirements of DOE 5820.2A (R-20). In addition, the program is not implemented through formal procedures. The Tiger Team identified the following deficiencies in LLW characterization (I-R-2, I-R-17, and I-R-118):

1. Waste sampling and analysis is not performed on LLW or the radioactive component of mixed waste except in rare cases. Consequently, in almost all cases characterization of radionuclide content is based on generator knowledge. This does not fully meet the requirements of DOE Order 5820.2A for direct or indirect analysis.
2. There is a draft waste analysis plan (R-30) that was prepared in March 1990; however, it has never been finalized and has not been implemented.

3. Generators are provided with limited guidance in the ES&H Manual (R-20) on how to determine the nonradiological waste information that must be included on the manifest.
4. There is no quality assurance program associated with the characterization program.
5. The characterization and manifest system is only implemented for waste as a part of the requisition pick-up system. Waste that is not requested for pick-up by the generator is not tracked in the manifest system.
6. The waste manifest and record keeping system does not meet the requirements of DOE 5820.2A. The following deficiencies were identified:
 - Packaging date is not included on the manifest form.
 - A review of filed Radioactive and Mixed Waste Disposal (RMWD) forms for waste that has been picked up indicated that the majority had one or more blank spaces.
 - Each radioactive waste package picked up for storage at the inactive Technical Area III disposal site is placed in a numbered container. The procedure that describes how this information is documented and tracked is inadequate.
 - Storage facilities for the completed RMWD forms and associated documents does not meet the requirements of DOE Orders (see Finding QA/CF-1).
 - The current manual filing system cannot be used to readily retrieve information on a specific waste package or all information on waste stored in a specific container. However, a computerized database is being developed.

This finding was fully addressed in the PTSA Report and the ES&H Action Plan.

FINDING WM/CF-20: Low-Level Waste Certification Program

Performance Objective

DOE 5820.2A, Radioactive Waste Management, Chapter III, Section 3.e, states that Waste Acceptance Criteria (WAC) shall be established for each low-level waste (LLW) treatment, storage, and disposal facility (TSDF), and submitted to the cognizant field organization. It also states that generators of waste shall implement a LLW certification program to provide assurance that the WAC for any LLW TSDF used by the generator are met. The WAC shall address the following issues: allowable quantities/concentrations of specific radionuclides to be handled, processed or stored; restrictions regarding security classifications; external radiation and internal heat generation; restrictions on generation of gases, vapors, or liquids in waste; chemical and structural stability of waste packages, radiation effects, microbial activity, chemical reactions, and moisture; restrictions for chelating and complexing agents having the potential for mobilizing radionuclides; and quantity of free liquids.

Finding

The SNL waste certification program for the Technical Area III above-ground storage facility does not provide adequate assurance that the waste acceptance criteria (WAC) for that facility are met.

Discussion

The SNL WAC are defined in the ES&H Manual (R-20) and are consistent with the requirements of DOE 5820.2A. However, there is no formal certification program designed to ensure that the generators and storage facility comply with the WAC. The certification program consists of the following two elements: the generator's signature on the Radioactive and Mixed Waste Disposal (RMWD) form certifying that the entered information is correct, and a visual inspection by the Radioactive and Mixed Waste Division (3222) prior to pick-up.

The following specific deficiencies were noted by the Tiger Team:

1. There is no quality control of generator certification activities. No waste that is picked up is opened and independently characterized to ascertain if the information supplied by the generator on the RMWD form is correct.
2. There is a single procedure that briefly describes the RMWD form process (R-8). However, it does not provide any detailed information on how the RMWD process is implemented such as assigning a requisition number, logging it into the system, reviewing the form, notifying the generator of an adequate form, filing the completed form, etc. In addition, the procedures do not describe the requirements for documenting these processes and filing the information.
3. Improperly filled out RMWD forms are returned to the generator for correction. However, no statistics are kept on this process so that tracking and trending can be performed, such as the total numbers of

rejections, reasons rejected, and number of rejections against individuals and organizations. This type of quality control data is essential to identify program weaknesses and their root cause.

4. A formal training program has not been fully developed and implemented to train the generators on how to perform the certification, and no guidance documents or procedures are available for their use.
5. The current RMWD system has no provision for notifying the generator that their waste has been picked up.
6. Waste pickup inspection is not fully described in procedures and current inspection practices do not adequately verify compliance with the WAC. The disposal request form is reviewed for WAC conformance, and, if acceptable, a pick-up is scheduled. At the time of pick-up, a direct radiation survey is performed on the bag, and it is visually inspected for integrity. This information is checked against the disposal request form, but other elements of WAC compliance are not verified. Additional information is required on waste from Technical Area V (R-20) but there is no requirement that this information be verified as a part of the pickup process.
7. Methods are not adequately defined for rejecting waste during the pick-up process including the following: notifying the generator, resolving the problem, documenting the occurrence, and tracking and trending this type of information as quality control data.
8. The ES&H Manual (R-20) requires that the generator shall fill out and attach a Radioactive and Mixed Waste tag with the requisition number assigned to the RMWM form. The waste handling procedure (R-8) states that Division 3222 will fill out and attach the tag if one is not present when they arrive to pickup the waste. This is not in accordance with the ES&H Manual and may cause the waste to be improperly labeled or identified with the wrong RMWD form.
9. The generator's characterization of radionuclide type and amount relies upon process knowledge and conversion of mass to activity (see Finding WM/CF-19). Since the amount of activity in the waste is not well known, it is difficult for SNL to assure that the maximum activity totals prescribed in the WAC will not be exceeded.
10. There is no quality assurance program associated with the certification program to measure generator and Division 3222 compliance with the requirements of the WAC.
11. The nuclide activity limits contained in the WAC are based on a consequence analysis. However, the analysis is not formal or well documented. Running totals of nuclide inventories are updated monthly using a spreadsheet, but this process is not formalized in a procedure or otherwise documented.

This finding was partially addressed in the PTTSA Report and the ES&H Action Plan.

FINDING WM/CF-21: Long-Term Storage of Low-Level Waste

Performance Objective

DOE 5820.2A, Radioactive Waste Management, Chapter III, Section 3.h, requires that low-level waste (LLW) be stored to meet the performance objectives of the Order. Records shall be maintained for all waste that enters and leaves the storage facility. The development and operation of a waste storage facility shall be supported by the following documentation: an analysis that identifies the need for the facility; a construction design report, including projected waste planned for storage, construction and cost estimates; a Safety Analysis Report and appropriate National Environmental Policy Act (NEPA) documentation; and operational procedures and plans. Storage of waste to allow nuclides to decay, or storage of wastes until they can be disposed of, are acceptable.

Finding

The storage of LLW at SNL, Albuquerque, both at satellite locations and at the Technical Area III mixed waste landfill, do not fully meet the requirement of DOE 5820.2A for protection of the environment and conduct of operations.

Discussion

SNL, Albuquerque, does not have a fully developed or implemented program that establishes minimum standards and requirements for the storage of LLW except for the Technical Area III mixed waste disposal facility. Consequently, storage of LLW at other locations does not meet the requirements of DOE Orders. In addition, the Technical Area III storage facility does not fully comply with all of the documentation, characterization, and waste acceptance criteria requirements of DOE 5820.2A. Routine operations at the Technical Area III landfill itself are generally in compliance with the Order. The Tiger Team has identified the following specific deficiencies:

1. There is no formal safety analysis or NEPA documentation for the storage facility at the Technical Area III landfill. There is one procedure associated with this facility (R-8), but more are necessary to fully describe all activities associated with operation of the landfill (I-R-118)
2. All LLW at the Technical Area III landfill is placed in strong, tight containers that are stored outdoors and are periodically surveyed for surface contamination. A recent survey (R-49) showed no detectable contamination. The allowable contamination limits are not specified in a procedure, so it is possible for contamination to be transferred directly from the containers to the environment. In practice, it appears that the contamination limits specified in DOE 5480.11 (I-R-118) are used. If contamination levels meet the 5480.11 release limits, then controls for transfer of contamination meet the requirements of DOE Orders; however, it is not a best management practice.
3. Generators of LLW must provide for their own LLW storage, when awaiting pickup by the Radioactive and Mixed Waste Division, of waste certified under waste acceptance criteria, or when waste does not meet the Technical Area III storage site WAC. A significant portion of the

volume of LLW generated at SNL, Albuquerque does not meet WAC and so cannot be accepted at the Technical Area III storage site. LLW storage areas provided by the generators may not be adequate because of the lack of training, standards, guidance, and control for LLW storage. The following deficiencies were identified:

- a) Outdoor storage of noncontained contaminated material (see Finding RAD/CF-8).
- b) The Sandlot in Technical Area V is used to store LLW outdoors in containers or inside of buildings. The buildings are of the temporary type and do not provide sufficient enclosure from the environment. The outside contained storage has the same potential for environmental exposure described in 2. above.
- c) LLW is stored in many other temporary structures or transportainers that have the same problem described in (b) above, such as transportainers used at at Technical Area IV, Building 6630, and Building 906.

This finding was partially addressed in the PT TSA Report and the ES&H Action Plan.

**FINDING WM/CF-22: Technical Area III Low-Level, Mixed Waste, and
Classified Waste Landfills**

Performance Objective

DOE 5820.2A, Radioactive Waste Management, Chapter III, Section 3.a, states that waste that has not been disposed of prior to the issuance of this Order shall be managed on the schedule developed in the Implementation Plan for compliance with this Order to assure that exposure due to the waste does not exceed 25 mrem/yr to any member of the public.

Section 3.j requires that field organizations shall develop site-specific comprehensive closure plans for new and existing operating low-level waste (LLW) disposal sites. The plan shall address closure of disposal sites within a 5-year period after each is filled. Performance objectives shall be developed as part of the NEPA process. Inactive disposal sites shall be managed in conformance with RCRA, CERCLA, and SARA. Closure plans for existing operating LLW disposal facilities shall be reviewed and approved by the appropriate field organization.

Section 3.k requires that each operational or nonoperational LLW disposal facility shall be monitored by an environmental monitoring program designed to meet the following objectives:

- 1) Measure effluent releases, migration of nuclides, disposal unit subsidence, and changes in parameters that may affect long-term site performance.
- 2) Based on facility characteristics, the program shall include, but not be limited to, monitoring soil, air, surface water, and in the subsurface, soil and water, both in the saturated and unsaturated zones.
- 3) The program shall be capable of detecting changing trends in performance and to ascertain whether or not effluents meet the requirements of DOE Orders.

Finding

The inactive low-level and mixed waste disposal facility in Technical Area III is not being fully monitored and closed in accordance with the requirements of DOE 5820.2A.

Discussion

Management of the low-level and mixed waste disposal facility does not meet the environmental monitoring and closure requirements of DOE 5820.2A. Because the facility did not cease operations until December 1988, after the effective date of DOE 5820.2A, the requirements of this Order are applicable. SNL, Albuquerque, is generally aware of all of these deficiencies and has initiated action to correct them as a part of the RCRA closure activities associated with this facility (I-R-104). The Tiger Team identified the following deficiencies in the management of this facility:

1. A comprehensive plan conforming to NEPA and addressing closure of the facility within 5 years has not been prepared. However, plans to

develop a closure plan in accordance with RCRA have been made and efforts have been initiated.

2. Environmental monitoring is conducted for this facility, but it does not meet all of the requirements of DOE 5820.2A (I-R-59). No monitoring is conducted to measure airborne releases or disposal unit subsidence. Surface runoff and subsurface soil and water, both in the saturated and unsaturated zones, is not routinely monitored. The program is not capable of detecting changing trends in performance.

This finding was not addressed in the PTTSA Report and the ES&H Action Plan.

3.5.4.3 Best Management Practice Findings

FINDING WM/BMPF-1: Development and Submission of RCRA Permit Application

Performance Objective

DOE 5480.19, Conduct of Operations Requirements for DOE Facilities, provides that operating goals should be used as a management tool; that meeting goals should require a definite set of actions in an action plan; that progress toward completing the action plan should be monitored periodically; and, if results show a significant variance from the desired progress in achieving goals, that management should review the action plan to ensure that it is adequate and is being executed.

DOE 5400.2A, Environmental Compliance Issue Coordination, establishes requirements for coordination of significant environmental compliance issues, such as Resource Conservation and Recovery Act (RCRA) permits and permit applications, to ensure timely development and consistent application of Departmental environmental policy and guidance.

RCRA regulations promulgated in 40 CFR 270, and New Mexico Hazardous Waste Management Regulations, Section 902, specify that the owner/operator of a hazardous waste management facility must submit complete and timely RCRA Part A and Part B permit applications.

Finding

There is no formal program to ensure that all RCRA permit applications are submitted to DOE to allow sufficient time for review prior to submission to the State. Additionally, SNL, Albuquerque, has not taken a proactive approach towards the permit application process to expedite approval.

Discussion

SNL, Albuquerque, has been granted Interim Status under two RCRA Part A permit applications: one for the storage and treatment of hazardous waste, and another to store mixed (radioactive and hazardous) waste. SNL, Albuquerque, has recently submitted the fifth revision of a Part B permit application for hazardous waste storage and treatment.

While SNL, Albuquerque, is the operator under the permit application, DOE/KAO is the owner, and is required to sign the applications. Typically, permit applications have been prepared by SNL, Albuquerque, and given to KAO for review and signature. There is often a very short period of time between when KAO receives the permit application for review and when the application is due to the State. For instance, the latest revision to the Part B permit application (Revision 5.0) was prepared by SNL, Albuquerque, and submitted to KAO for signature one week before it was due to the State. Although there was some informal coordination between KAO and SNL, Albuquerque, when the application was being developed, this amount of time was not sufficient to allow for an indepth review by KAO.

A recent example of SNL, Albuquerque's, unresponsiveness to KAO and DOE is SNL, Albuquerque's, failure to provide the chemical waste landfill closure

plan to KAO as required (GW-4) prior to submission of the plan to the New Mexico Environment Department. SNL, Albuquerque, also did not request an extension for the plan submittal date.

In addition, SNL, Albuquerque, KAO, and AL have not taken a proactive approach to the permit application process. For instance, by delaying to accurately complete a Part A permit application for mixed waste until the State of New Mexico obtained authority to regulate mixed waste under RCRA, SNL, Albuquerque, did not act proactively. SNL, Albuquerque, was aware of the approaching requirement to have interim status to store mixed waste in 1987, but did not file a Part A permit application until the summer of 1990. Additionally, SNL, Albuquerque, has not begun preparing the Part B permit application for mixed waste under 40 CFR 270.14 and 270.15 in anticipation of State's request (WM-61 through I-WM-64). For example, SNL, Albuquerque, has yet to develop a finalized waste analysis plan for mixed waste, including laboratory analysis capability; a facility to properly store mixed waste; approved contingency plans for the storage facilities designated in the Part A (there is a draft contingency plan for mixed waste at Technical Area III Radioactive and Mixed Waste Interim Storage Area); a training program for mixed waste; and closure plan for mixed waste facilities (I-WM-1 and I-WM-107) (WM-80).

Finally, Division 3221 has no formal coordination with Division 3223 (Environmental Restoration) concerning the impact that RCRA corrective actions may have on the approval of the permit. Specifically, there is a question as to whether the State of New Mexico will grant a permit until additional progress is made remediating the chemical waste landfill (I-WM-120, I-WM-21, and I-WM-122).

This finding was partially addressed in the PTTSA Report and in the ES&H Action Plan.

FINDING WM/BMPF-2:**Evaluation of Offsite Treatment, Storage, and Disposal Facilities****Performance Objective**

DOE's "Policy on Off-Site Treatment, Storage, and Disposal of Nonradioactive Hazardous Waste" (June 24, 1986) states that appropriate EPA and State officials should be consulted before a contract for offsite hazardous waste treatment, storage, or disposal (TSD) is executed to clarify the compliance status of the TSD facility. The status of facilities under ongoing contracts should be reviewed at least quarterly. Furthermore, best management practice requires that offsite facilities be audited on a periodic basis to ensure that they are operated in compliance with applicable requirements.

Finding

SNL, Albuquerque, does not have formal procedures in place to ensure that regulators are consulted to determine the compliance status of a TSD facility, and that offsite TSD facilities are audited on a periodic basis.

Discussion

In 1987, SNL, Albuquerque, established an unwritten policy to conduct an annual audit of offsite TSD facilities that receive SNL, Albuquerque, hazardous and PCB waste (I-WM-67). Since that time, offsite facilities have generally been audited on an annual basis, although some facilities have been missed in the past year because, according to SNL, Albuquerque, activities being conducted to prepare for the Tiger Team Assessment were given a higher priority (I-WM-67). In lieu of offsite audits, SNL, Albuquerque, contacted AT&T for any information it could provide from its own recent facility audits. When SNL, Albuquerque, does conduct audits, a standardized written checklist is used to complete the audit and document the results. Regulators are generally contacted in conjunction with the annual audit. However, procedures have not been written that formally establish the policy of conducting the audits and that describe requirements for frequency, methodology, documentation, personnel qualifications, regulatory agency consultation, and waste shipment cessation if facilities are not in compliance.

SNL, Albuquerque, was not aware of the DOE policy concerning offsite facilities and, therefore, did not contact regulators prior to entering into contracts and has not continued quarterly compliance checks (I-WM-67). However, as noted above, regulators have generally been contacted in conjunction with the annual audits.

Medical waste from SNL, Albuquerque, is sent to an offsite incinerator and disposal facility. Medical waste is considered a solid waste rather than a hazardous waste in New Mexico, but there are special handling requirements for medical waste within the State solid waste regulations. Because of these requirements, and increased Federal attention to medical waste, best management practice would also require that facility audits and compliance checks be performed for offsite facilities receiving medical waste. SNL,

Albuquerque, does not currently conduct audits or consult regulatory agencies to determine the compliance status of the medical waste offsite facility (I-WM-62).

This finding has not been identified in the PTTSA Report or ES&H Action Plan.

3.5.5 Toxic and Chemical Materials

3.5.5.1 Overview

The objective of the Environmental Subteam assessment of the management of toxic and chemical materials at SNL, Albuquerque, was to evaluate the status of compliance with regulations promulgated under the Toxic Substances Control Act (TSCA), the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), applicable DOE Orders and guidance, and best management practices (BMP). These regulations, Orders, and BMPs establish the requirements for the acquisition, handling, storage, and disposal of toxic and chemical materials. A list of regulations, requirements, and guidelines applicable to toxic and chemical materials is presented in Table 3-7. The Environmental Subteam assessment focused on the management and control of polychlorinated biphenyls (PCBs), chlorofluorocarbons, pesticides, explosives, and laboratory and bulk chemicals. Asbestos management was evaluated with reference to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations, and was included with the air portion of the assessment.

SNL, Albuquerque, includes hundreds of laboratories housed in approximately 550 major buildings and a large number of other buildings, on a site which extends over almost 10,000 acres. Inspections were conducted in a range of facilities including large laboratories, specialized storage areas, and test facilities located in remote areas. Activities performed in the facilities included microelectronics research and process development, analytical chemistry, and explosives storage. The amounts of chemicals used and stored at the various facilities varied from very small (total annual quantity less than 1 quart or 1 pound) to very large quantities of bulk chemicals. The operations at SNL, Albuquerque, were evaluated for compliance in five major areas: PCB management; chlorofluorocarbons (CFCs) management; pesticide/herbicide management; explosives management; and the management of toxic and chemical materials from acquisition to disposal.

PCBs

The current management of PCBs at SNL, Albuquerque, is a well-developed and -implemented program. The complexity of shutting down operations to sample and retrofit or replace transformers has caused some delays in the completion of the pole-mounted transformer project. The retrofit/removal and disposal work is being conducted by a subcontractor. Comprehensive efforts have been made to sample non-transformer, non-capacitor equipment which might contain PCBs. Spills are reported to the regional EPA Administrator in a timely manner. SNL, Albuquerque, works closely with the regional EPA office to develop appropriate cleanup activities for spills or leaks which occur in areas that are difficult to cleanup, such as under large pieces of laboratory equipment.

CFCs

The total amount of CFCs used at SNL, Albuquerque, has been reduced. Directorate 3200 encourages phasing-out the use of CFCs, and line organizations have undertaken projects to identify and use less harmful substitute products. In addition, the Just-in-Time (JIT) system for purchasing chemicals identifies substitute products and encourages requestors to purchase the substitutes rather than the CFC products. CFC use is limited

TABLE 3-7
LIST OF APPLICABLE TOXIC AND CHEMICAL MATERIALS
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
40 CFR 165	Regulations for the Acceptance of Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticide Containers	EPA
40 CFR 171	Certification of Pesticide Applicators	EPA
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions	EPA
40 CFR 122	EPA Administered Permit Programs: National Pollutant Discharge Elimination System	EPA
40 CFR 129	Toxic Pollutant Effluent Standards	EPA
40 CFR 131	Water Quality Standards	EPA
DOE 4330.4A	Maintenance Management Program	DOE
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5480.19	Conduct of Operations	DOE
DOE/EV/06194 Rev. 5	DOE Explosives Safety Manual	DOE

to areas where no suitable substitute has been found. Areas where CFCs are used are clearly identified and staff are knowledgeable about their safe handling.

Pesticides/Herbicides

The pesticide and herbicide activities at SNL, Albuquerque, are managed as two separate contracts. All pesticide applications are performed by a subcontractor. The pesticide contractor is fully licensed, uses properly maintained equipment, stores and disposes of his chemicals properly, and provides detailed reports of the chemicals used and the amounts applied. No pesticides are stored onsite. The pesticide contract is well supervised, but SNL, Albuquerque, does not have written procedures to guide the management of this activity.

Herbicides at SNL, Albuquerque, are applied through two mechanisms: a subcontracted commercial applicator and trained gardeners. The commercial applicator is also properly licensed, and provides detailed reports of the chemicals and amounts used. The gardening staff applies only commercially available consumer herbicide products, which are stored in a locked building in a cabinet with built-in secondary containment. Empty containers are disposed of as hazardous waste. SNL, Albuquerque, does not have written procedures to guide the management of these activities.

Explosives

Explosives at SNL, Albuquerque, are generally well managed, from an environmental standpoint, and properly transported and stored. Inventories are current and available in the proper locations. Staff who handle these materials are knowledgeable, and have a large collection (9 volumes) of Material Safety Data Sheets (MSDS) available to them. There is a project underway to supplement the information on the MSDS with additional information (such as static sensitivity), which is specifically pertinent to explosives. SNL, Albuquerque, currently lacks an Explosives Review Storage Committee, and has not requested a waiver for this requirement. However, the committee is required in the latest revision of the Explosives Program.

Toxic and Chemical Materials

SNL, Albuquerque, does not have a complete, integrated program for the management of toxic and chemical materials. The practice has been to use Safe Operating Procedures as the general form of guidance documents for the handling and use of toxic and chemical materials.

Subcontractors are not adequately supervised for compliance with SNL, Albuquerque, environmental requirements. Toxic and chemical materials stored outside are not always properly stored or inspected, whereas indoor storage for these materials is quite good.

SNL, Albuquerque, has a computerized JIT materials ordering system. The JIT system includes the most commonly ordered chemicals and gases, and is designed to fill requests within 3 hours for rush orders, or 25 hours for regular orders. In addition to the JIT system, the chemicals supplier also provides a special catalog for ordering small quantities of chemicals to enable SNL, Albuquerque, to help keep inventories at a minimum. Requests for chemicals or

gases that present special hazards to the environment are "blocked" in the computerized ordering system to ensure that the order is reviewed and authorized by the designated personnel. Supervisors are provided with monthly reports of all materials ordered for their activities.

SNL, Albuquerque, plans to integrate three computerized chemicals tracking systems (the JIT system, the Superfund Amendment and Reauthorization Act (SARA)-driven Chemical Inventory System, and the waste minimization MinNet reporting system) to create a cradle-to-grave tracking system for toxic and chemical materials onsite. A prototype system is also being tested that includes removals from chemical stores in the larger laboratories so that real-time data will be available for materials in use.

3.5.5.2 Compliance Findings

FINDING TCM/CF-1:

Storage of Toxic and Chemical Materials

Performance Objective

DOE 5400.1, General Environmental Protection Program, Paragraph 5.b, requires that operating contractors conduct their operations in an environmentally sound manner that limits the risks to the environment.

DOE 5480.19(4), Conduct of Operations, requires that the conduct of operations at DOE facilities be managed with an auditable set of requirements, standards, and responsibilities. DOE 5480.19(4.b) specifically requires that procedures be in place to control the conduct of operations.

DOE 5480.19, Attachment 1, Chapter 1, requires that standards for operating activities be integrated into operations department procedures and programs, and Subpart C.1 calls for the inclusion of policy statements, controls, and a delineation of responsibilities in those procedures and standards.

DOE 4330.4A, Maintenance Management Program, Paragraph 8.c, requires the periodic examination of structures (including tanks) to determine their performance characteristics and to identify signs of decreasing performance. DOE 4330.4A.8.d designates that line management, which is assigned direct programmatic responsibility, is responsible for the maintenance programs for all facilities and equipment.

40 CFR 129, Toxic Pollutant Effluent Standards; 40 CFR 122, National Pollutant Discharge Elimination System; and 40 CFR 131, Water Quality Standards, prohibit the degradation of surface water quality. To comply with the intent of these requirements, it is necessary to take steps for the positive control of chemicals to prevent any leaks or spills from reaching a pathway to a surface water source. Such controls might include the use of secondary containment or the storage of materials in a protected area removed from floor drains or surface drainage.

Finding

SNL, Albuquerque, does not have an adequate program in place to ensure that all toxic and chemical substances are being stored in a manner that would prevent a release of these materials to the environment.

Discussion

SNL, Albuquerque, has some mechanisms in place to advise staff about the storage of toxic and chemical materials. General guidance has been transmitted in the ES&H Manual (September 1988, pages 5-12, General Types of (chemical) Storage), ES&H Bulletin No.22 (August 1988, Outdoor Storage of Chemicals, TCM-84) and thorough training courses which are given to hazardous waste generators. Recently, line personnel have received more specific direction through the issuance of a generic standard operating procedure, which they can adopt or adapt for their operations. Nevertheless, although most operations were being conducted in a manner that would prevent or minimize potential spills to the environment, a number of exceptions were noted:

- A written Spill Prevention Control and Countermeasure Plan for nonpetroleum chemicals has not been developed.
- The large aboveground storage vessels for hydrochloric acid and sodium hydroxide located outside the Microelectronics Development Laboratory are not part of a regularly scheduled and documented inspection program.
- Two drums of Naico 1820® (flash point 131 degrees F) were stored on a wooden pallet on the ground in full sunlight. Staff at the Steam Generating Plant were unaware that they can get additional secondary containment installed quickly in response to a work order request (I-TCM-12).
- The area in which the water treatment chemicals are mixed at the Steam Generating Plant does not have secondary containment of sufficient volume to prevent a spill from reaching the drain located next to the mixing area. The drain leads to the sanitary sewer. This drain appeared to have been stained by these chemicals in the past. One of the chemicals is Nalco 19P®, a powdered sulfite for oxygen scavenging to prevent corrosion. The plant personnel notify the city in the event of releases (I-SW-102). A request to redesign this system was submitted in November 1990, and was approved in April 1991 (Project No. 781-91-29) (TCM-86 and TCM-87, I-TCM-102).
- Although awareness of the proper storage procedures for toxic and chemical materials has increased, implementation of these procedures by the operating lines has not been uniform. As an example of problems that continue to exist, in 1990, the Orphan Chemical Program conducted by Division 3221 identified 70 containers which were either in bad condition or had no secondary containment, and 19 containers which were stored less than 10 feet from a road or in the sun without a roof. Such practices increase the potential for releases of these chemicals to the environment.
- Directorate 7800 manages subcontractors for such activities as electrical work and construction projects. However, there is no formal subcontractor training program for the storage and handling of toxic and chemical materials that might be encountered in that work. This lack of training was cited as a concern by subcontractors who were observed improperly disposing of an electrical ballast (in spite of clear guidance from Division 3221 to Directorate 7800) (I-TCM-36), using a rusted drum (with a 5-inch-diameter hole in its top) for diesel fuel storage, and drums of diesel fuel being stored, without secondary containment, on the side of a construction road (I-TCM-116, I-TCM-117).

These findings were not specifically identified in the PTTSA Report, nor in the ES&H Action Plan. ES&H Action Plan items AP-N-01 and AP-N-06 generally address these inadequacies.

FINDING TCM/CF-2:**Pesticide/Herbicide Program****Performance Objective**

The requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) are in 40 CFR 165 and 40 CFR 171. The most pertinent sections of these regulations deal with the licensing of applicators and the disposal of used or empty pesticide containers.

DOE 4330.4A.11.a., Maintenance Management Program, requires that DOE contractors develop, implement, and document the conduct of their maintenance activities, including planning, scheduling, and coordination. One of the stated objectives of the Maintenance Management Program is to develop a cost-effective and efficient program that is consistent with environmental goals.

DOE 5480.19(4), Conduct of Operations, requires that the conduct of operations at DOE facilities be managed with an auditable set of requirements, standards, and responsibilities. DOE 5480.19 (4.b) specifically requires that procedures be in place to control the conduct of operations.

DOE 5480.19 (Attachment 1, Chapter 1) requires that standards for operating activities be integrated into operations department procedures and programs, and Subpart C.1 calls for the inclusion of policy statements, controls, and a delineation of responsibilities in those procedures and standards.

Finding

There are no written standard operating procedures for the Pesticide/Herbicide Programs to ensure that these programs are conducted in an environmentally safe manner.

Discussion

Neither the pesticide application program (Division 7816) nor the herbicide application program (Division 7813) have written Standard Operating Procedures (SOPs) for the management of the programs to ensure that: 1) only licensed applicators are used; 2) only approved pesticides and herbicides are applied; 3) pesticides and herbicides are not over-applied; and 4) either regular or extraordinary application of limited quantities of herbicide treatment by the gardening staff is conducted only by trained staff, in specified areas, and in specified amounts.

Currently, both programs use licensed subcontractors who are familiar with the site, although trained gardening staff provide limited weed control treatment as part of their groundskeeping activities. Although no environmentally unsafe practices were observed, the lack of SOPs for the management of these two programs means that the continuation of the current practices cannot be ensured.

These findings were not identified specifically in the PTSA Report nor in the ES&H Action Plan.

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3.5.6 Quality Assurance

3.5.6.1 Overview

The object of the quality assurance (QA) portion of the Environmental Subteam assessment at SNL, Albuquerque, was to assess the status of the Environmental Quality Assurance Program in accordance with DOE Orders, and national consensus QA standards, such as ANSI/ASME NQA-1. QA activities were specifically evaluated in accordance with DOE 5400.1, General Environmental Protection Program, DOE 5480.19, Conduct of Operations, and DOE 5700.6B, Quality Assurance, as well as accepted industry practices and standards of performance. A list of applicable QA regulations, requirements and guidelines is presented in Table 3-8. The assessment was accomplished through interviews with key employees; inspection of pertinent SNL, Albuquerque, facilities; observation of environmental monitoring activities; and review of documents, procedures, and QA/quality control (QC) records.

The assessment of SNL, Albuquerque, quality assurance practices was coordinated with other Environmental Subteam specialists to ensure that all potential quality assurance problems, related to environmental programs, were identified. The consensus reached by the Environmental Subteam through its assessment is that an Environmental Quality Assurance Program is not implemented throughout all operations at SNL, Albuquerque.

SNL, Albuquerque, has developed an Environmental QA Program utilizing the 18 Basic Requirements of ANSI/ASME NQA-1. The responsibility for environmental QA is assigned to the Environmental Safety and Health Directorate (3200) with key responsibilities resting within the Environmental Programs Department (3220). The Environmental QA Program Plans are in place. These plans define the key roles, responsibilities, and activities of the program. Procedures covering the specific requirements of the program are not fully implemented throughout the facility. Many of the implementing procedures exist only in unapproved draft versions. The Environmental Subteam identified many areas where environmental QA procedures were lacking. Some of these areas represent key elements of the program. Without implementing procedures in place, the Environmental Quality Assurance Program does not meet the requirements of DOE 5700.6B.

In January, 1991, the Pre-Tiger Team Self-Assessment (PTTSA) Report found that the Quality Plans throughout SNL are not in compliance with DOE 5700.6B. Since that time, SNL, Albuquerque, has undertaken a major effort to develop and implement a uniform environmental QA program sitewide. It is evident that the basic structure of a QA program is in place. The ES&H QA Program Manual has been implemented. The program plans for the areas of key responsibility, Directorate 3200 and Department 3220, are in place. Roles and responsibilities have been defined. ES&H coordinators have been assigned from each functional area (e.g., purchasing) to provide oversight of ES&H activities. The roles and responsibilities of the coordinators are not adequately defined.

With the initiation of the jumpstart program, SNL, Albuquerque, began sitewide self-assessment activity. A program of internal audit and independent appraisal of the ES&H program at SNL, Albuquerque, is under development. It is anticipated that implementation, once initiated, will take several years.

TABLE 3-8
LIST OF APPLICABLE QUALITY ASSURANCE
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5700.6B	Quality Assurance	DOE
DOE 5480.19	Conduct of Operations Requirements for DOE Facilities	DOE
DOE 1324.5	Records Management Program	DOE
AL 5700.6B Revision II	General Operations Quality Assurance	AL
NQA-1	Quality Assurance Programs Requirements for Nuclear Facilities	ANSI/ASME
ES&H Manual Volume 14	Sandia National Laboratories ES&H Quality Assurance Program	SNL

The corrective action system to accompany the audit and appraisal program is under development.

With the new emphasis on the Environmental Program, many procedures were generated. With the proliferation of new procedures, weaknesses in training in the use of the new procedures were detected. The widespread use of unapproved draft procedures was credited to the lack of training in the requirement that procedures be approved prior to use. SNL, Albuquerque, has assessed its training needs and is applying a graded approach to training. A priority list of training needs has been developed with those subjects of greatest environmental impact and widest site applicability receiving highest priority.

Environmental monitoring activities are performed by SNL, Albuquerque, and by contractor personnel. Many of the monitoring activities are performed using unapproved draft procedures.

The calibration of environmental monitoring equipment is not consistently performed throughout SNL, Albuquerque. In several instances, the standards used to calibrate field monitoring instruments are not traceable to national standards or the traceability of these standards has been lost. The procedures defining the calibration of monitoring equipment are inadequate to cover all environmental monitoring activities. Training in the application of calibration procedures has not been initiated.

Environmental monitoring samples are sent to contracted laboratories for analysis. SNL, Albuquerque, procedures require that analyses be performed by laboratories that have been surveyed and approved by SNL. Several instances were found where contracts for onsite environmental services were used to send samples for analysis by laboratories that had not been approved by SNL. In reviewing the performance of the approved analytical laboratories, instances were found where variabilities detected in check samples (spikes and blanks) were never investigated. These bring the validity of data from the contracted laboratories into question.

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3.5.6.2 Compliance Findings

FINDING QA/CF-1:

ES&H Records Management Program

Performance Objective

DOE 1324.5, Records Management Program, sets forth the DOE policy for records management programs. Section 5.b.2 requires the development and application of standards, procedures, techniques, and technology designed to ensure the maintenance, security, and preservation of and access to records of continuing value. Section 6.b.2 requires that departmental records be maintained and used in an effective, efficient, and authorized manner.

DOE 5400.1, General Environmental Protection Program, requires that a Quality Assurance Program consistent with DOE 5700.6B be established covering each element of environmental monitoring and surveillance programs.

DOE 5700.6B, Quality Assurance, states that ANSI/ASME NQA-1 is the preferred standard for quality assurance in nuclear facilities.

AL 5700.6B, Revision II, General Operations Quality Assurance, states that ANSI/ASME NQA-1 shall apply to general operations or support activities.

ANSI/ASME NQA-1, Basic Requirement 17, specifies that "records that furnish documentary evidence of quality shall be specified, prepared, and maintained. Records shall be legible, identifiable, and retrievable. Records shall be protected against damage, deterioration, or loss. Requirements and responsibilities for record transmittal, distribution, retention, maintenance, and disposition shall be established and documented."

Finding

Practices of the SNL, Albuquerque, Environmental Programs Department (3220) do not ensure the maintenance, security, preservation of, and access to records of continuing value.

Discussion

As a DOE facility, SNL, Albuquerque, is required to demonstrate environmental compliance. It is only through the coordinated management and protection of environmental records that the validity of monitoring data can be supported.

The following specific deficiencies were observed in environmental responsibilities for records management:

1. The environmental records center is in an office trailer. The master files are maintained in metal cabinets which are not fireproof. The building structure cannot support the quantity of fireproof file cabinets required to contain the master files (I-QA-2 and I-QA-5).
2. The construction of the facility housing the records center does not meet the minimum requirements for fire protection as set forth in NQA-1. In the absence of fire protection, duplicate copies of

the records are not filed in a remote location (I-QA-5).

3. Environmental monitoring records remain in the custody of the monitoring personnel. These records are maintained in non-fire-rated cabinets in office areas that do not meet the minimum requirements for fire protection and security (I-QA-2).
4. There is inadequate security to prevent unauthorized removal of environmental records from the records library. On several occasions during the Tiger Team Assessment, the area was found to be unoccupied with the door open. The file cabinets were unlocked and open.
5. The inventory of environmental records is incomplete. Although it is up to date for items in the records center, there is no inventory of records stored with monitoring personnel (I-QA-5).
6. The records management policies and procedures are under development and are available in draft form (I-QA-4, I-QA-5, and I-QA-78).

This finding was identified in the PT TSA Report and the ES&H Action Plan.

FINDING QA/CF-2:

Environmental Quality Assurance Audit and Appraisal

Performance Objective

DOE 5400.1, General Environmental Protection Program, requires that a quality assurance program consistent with DOE 5700.6B be established covering each element of environmental monitoring and surveillance programs.

DOE 5700.6B, Quality Assurance, and AL 5700.6B, Revision II, General Operations Quality Assurance, require that an effective quality assurance program include independent verification of quality attainment and quality assurance program effectiveness.

DOE 5700.6B further requires that internal quality assurance audits be performed as a primary activity by any organization that implements quality assurance criteria or requirements, such as DOE laboratories.

DOE 5700.6B also states that in the nuclear area, ANSI/ASME NQA-1 is the preferred standard for quality assurance.

AL 5700.6B, Revision II, General Operations Quality Assurance, states that ANSI/ASME NQA-1 shall apply to general operations on support activities.

ANSI/ASME NQA-1 Basic Requirement 18 specifies that "planned and scheduled audits shall be performed to verify compliance with all aspects of the quality assurance program and to determine its effectiveness. These audits shall be performed in accordance with written procedures or checklists by personnel who do not have direct responsibility for performing the activities being audited."

Finding

SNL, Albuquerque, does not have a formal program implemented for conducting audits of the Environment, Safety and Health Directorate (3200) to ensure program effectiveness.

Discussion

The performance of audits is a key indicator for monitoring the effectiveness of a quality assurance program; because of the lack of current reliable audit data it is very difficult to objectively measure quality attainment in the ES&H Directorate.

The following specific deficiencies were observed in the program for auditing and appraising ES&H activities:

1. Audits of the ES&H Directorate (3200) have not been performed by the ES&H Regulatory Assessment Division (3201) (I-QA-57 and I-QA-58).
2. The Environmental Programs Department (3220) Quality Coordinator has not performed internal audits of the Environmental Programs Department (I-QA-18).

3. The Quality Improvement Directorate (7300), which has responsibility for reviewing quality attainment throughout SNL, has not performed any audits of the ES&H Directorate (3200) (I-QA-3, I-QA-15).
4. Although a sitewide audit procedure contained within the Quality Improvement Plan, Tier 2 (QA-40) has been available in draft since February 25, 1991, no line-specific audit plans or procedures have been released or implemented (I-QA-3 and I-QA-15).
5. No written checklists have been generated for performing audits of the Environmental Department functions (I-QA-15, I-QA-18, and I-QA-57).
6. No schedules have been developed for performance of audits on a periodic basis (I-QA-15, I-QA-18, and I-QA-57).

Self-assessment and independent audit permit the detection and correction of weaknesses and deficiencies at an early level when corrective actions would require minimal effort. Without audit data, deficiencies might not be detected until the impact is significant when the remediation effort would be costly and time consuming.

This finding was identified in the PTTSA Report and the ES&H Action Plan.

FINDING QA/CF-3:**Calibration of Measuring and Test Equipment Used for Environmental Monitoring****Performance Objective**

DOE 5400.1, General Environmental Protection Program, requires that a Quality Assurance Program consistent with DOE 5700.6B be established covering each element of environmental monitoring and surveillance programs.

DOE 5700.6B, Quality Assurance, requires that plans and actions to assure quality achievement shall be established, implemented, and maintained with primary emphasis on achieving a high degree of operational success and with due consideration to health and safety, environmental protection, performance, reliability, and other concerns.

DOE 5700.6B further indicates that quality objectives should be defined in terms of measurable characteristics. Independent measurements should provide means for determining the extent to which the quality objectives are met and for identifying and correcting deficiencies. To obtain measurements that are independent and reliable, data must be taken in a manner that is uniform and controlled using equipment that is suited for the degree of accuracy required.

DOE 5700.6B states that in the nuclear area, ANSI/ASME NQA-1 is the preferred standard for quality assurance.

AL 5700.6B, General Operations Quality Assurance, states that ANSI/ASME NQA-1 shall apply to General Operations or Support Activities.

ANSI/ASME NQA-1, Basic Requirement 12, states that "tools, gages, instruments and other measuring and test equipment used for activities affecting quality shall be controlled and at specified periods calibrated and adjusted to maintain accuracy within necessary limits." This requires that measuring and test equipment shall be calibrated, adjusted, and maintained at prescribed intervals or, prior to use, against equipment having known relationships to nationally recognized standards. If no nationally recognized standards exist, the bases for calibration shall be documented. Calibrations shall be performed in accordance with documented instructions. Records shall be maintained and equipment shall be suitably marked to indicate calibration status.

Finding

Calibration procedures in place at SNL, Albuquerque, do not cover all environmental monitoring equipment.

Discussion

The following specific observations are indicative of programmatic and procedural deficiencies observed in the calibration and use of environmental monitoring equipment:

1. During a soil monitoring demonstration at an underground storage tank site adjacent to Building 875 (Technical Area I), a 300-gram weight was used to calibrate an electronic scale. The scale indicated 299.5 grams. The weight had no indication of

calibration status and was not traceable to national standards (I-QA-2).

2. The draft monitoring procedure (QA-34) for the activity described in (1.), requires that a calibrated balance or scale accurate to a tenth of a gram is required to perform the procedure. Even though the calibration procedure used did not assure that the scale was accurate to procedural requirements, the monitoring personnel proceeded with the activity (I-QA-2).
3. During the recalibration activity on April 24, 1991, the radiation safety monitor panel in the control room of the Annular Core Research Reactor (ACRR) in Building 6588 (Technical Area V) displayed an expiration date of April 20, 1991. This equipment, which is required by the technical specification for the reactor, monitors the release of radionuclides at various areas throughout the ACRR. The operator of the ACRR urged that calibration be postponed so that reactor operation could be resumed. However, operation of the reactor was not resumed until the calibration had been completed. The Division 3213 supervisor stated that there was an undocumented policy permitting the extension of an expiration date to the end of the month for nonportable equipment (I-QA-40). He further indicated that this practice would be prohibited in the ES&H Manual, Chapter 7, which is to become effective June 1, 1991 (I-QA-37 through I-QA-40).
4. During the calibration of the Particulate, Iodine, and Noble Gas Continuous Air Monitoring system at the ACRR, which is an air flow critical monitoring system, the hot-wire anemometer used to monitor air flow was not calibrated. In fact, the anemometer had never been calibrated because no calibration procedure had been generated. The remainder of the system was calibrated using instructions derived from the manufacturer's manual. These instructions had never been consolidated into a formal controlled document (I-R-254).
5. During wastewater monitor calibration at sites WW004, WW006, and WW007, the pH buffer solutions used for the calibration of the pH monitors were stored in bottles marked only with the solution pH reading. The monitoring personnel indicated that the solutions had been drawn from manufacturer's containers containing traceability data such as expiration date and lot number. By not transferring the data, the traceability is lost and the accuracy of the reading cannot be supported (I-QA-16, I-QA-17, and I-QA-35).
6. During the wastewater monitoring activity described in (5.), the electronic monitoring equipment and chart recorders installed at the monitoring sites had no indication of calibration status. The SNL, Albuquerque, calibration program requires (QA-36 and QA-37) a sticker bearing the calibration expiration date, the statement "no calibration required," or the statement "calibrate before use" (I-QA-16 and I-QA-17).

This finding was identified in the PTTSA Report and the ES&H Action Plan.

FINDING QA/CF-4:**Procurement Process for Materials and Services****Performance Objective**

DOE 5400.1, General Environmental Protection Program, requires that a Quality Assurance Program consistent with DOE 5700.6B be established covering each element of environmental monitoring and surveillance programs.

DOE 5700.6B, Quality Assurance, states that plans and actions to assure quality achievement shall be established, implemented, and maintained with primary emphasis on achieving a high degree of operational success and with due consideration to health and safety, environmental protection, performance, reliability, and other concerns. DOE 5700.6B states that in the nuclear area, ANSI/ASME NQA-1 is the preferred standard for quality assurance.

AL 5700.6B Revision II, General Operations Quality Assurance, states that ANSI/ASME NQA-1 shall apply to general operations or support activities.

ANSI/ASME NQA-1, Basic Requirement 4, specifies that "applicable design bases and other requirements necessary to assure adequate quality shall be included or referenced in documents for procurement of items and services to the extent necessary. Procurement documents shall require suppliers to have a quality assurance program consistent with the applicable requirements of this Standard."

ANSI/ASME NQA-1, Basic Requirement 7, states "The procurement of items and services shall be controlled to assure conformance with specified requirements. Such control shall provide for the following as appropriate: source evaluation and selection, evaluation of objective evidence of quality furnished by the supplier, source inspection, audit, and examination of items or services upon delivery or completion."

Finding

A uniform system is not in place at SNL, Albuquerque, to ensure that environmental quality requirements are applied to the procurement of materials and services.

Discussion

To maintain a valid and defensible position regarding environmental compliance, data accumulated through the use of contracted laboratories must be scientifically accurate and derived using recognized or approved procedures. To ensure the continued accuracy of laboratory services, the analytical source must be qualified and approved. The procurement process must ensure that only qualified sources are used.

During the review of the process for procuring materials and services, the following specific deficiencies were observed:

1. Current procurement procedures do not require that purchase requisitions be reviewed for environmental quality requirements. A procedure under development by Directorate 3700 (QA-39) will require such review (I-QA-28 through I-QA-34).

2. A subcontract for onsite PCB handling services (QA-45) does not contain a clause requiring that any subcontractors used by the contractor be approved by SNL, Albuquerque, or have a quality program meeting the requirements of NQA-1 (I-QA-59).
3. The subcontract referenced in (2.) above is being used as the method to place orders for analysis of oil samples for PCBs with a laboratory that has neither been evaluated nor approved for use by SNL, Albuquerque. This laboratory is being used for quick turnaround analysis. All samples submitted to this laboratory are verified through duplicate samples submitted to a fully qualified laboratory before any environmental restoration or waste disposal decisions are made. The concern is that a contracting mechanism exists to bypass qualification procedures (I-QA-59).
4. An existing subcontract for onsite services (QA-44) was used to send radiological samples to a contractor-owned laboratory for analysis. This laboratory had not been evaluated or approved by SNL, Albuquerque, for such analyses (I-QA-8 and I-QA-48).

This finding was not identified in the PT TSA Report but was addressed in the ES&H Action Plan.

FINDING QA/CF-5:**ES&H Directorate (3200) Corrective Action Program****Performance Objective**

DOE 5400.1, General Environmental Protection Program, requires that a Quality Assurance Program consistent with DOE 5700.6B be established covering each element of environmental monitoring and surveillance programs.

DOE 5700.6B, Quality Assurance, requires that effective quality assurance programs include a system for early detection and correction of deficiencies and further requires that causes of significant deficiencies be identified and corrected to prevent recurrence.

DOE 5700.6B states that in the nuclear area, ANSI/ASME NQA-1 is the preferred standard for quality assurance.

AL 5700.6B, General Operations, Quality Assurance, requires the implementation of programs and work instructions for the elements of an effective quality assurance program, and states that ANSI/ASME NQA-1 shall apply to general operations and support activities.

ANSI/ASME NQA-1, Basic Requirement 16, states "conditions adverse to quality shall be identified promptly and corrected as soon as practical. In the case of a significant condition adverse to quality, the cause of the condition shall be determined and corrective action taken to preclude recurrence. The identification, cause, and corrective action for significant conditions adverse to quality shall be documented and reported to appropriate levels of management; followup action shall be taken to verify implementation of this corrective action."

Finding

The Environmental, Safety and Health Directorate (3200) does not have a documented program for determining cause and implementing corrective action for conditions adverse to ES&H quality.

Discussion

A corrective action system is the backbone of an effective quality management program. Through the careful determination of cause, corrective action can be implemented that will prevent recurrence of conditions adverse to quality. Through the tracking of corrective actions taken, the effectiveness of these actions can be monitored. The following specific deficiencies were observed in the ES&H Directorate (3200) corrective action system:

1. The ES&H Directorate (3200) has a corrective action document titled "The ES&H Directorate 3200 Corrective Action Report" (QA-46). There is no procedure for the preparation, use, tracking, or review of the form (I-QA-70).
2. The Environmental Programs Department (3220) has a corrective action document titled "The Environment Programs 3220 Corrective Action Form" (QA-47). There is no procedure for preparation, use, tracking, or

review of the form (I-QA-70).

3. The ES&H Directorate (3200) has a form (QA-50) for the reporting and tracking of ES&H findings. This information is maintained in a database as part of the ES&H Corporate Information System. No procedure has been generated for the preparation, use, tracking, or review of the form. The ES&H Corporate Information System is still under development and implementation and the strategic plan (QA-49) for this system is in draft form (I-QA-69 and I-QA-71).
4. There is no formal system for determining cause and corrective action for faulty procured items and services. A discrepancy reported in a check sample analysis done by a contracted analytical laboratory which was reported in the 1989 Environmental Monitoring Report (QA-15) has never been investigated (I-QA-7 and I-QA-73 through I-QA-75).

In an effort to rectify the lack of an organized corrective action system, SNL, Albuquerque, has taken several steps toward implementing a corrective action system:

1. The Environmental Programs Department (3220) is implementing a system for the tracking of findings within the department. The system is in the development phase but has been documented in a plan (QA-46) controlled within the department (I-QA-53 and I-QA-54).
2. The ES&H system for reporting and tracking of findings is to come under the direction of the ES&H Regulatory Assessment Division (3201) when the self-assessment program is implemented (I-QA-57).

This finding was identified in the PTTSA Report and the ES&H Action Plan.

FINDING QA/CF-6:**Use of Procedures****Performance Objective**

DOE 5400.1, General Environmental Protection Program, requires that a Quality Assurance Program consistent with DOE 5700.6B be established for each element of environmental monitoring and surveillance programs.

It is the objective of DOE 5700.6B, Quality Assurance, to establish an independent, institutional coordination and overview function to develop and coordinate quality assurance policies and overall guidelines.

AL 5700.6B, General Operation Quality Assurance, requires that documented quality assurance programs, quality program plans, and implementing procedures be maintained which prescribe the system of management controls on activities, services, and items to ensure achievement of quality objectives of DOE programs.

DOE 5700.6B states that in the nuclear area, ANSI/ASME NQA-1 is the preferred standard for quality assurance.

AL 5700.6B states ANSI/ASME NQA-1 shall apply to general operations or support activities.

ANSI/ASME NQA-1, Basic Requirement 5, specifies that "activities affecting quality shall be prescribed in and performed in accordance with documented instructions, procedures, or drawings of a type appropriate to the circumstances."

ANSI/ASME NQA-1, Basic Requirement 6, specifies that "the preparation, issue, and change of documents that specify quality requirements or prescribe activities affecting quality shall be controlled to assure that correct documents are being employed. Such documents, including changes thereto, shall be reviewed for adequacy and approved for release by authorized personnel."

Finding

Activities affecting environmental quality and compliance are being performed using unapproved procedures.

Discussion

Activities must be performed using approved procedures in order to demonstrate environmental compliance. Through the procedure approval process, as described in GN47000, A Guide to Writing Activity Specific ES&H Standard Procedures, procedures are reviewed and signed off by representatives from the environmental areas and management to determine technical accuracy and suitability. During the Tiger Team Assessment, the Environmental Subteam found situations where procedures had remained in unapproved draft form for more than 1 year.

During the months prior to the Tiger Team Assessment, SNL, Albuquerque, undertook an effort to bring the Environmental Program into compliance. This effort resulted in the generation of numerous implementing procedures. Many

of these procedures have not undergone formal review and approval and are marked as draft; however, most of them have been put into use.

During the review of activities related to environmental quality and compliance, the following programmatic and procedural deficiencies were observed:

1. The Chemical Waste Landfill Sampling and Analysis Plan (QA-64) is being used in unapproved draft form. The procedure has been in final draft form since February 5, 1990.
2. The Waste Analysis Plan for Radioactive and Mixed Wastes (QA-65), which is to serve as a portion of the RCRA Part B Permit Application, is marked as a preliminary draft copy. This procedure has been used in its unapproved form since March 1990.
3. Some procedures in use for chemical waste disposal (QA-59) are marked draft and have no approval signatures.
4. The procedure used for underground storage tank soil monitoring (QA-34) is in draft form and exhibits no approval signatures.
5. The sampling plan used for wastewater monitoring (QA-60), which contains the field operating procedures for wastewater monitoring, is a draft document with no approval signatures. The field operating procedures contained within the sampling plan have not been approved.
6. The procedures used to document the operation of the corporate ES&H document control procedure (QA-61, QA-62) are not written in the normal document format and do not exhibit evidence of review for accuracy. The procedure used within Directorate 2800 (QA-62) does not display any approval signatures.
7. The procedure for generation and approval of sampling plans (QA-63) is in draft form and has not been approved.

During discussions with the Director, Environmental Safety and Health (3200) (I-QA-83) and the Quality Coordinator, Environmental Programs Department (3220) (I-QA-84), it was stated that SNL, Albuquerque, policies require that procedures must be approved before use. Lack of sitewide training in the use of procedures was given as the reason for the widespread use of unapproved procedures. It was indicated that need for such training is being given high priority by the SNL, Albuquerque, corporate training organization.

This finding was addressed in the PT TSA Report and the ES&H Action Plan.

FINDING QA/CF-7:

Environmental Incident Reports

Performance Objective

DOE 5480.19, Conduct of Operations Requirements for DOE Facilities, Chapter XI, Paragraph C.4, requires that record entries should be made in a manner such that they can be easily read and understood. Paragraph C.5 requires that a standardized method for correcting any erroneous entries should be established. Entries should not be erased or covered up. Corrections can be made by placing a single line through the incorrect entry and writing the correct entry in a nearby space. All corrections should be initialed and dated.

The SNL, Albuquerque, ES&H Quality Assurance Program (QA-56) requires that records be legible, accurate, complete, and reproducible. The program further requires that all cross-outs remain legible, be initialed and dated, and that no correction fluid or correction tape be used on the records.

The SNL, Albuquerque, Environmental Programs Department (3220) Quality Plan (QA-29) requires that corrections to records be initialed (or signed) and dated by the person making the corrections in a manner that does not completely obliterate the incorrect entry. Correction fluid is not allowed on QA records.

Finding

The Environmental Programs Department (3220) Environmental Incidents Forms are not prepared or corrected in accordance with the requirements of DOE 5480.19 or SNL, Albuquerque, procedures.

Discussion

In 1989, personnel in Division 3221 instituted an internal program for documenting oil spills at SNL, Albuquerque. In 1990, the program was expanded to include not only oil spills but chemical spills as well. A standard documentation form for recording information concerning a spill was developed and implemented to help ensure timely reporting and corrective action. While the program is in place, the documentation has many problems which call into question the validity, accuracy, and usefulness of the data.

During the review of documentation (SW-72), the following issues were noted:

- Inconsistent entries in an information block (e.g., the name of the person involved would be entered on some forms and, on other forms, the title and organization were entered).
- Some forms had been completed by multiple individuals (as indicated by the different handwriting) with no identification or date of entry. The inability to trace the entries to specific individuals or the date on which the information was entered may lead to questions concerning the validity and accuracy of the information.
- Multiple copies of a single report were evident. In some cases not all of the information had been consolidated on both the

original document and copies. This limits the ability of a reviewer to follow the sequence of activities and be assured that the report is complete.

- The entries are handwritten and information is often illegible. While the use of handwritten entries are not necessarily of concern, it is important that legibility be maintained.
- Post-it™ notes containing information relative to the incident were placed on some forms. These were not labelled as to which incident they related to, so there is the likelihood that information would be lost should the notes drop off.
- The section that is required to be completed by personnel in Department 3220, which denoted whether the incident was reportable and whether any action taken, was not always completed.
- Information on followup/remedial actions was not consistently provided.
- Corrections were made by cross-outs and comments but were neither initialed nor dated.

The conformance to good documentation practices and adherence to a formal process are keys to providing accurate and useful documentation of such events.

This finding was addressed in the PTTSA Report and the ES&H Action Plan.

3.5.7 Radiation

3.5.7.1 Overview

The environmental radiation portion of the Environmental Subteam assessment consisted of evaluating current operational practices and programs at SNL, Albuquerque, to determine compliance with the documents listed in the Tiger Team Manual, applicable Federal and State regulations, and DOE Orders. The programs were also reviewed against the DOE/EH-0173T Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance and against commonly accepted best industry practices and standards of performance. The assessment included interviews with SNL, Albuquerque, employees; inspection of selected SNL, Albuquerque, facilities and locations; and review of documents, procedures, and records associated with environmental radiation programs. The Environmental Subteam found no activity that poses immediate and unacceptable radiation safety risk to the public. Table 3-9 lists applicable environmental radiation protection DOE Orders and guidelines that were used during the conduct of this assessment.

As a part of the environmental radiation protection assessment, reviews were coordinated with other Environmental Subteam Specialists to ensure that all potential environmental radiation problem areas were identified and evaluated. Reviews were coordinated with the Water Specialist, to evaluate effluent monitoring and release control programs; the Groundwater Specialist, to evaluate sources of potential groundwater contamination from historical and present releases of radioactive liquids, and existing soil contamination; the Quality Assurance Specialist, to assess environmental program oversight and control; and the Waste Specialist, to assess the adequacy of radioactive waste management, storage, and disposal. Environmental radiation protection findings are included in the report sections of other specialists, as appropriate.

Environmental radiation programs were categorized into six areas for the purpose of this assessment as follows: environmental surveillance, effluent monitoring, radioactive waste management, decontamination and decommissioning (D&D), release of contaminated real and personal property, and radiological design criteria.

The radiological environmental surveillance program at SNL, Albuquerque, consists largely of annual sampling and analysis of soil, vegetation, and water, and direct radiation measurements. The scope of the existing program is not comprehensive enough to evaluate the impact of SNL, Albuquerque, operations on the environment, and the program basis is not formalized or documented. Monitoring of radioactive waste storage areas is not adequate and the site has made little progress toward developing and implementing an Environmental Monitoring Plan. In addition, the site lacks formal methods and dedicated equipment to perform emergency preparedness environmental surveillance and plume tracking. Although the site is aware of program deficiencies, it has not yet been able to implement any significant improvements.

Radiological effluent monitoring programs and controls were reviewed for both airborne and liquid radioactive contaminated effluents. Liquid and airborne radioactive effluents at the site are minimal and are well below the derived concentration guides. The site is developing a program to evaluate all

**TABLE 3-9
LIST OF APPLICABLE RADIATION
REGULATIONS/REQUIREMENTS/GUIDELINES**

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.5	Radiation Protection Of The Public And The Environment	DOE
DOE 5480.1B	Environment, Safety, and Health Program For DOE Operations	DOE
DOE 5480.5	Safety Of Nuclear Facilities	DOE
DOE 5480.6	Safety OF DOE Owned Nuclear Reactors	DOE
DOE 5480.11	Radiation Protection For Occupational Workers	DOE
DOE 5480.19	Conduct Of Operations	DOE
DOE 5481.1B	Safety Analysis And Review System	DOE
DOE 5482.1B	Environmental, Safety, And Health Appraisal Program	DOE
DOE 5484.1	Environmental Protection, Safety, And Health Protection Information Reporting Requirements	DOE
DOE 5500.3	Reactor And Nonreactor Nuclear Facility Emergency Planning, Preparedness, And Response Program For DOE Operations	DOE
DOE 4700.1	Project Management System	DOE
DOE 5700.6B	Quality Assurance	DOE
DOE 5820.2A	Radioactive Waste Management	DOE
DOE 6430.1A	General Design Criteria	DOE
DOE/EH-0173T	Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance	DOE

potential release points and is in the process of identifying all air and liquid effluent release points. There is no formal effluent monitoring and the site does not meet the requirements of 40 CFR 61 for airborne emissions of radionuclides. The liquid effluent monitoring program does not adequately control batch releases and does not include sufficient sampling and analysis.

Operations in the areas of radioactive waste generation, storage, treatment, disposal, and volume reduction were evaluated. The site generates small volumes of remote-handled and contact-handled transuranic waste. However, there is no Waste Isolation Pilot Plant certification program for these wastes and storage facilities are inadequate.

Moderate volumes of low-level radioactive and mixed waste are also generated. In general, conduct of operations for handling these wastes requires improvement. The site currently has no approved method to dispose of these wastes and existing facilities to store, treat, and reduce volume are inadequate. Low-level and mixed waste programs are being developed and implemented, and several actions have been initiated to construct new facilities. In addition, SNL, Albuquerque, has made application to the Nevada Test Site for approval to dispose of low-level and mixed wastes at that site.

An evaluation of D&D activities was performed for new, operational, and surplus facilities at SNL, Albuquerque. There are only a few facilities that will require major D&D efforts and none of these is planned to be shut down in the near future. However, there are also a number of smaller facilities and portions of larger facilities that will require D&D. Neither SNL, Albuquerque, nor DOE has a formal program to implement DOE D&D requirements for new, operational, and surplus facilities. However, the site has initiated some preliminary efforts to develop a program.

SNL, Albuquerque, manages a number of different radioactively contaminated real properties (land and structures) both inside and outside of the Technical Areas. In addition, contaminated personal property (property other than real property) is generated at a number of different locations around the site. Current programs are not adequate to manage, administratively control, survey, and release contaminated real and personal property. Consequently, real and personal property may be released for unrestricted use or disposal when it does not meet the release limits of DOE 5400.5 Radiation Protection of the Public and Environment. In addition, posting, signage, and access control of contaminated outdoor areas is not adequate.

An evaluation was performed of the methods used to incorporate environmental design criteria into new facilities and facility modifications. The Safety Analysis process was also evaluated to determine if environmental impacts are properly evaluated and controlled. Both the Environmental Programs Department and the Facilities Engineering Department have responsibilities to ensure implementation of environmental design criteria. Although they are aware of their responsibilities, they are still in the process of developing and implementing a formal program to control these activities. In addition, there is no formal process to ensure that all operational and physical changes are evaluated to determine if they constitute an unreviewed safety question related to environmental impact. Safety Analyses have been prepared for all

nuclear reactors and operating nuclear facilities and are currently being revised. A Safety Analysis is being prepared for a new nuclear facility (Radioactive and Mixed Waste Management Facility); however, not all facilities that require a Safety Analysis have one.

3.5.7.2 Compliance Findings

FINDING RAD/CF-1: Liquid Radiological Effluent Monitoring

Performance Objective

DOE 5400.1, General Environmental Protection Program, Chapter IV, Section 5.a, states that effluent monitoring shall be conducted at all DOE sites to verify regulatory requirements and DOE Orders; determine compliance with commitments made in official documents; evaluate the effectiveness of effluent treatment and control; identify potential environmental problems; and detect, characterize, and report unplanned releases. The Order states that effluent monitoring shall be conducted to provide representative measurements of the quantities and concentrations of pollutants in liquid discharges.

DOE 5400.1, Chapter IV, Section 10, requires that a quality assurance program consistent with DOE 5700.6B be established covering each element of environmental monitoring. Minimum elements of the quality assurance program are also specified.

DOE 5400.5, Radiation Protection of the Public and the Environment, Chapter II, Section 2.d, establishes the following requirements for discharges of liquid radioactive waste to sanitary sewers: application of best available technology if discharges exceed 5 times the discharge concentration guides; coordination with the operators of the publicly owned treatment works (POTW); implementation of controls so that long-term build-up of radionuclides in solids will not present a problem at sewage disposal plants; and limitation of the total annual exposure to members of the general public to no more than a small fraction of the limit.

DOE 5400.5, Chapter II, Section 2, requires that a program be developed to implement the as low as reasonably achievable (ALARA) process for liquid effluents.

Finding

SNL, Albuquerque, does not have an adequate program for monitoring and controlling continuous and batch discharges of liquid radiological effluents to ensure that all releases meet the requirements of DOE Orders.

Discussion

Liquid effluent monitoring for radioactive materials in continuous and batch liquid discharges is not conducted in a comprehensive manner that ensures releases are within regulatory limits. In addition, these discharges are not controlled under a sitewide formal program (I-R-14, I-R-6, I-R-10, I-R-11, and I-R-98). This finding applies to continuous and batch releases to the POTW, and batch releases to the soil.

The following specific deficiencies were identified:

1. There are no procedures nor formal sitewide guidance that establish the monitoring and control requirements for these types of releases. Requirements are not established for obtaining representative samples,

types of analysis, concentration limits, and lower limits of detection. Action levels are not specified; there are no provisions for trending or tracking release concentrations; and there is no effluent release Quality Assurance Plan. There is a draft Waste Water Sampling and Analysis Plan (R-36) for Technical Area V batch releases.

2. There is no formal mechanism for identifying all of the potential release points or controlling them under a single authorized organization. In addition, the Tiger Team has identified that some liquid process releases are discharged directly to the storm drain system (SW-74, -57, -61, -62, -63, and -64) (I-SW-68). All such releases have not been identified and monitored as appropriate.
3. Continuous discharges to the POTW are not monitored for radioactive contaminants at the source or at the three existing sampling stations. There is little segregation of sink and floor drain lines in facilities that work with radioactive materials, and in all but the newest facilities, all of these lines discharge to the POTW. Although disposal of radioactive contaminated liquids down these drains is prohibited, discharges can occur occasionally and the potential exists for an inadvertent discharge. Monitoring is not conducted to ensure the discharge requirements of the Order are met.
4. The batch releases of radioactively contaminated liquids to soil is not positively controlled under a signature authorization system. The requirements for sampling, analysis, obtaining release authorization, and documentation of a batch discharge are not defined. Batch releases to the soil will be phased out when SNL, Albuquerque, receives permission from the city of Albuquerque to discharge batch releases to the POTW. Releases to the POTW will have to be controlled under the same requirements and meet the derived concentration guides specified in DOE 5400.5.
5. SNL, Albuquerque, does not have a formal ALARA program for radioactive liquid effluents. Funds have been budgeted to purchase a portable sampler to monitor effluents from specific buildings to identify primary release sources so that ALARA may be applied to those releases.
6. There is no documented system to ensure that potentially contaminated septic tank sludge is not disposed of as clean waste. SNL, Albuquerque has identified all of the septic systems with a high potential for radioactive contamination (I-R-101). Environmental Programs Department (3220) has notified the Engineering V Division (7845) (I-R-105) not to pump out the suspect septic tanks in Technical Area V. This notification was not formal and it does not address potentially contaminated septic systems that were identified in other Technical Areas.

This finding was partially addressed in the PTTSA Report and the ES&H Action Plan.

FINDING RAD/CF-2:**Certification of Compliance with DOE Order 5400.5****Performance Objective**

DOE 5400.5, Radiation of the Public and the Environment, required that by April 8, 1990, Heads of Operations Offices provide the following to the Program Office, with a copy to EH-1 for review and comment: a certification for those areas covered by the Order for which Site/Operations Offices are in compliance; and/or a request for exemption for areas that were not yet in compliance with the Order, including a plan for achieving compliance. By May 8, 1990, the Program Office was to have submitted to EH-1 the certification and/or request for exemptions. The Compliance Plan accompanying the request for exemption was to include schedules of activities which would lead to compliance with the requirements of this Order. The areas covered by this Order include public dose limits, the as low as reasonably achievable (ALARA) process, radioactive materials in liquid discharges, phaseout of soil column discharges, radioactive solid waste, release of contaminated equipment and property, compliance with dose limits, and reporting requirements.

Finding

The certification of compliance and request for exemption regarding SNL's compliance with DOE 5400.5 were not prepared and submitted to EH-1 in accordance with the requirements of that Order.

Discussion

DOE 5400.5 established requirements for the preparation and submittal, by May 8, 1990, of a certification for those areas of the Order for which SNL, Albuquerque, is in compliance and a request for exemption for areas that were not yet in compliance. The Tiger Team identified the following deficiencies in the SNL, Albuquerque, certification and request for exemption (I-R-1, -73, -78, and -107):

1. A certification response was prepared by SNL, Albuquerque, (R-31) and submitted to AL on May 25, 1990. It was eventually submitted to the Program Office on January 25, 1991; however, AL failed to meet the DOE 5400.5 requirement for submission to the Program Office by April 8, 1990.
2. A copy of the response (R-31) was not transmitted to EH-1 by AL when it was submitted to the Program Office.
3. The response prepared by SNL, Albuquerque, (R-31) was not submitted to EH-1 by the Program Office until April 16, 1991 which did not meet the May 8, 1990, date required by DOE 5400.5.
4. The Tiger Team identified the following deficiencies in the response prepared by SNL, Albuquerque (R-31):
 - The report contained both a certification of areas in compliance and a description of noncomplying areas, which is a variance from the required format.

- A request for exemption for those areas of noncompliance was not included in this or any other report.
 - Based on SNL, Albuquerque's, evaluation, the report certified that the management of low-level radioactive solid waste is in accordance with DOE 5400.1 and 5820.2A. However, the Tiger Team assessment identified that low-level radioactive solid waste management does not meet all of the requirements of those Orders (see Findings GW/CF-2, WM/CF-19, WM/CF-20).
5. A formal compliance plan including a schedule of activities that would lead to compliance with the requirements of the Order was never prepared as required. The SNL, Albuquerque, response (R-31) contains a short summary of activities and an approximate completion date for some of the noncomplying areas; however, this does not constitute a formal plan and schedule. Planned actions to correct some of the deficiencies are detailed in Activity Data Sheets for the Site-Specific Plan

This finding was not addressed in the PTTSA Report and the ES&H Action Plan.

FINDING RAD/CF-3:**Liquid Discharges to Previously Contaminated Areas****Performance Objective**

DOE 5400.5, Radiation Protection of the Public and the Environment, Section 6.b, states that it is DOE's objective to protect the environment from radioactive contamination to the extent practicable. Chapter 1, Section 5.a, requires that additional controls on the release of liquid waste be adopted to reduce the potential for radiological contamination of natural resources such as land, groundwater, and surface water, and ecosystems. Chapter II, Section 2, requires that contractors implement the as low as reasonably achievable (ALARA) process for all DOE activities that cause public dose.

DOE 5400.5, Chapter II, Section 3, states that controls are imposed on liquid releases to protect resources such as land, surface water, groundwater, and the related ecosystems from undue contamination. Section 3.c. states that liquid discharges even though uncontaminated, are prohibited in inactive release areas to prevent the further spread of contamination. DOE 5400.5, Chapter II, Section 3.e, states that DOE activities that cannot comply shall develop interim control strategies with adequate documentation identifying the alternatives considered and evaluations thereof. Such strategies shall be adopted and implemented by August 8, 1990, and shall be reevaluated every 2 years thereafter.

Finding

The SNL, Albuquerque, Annular Core Research Reactor, Hot Cell Facility, and certain septic systems release liquid discharges to soil that was previously contaminated with radioactive material. These discharges are not being managed in accordance with the requirements of DOE 5400.5.

Discussion

SNL, Albuquerque, has several types of liquid discharges that are considered to be continuing liquid discharges to soil previously contaminated with radioactive material. Such releases are prohibited under the requirements of DOE 5400.5 and are required to be phased out. Although plans have been developed and several different actions initiated to address this issue (R-28) (I-R-14), these actions do not meet all of the requirements of DOE 5400.5. SNL, Albuquerque, did not develop interim control strategies for these types of releases that included documentation of the alternatives considered and the evaluations thereof. In addition, interim control strategies were not implemented by August 8, 1990, as required, and there is no definitive schedule to phase out these releases.

The following SNL, Albuquerque, releases are considered to be continuing liquid discharges to soil previously contaminated with radioactive material:

1. Batch releases are made of radioactively contaminated water from the Hot Cell facility holding tanks to the surface impoundment (R-26 and R-27). Current discharges are below the derived concentration guides (DCGs). Historically, these discharges had much higher concentration discharges when the Sandia Engineering Reactor operated in this building (I-R-79);

however, there are inadequate records of these historical releases to determine if they were greater than the DCGs.

2. Batch releases are made of primary reactor coolant from Annular Core Research Reactor to the french drain and discharge ditch behind the facility. Current discharges are below the DCGs; however, records of historical releases are inadequate to demonstrate that these discharges did not exceed the DCGs in the past.
3. SNL, Albuquerque, has identified a number of septic systems around the site with a significant potential for radioactive contamination (I-R-101). Although the septic fields currently receive only uncontaminated liquids, it is likely that they received radioactively contaminated liquids in the past.

This finding was fully addressed in the PTTSA Report and the ES&H Action Plan.

FINDING RAD/CF-4:**Release of Radioactively Contaminated Real Property****Performance Objective**

DOE 5400.5, Radiation Protection of the Public and the Environment, Chapter II, Section 5, establishes the requirements for the release of real property. Release of real property (land and structures) shall be in accordance with Chapter IV of this Order and shall apply to both DOE-owned facilities and to private properties that are being prepared by DOE for release.

DOE 5400.5, Chapter IV, presents radiological protection requirements, provides guidelines for cleanup of residual radioactive material and management of the resulting wastes and residues, and describes requirements for release of property. DOE field organizations shall develop plans and protocols for the implementation of this guidance. The monitoring, cleanup, and control of residual radioactive material are subject to as low as reasonably achievable (ALARA). Residual radioactive material above the guidelines shall be managed in accordance with the following requirements: (1) access to and use of residually contaminated property should be administratively controlled; (2) property may be maintained under an interim management arrangement; and (3) the administrative controls include but are not limited to periodic monitoring; shielding; physical barriers; and appropriate measures during activities that might disturb the residual radioactive material or cause it to migrate.

Finding

Current programs at SNL, Albuquerque, for the release of radioactively contaminated real property are not sufficiently detailed or formalized to ensure that this property is controlled and released in accordance with the requirements of DOE 5400.5.

Discussion

Operations at SNL, Albuquerque, have or may result in the radioactive contamination of real property within areas owned by the DOE, within areas controlled by the DOE (Coyote Test Field), and within areas permitted for DOE use by other Federal entities. Radioactively contaminated personal property may also be generated within any of these locations. Programs for the control and release of real property are not formalized, well defined, and effectively implemented. The following specific deficiencies were identified:

1. The KAO Coyote Range Committee (CRC) reviews and controls activities within DOE withdrawn land (Coyote Test Field) and the cable facility (I-R-116). The Tiger Team did not observe any evidence indicating inadequate control over contaminated property in these areas. However, this committee does not operate under a formal charter nor does it have procedures that describe how it operates, how its interface with all organizations using these areas, and how it ensure that activities within contaminated areas are controlled. The minutes of the first meeting provide a description of the committees purpose.
2. Activities within the permitted areas are controlled by the Air Force, defined in the permits, and they are reviewed by KAO. Many of these

permitted areas are radioactively contaminated and contain environmental restoration sites. The permits for use of these areas must be periodically renewed or the land turned back to the controlling agency. The permit renewal may be denied or an existing permit revoked by the Air Force at any time, with reasonable notification. Neither DOE nor SNL, Albuquerque, has a formal plan or mechanism for releasing the property in these cases that addresses characterization, cleanup to regulatory limits, administrative controls if not cleaned up, documentation requirements, and certification that the property is clean. Revocation of a permit has only occurred for the Technical Onsite Inspection Facility and for the Old Cable Facility. The documentation, cleanup, and control of the transfer of the Old Cable Facility was not adequate and subsequent activities at that site negatively impacted the environmental restoration area and may have resulted in the uncontrolled spread of contamination to previously clean areas and new facilities.

3. All buildings under the control of SNL, Albuquerque, are coordinated by the Planning Division (7821) (I-R-111). Surplus space and facilities are returned to them when the owning organization no longer has a need for the space. Division 7821 issued a memorandum (R-22) that requires the ES&H Directorate (3220) to survey and release such space before Division 7821 takes possession. This policy is not formal and there are no procedures and standards that define the interface with Departments 3210 and 3220 or ensure that the policy is consistently implemented. There is no established guidance on what to do if the facility is contaminated, such as cleanup, use with administrative controls, etc.
4. It is possible for building ownership to be directly transferred within a directorate or between directorates without going through Division 7821 (I-R-111). Such transfers are controlled by the Building Facilities and Planning Committee but are not required to be released by Departments 3210 and 3220 prior to transfer. Such transfers require the same controls as the property transfers described in item 3. above.
5. Departments 3210 and 3220 has no formal program, procedures, or methods defining how release surveys are performed, including the following: necessary surveys, verification that contamination is below regulatory release limits, documentation of the process, certification of compliance with regulatory limits, etc. (I-R-97 and I-R-113). In addition, there is no quality assurance program governing these activities.
6. Department 3220 has a policy of evaluating and releasing all septic systems when the input lines are rerouted to the publicly owned treatment works and they are deactivated. However, there are no procedures that describe how this release process occurs and is documented (I-R-14).
7. There is no well defined and integrated mechanism to ensure that future activities involving dispersal of radioactive material outdoors will be controlled, once they have been identified. Controls are necessary to ensure that the contamination is either removed or the area controlled

in a manner that complies with DOE 5400.5. The site will be aware of such activities through its established NEPA program.

This finding was fully addressed in the PTTSA Report and the ES&H Action Plan.

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FINDING RAD/CF-5:**Environmental Monitoring Plan****Performance Objective**

DOE 5400.1, General Environmental Protection Program, Chapter II, Section 4, requires that a written Environmental Monitoring Plan (EMP) shall be prepared and implemented no later than November 11, 1991. The EMP shall be approved by the appropriate Head of Field Organization, or designee. The plan shall identify and discuss two major activities: effluent monitoring and environmental surveillance. The plan shall reflect the importance of monitoring as a critical element of an effective program. Section 6 requires that a meteorological information/monitoring program be developed as a specific element of all EMPs. Section 9 requires that a groundwater monitoring plan shall be developed as a specific element of all EMPs. Section 10 requires that a quality assurance plan be established covering each element of environmental monitoring programs.

Finding

Adequate and timely actions were not taken by AL and SNL, Albuquerque, to implement the requirements of DOE 5400.1 for development and implementation of an EMP, consequently an environmental monitoring program meeting the requirements of DOE 5400.1 will not be implemented within the time period required by DOE Order.

Discussion

SNL, Albuquerque, did not initiate any significant effort to develop and implement the EMP until 1991. SNL, Albuquerque, had not yet received any specific guidance from AL or instructions to proceed with development during the time of the Tiger Team Audit (R-46). A contract for preparation of the document was not issued until May of 1991, 2.5 years into the allotted 3 year period (I-R-59).

The purpose of the EMP is to provide the basis for the development and implementation of radiological and nonradiological effluent monitoring and environmental surveillance programs; a meteorological monitoring program; and a groundwater monitoring program as required by DOE 5400.1. The project plan for Preparation of the EMP (R-43) does not call for completion until August 30, 1991, leaving only 2 months to implement an environmental monitoring program that meets the requirements of DOE 5400.1. The project plan does not address the meteorological monitoring program. Previous schedules for development of the EMP, described in the 1989 and 1990 environmental implementation plans (I-R-47 and I-R-48) have slipped badly. The results of the Tiger Team assessment (see Findings GW/CF-2, RAD/CF-1, A/CF-4, A/CF-5, and A/CF-6) demonstrated that the existing programs in these areas are deficient and require significant improvement before they can comply with DOE 5400.1. The site cannot begin to implement new programs that comply with the requirements or the Order without the EMP since its purpose is to define all of the elements of an acceptable program. Based on this information it is apparent that the site cannot possibly implement an environmental monitoring program that meets all of the requirements of DOE 5400.1 by November 11, 1990, as required.

This finding was fully addressed in the PTTSA Report and the ES&H Action Plan.

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FINDING RAD/CF-6:**Environmental Contamination Control****Performance Objective**

DOE 5480.11, Radiation Protection for Occupational Workers, Section 8, defines a controlled area as any area to which access is controlled in order to protect individuals from exposure to radiation and radioactive materials. It defines a radiological area as any area within a controlled area where surface contamination levels are greater than those specified in Attachment 2 of this Order.

Section 9.g requires that workplaces shall be routinely monitored, as appropriate, for identification and control of potential exposure sources. It also requires that appropriate instruments and techniques shall be used to provide contamination monitoring and control. Workplace surfaces outside radiological areas shall be maintained essentially free of removable contamination, but in any case, contamination shall not exceed the levels defined in Attachment 2 of the Order. Workplace surface areas in radiological areas shall be posted and controlled as appropriate.

Section 9.k requires that access to any controlled area where radioactive materials or elevated radiation fields may be present, shall be clearly and conspicuously posted as a controlled area. It also requires that the access to any area where surface contamination levels greater than 10 times those specified in Attachment 2 are present shall be clearly and conspicuously posted with a sign that identifies the radiological conditions that exist.

Section 9.l requires that an appropriate entry control program shall be established for radiological areas.

DOE 5400.5, Radiation Protection of the Public and the Environment, Section 6, states that it is the objective of DOE to protect the environment from radioactive contamination to the extent practicable.

Finding

The SNL, Albuquerque, program to determine the extent of contamination and to post and control access to outside areas that are contaminated with radioactive materials has not been fully developed and implemented.

Discussion

There are many outdoor locations at SNL, Albuquerque, both inside and outside of the Technical Areas, that are known, or suspected, to be contaminated with uranium and/or tritium (R-1, R-6, and R-25). These areas have been identified as environmental restoration sites and many are still active, although current activities may differ from those that caused the initial contamination. There is no program to prevent the spread of contamination from or control access to these areas. SNL, Albuquerque, is planning to address many of these issues as a part of its Environmental Restoration Program, but no significant actions have occurred to date. The Tiger Team identified the following specific deficiencies:

1. None of these areas have been adequately characterized and surveyed to determine if they are controlled areas, radiological areas, and

contaminated areas as defined by DOE 5480.11. The areas identified in various reports (R-1, R-6, and R-25) include the Red Horse Area, Building 9927, Shock Tube Area, and the Technical Area III sled tracks.

2. There is no adequate mechanism to prevent access to these areas. Some areas are fenced but no surveys were performed to ensure that the fence includes all of the contaminated area.
3. Without any specific information, areas suspected of radioactive contamination must be managed as contaminated in accordance with the requirements of DOE 5480.11. However, none of these areas are posted and access is not controlled as required by that Order. A draft procedure has been prepared to address these issues (R-35) but has not yet been implemented.
4. The program to perform routine surveys or inspections of these areas has not been finalized or implemented.
5. There is no program to measure the spread of contamination from these areas.
6. No engineering controls have been planned or implemented to minimize the spread of contamination due to resuspension or surface water runoff except at the inactive low-level and mixed waste landfills in Technical Areas II and III.
7. The Tiger Team observed small animal prints and burrows indicating animal intrusion into the inactive low-level and mixed waste landfill in Technical Area III which may result in the spread of contamination.
8. All construction activities are handled by the Facilities Directorate (7800) through a Request for Facilities Support Program (R-14). However, some activities such as minor earth moving and grading in Technical Area III may be conducted outside of this program (I-R-114). These types of activities can take place in contaminated areas and can result in the uncontrolled spread of contamination. The Tiger Team observed an occurrence of this situation at the new Sled Track Facility in Technical Area III which uncovered loose, depleted uranium contamination that had been buried.

This finding was partially addressed in the PTTSA Report and the ES&H Action Plan.

Performance Objective

DOE 5484.1, Environmental Protection, Safety, and Health Protection Information Reporting Requirements, Change 5, dated March 15, 1989, was in effect prior to the issuance of the 1989 Annual Environmental Monitoring Report. Chapter III, Section 4.b, states that the environmental monitoring report shall summarize the results of monitoring to determine compliance with applicable effluent standards and permit conditions. Effluent monitoring data for pollutants shall be included in the report. The total number of curies in airborne and liquid effluents released to the offsite environment and the nuclides of interest shall be included. Section 4.c requires that the report shall include for each sampling station the number of samples taken with an indication of the central tendency and spread of the data. This should include mean, maximum, and minimum concentrations, two standard deviations, and percent of standard for each parameter. The environmental report shall contain an assessment of the potential radiation exposure to the public. The assessment shall be as accurate and realistic as possible. The assessment should provide realistic estimates of the "fence post dose rate," maximum organ, average dose to critical organs and whole body dose to the population within 50 miles. The modeling and calculational methodology should be included or referenced.

DOE 5700.6B, Quality Assurance, requires that a Quality Assurance Plan contains or references the quality assurance elements for a project and describes how conformance with such requirements is assured for computer software and its operation.

Finding

The 1989 Environmental Monitoring Report for SNL, Albuquerque, does not contain all required information, and the dose assessments do not meet the requirements of DOE 5484.1.

Discussion

The 1989 report (R-2) contains all of the major elements required by DOE Orders; however, there are some instances in which the supplied information does not fully comply with the requirements. This report was approved by DOE HQ; however, the following deficiencies were identified by the Tiger Team:

1. The report does not attempt to quantify potential fugitive radioactive releases including: airborne tritium from the Technical Area III mixed waste disposal facility, resuspension of contaminated soil, and stormwater runoff. The potential for these types of releases has been previously reviewed and identified in the Environmental Survey Report and the RCRA Facility Assessment Report (R-1, R-25).
2. The assessment of doses from the airborne pathways did not include the fugitive emissions described above.
3. Potential liquid radioactive release pathways exist such as publicly owned treatment works (POTW) releases and stormwater runoff; however, the dose from these pathways was not evaluated. These pathways must

either be demonstrated to be negligible in comparison to other pathways or the dose must be calculated.

4. The software used to perform the offsite dose assessment calculations has not been verified and validated under a formal Quality Assurance Plan and there is no SNL, Albuquerque, procedure that describes its use.
5. The report provides very little comparison with historical data and information on historical trending.

This finding was partially addressed in the PTTSA Report and the ES&H Action Plan.

FINDING RAD/CF-8:**Outdoor Storage of Contaminated Materials****Performance Objective**

DOE 5820.2A, Radioactive Waste Management, Chapter III, Section 2, requires that low-level waste operations be managed to ensure that no legacy requiring remedial action remains after operations have been terminated. Section 3.a states that DOE low-level waste that has not been disposed of prior to issuance of this Order (September 26, 1988) shall be managed on the schedule developed in the Implementation Plan to accomplish the Performance Objectives of the Order.

DOE 5400.5, Radiation Protection of the Public and the Environment, Section 6.b, states that it is DOE's objective to protect the environment from radiation to the extent practical.

Finding

SNL, Albuquerque, currently stores known and potentially radioactive contaminated materials outdoors in a manner that may not adequately protect the environment from the release of radioactive contamination.

Discussion

Outdoor storage of potentially contaminated material does not meet the storage requirements of DOE 5820.2A and can lead to contamination of the environment that will require future remediation. SNL, Albuquerque, does not have any established prohibitions against this type of storage. The following specific instances of outdoor storage were identified and others may exist:

1. CEARP Area 18 (R-6) in the southeast quadrant of Technical Area III is an outdoor storage area for miscellaneous material, some of which is contaminated or radioactive (I-R-49). This area was operational during the Tiger Team assessment but was shut down by SNL, Albuquerque, after it was identified as a concern by the Tiger Team (R-37); however, the material still remains in the storage yard.
2. The West Reapplication Yard was found to contain radioactive contaminated material stored outdoors. Although not specifically classified as waste by SNL, Albuquerque, the potential for re-use of contaminated material is remote.
3. CEARP Area 19 (SWMU 65) (R-6 and R-26) in the Coyote Test Field is an outdoor storage area for miscellaneous debris at least some of which is contaminated with radioactive material (I-R-26) that meets the DOE 5400.5 release limits. SNL, Albuquerque, has received guidance from AL to release the material. Although, storage at this material meets DOE 5400.5 requirements it would be a best management practice to dispose of the material as soon as practicable.

This finding was not addressed in the PTTSA Report and the ES&H Action Plan.

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FINDING RAD/CF-9:**Post-Accident Radiological Environmental
Surveillance and Dose Assessment****Performance Objective**

DOE 5500.3, Reactor and Nonreactor Nuclear Facility Emergency Planning, Preparedness and Response Program for Department of Energy Operations, Section 10, requires a site-specific radiological emergency response plan for reactor and nonreactor nuclear facilities. A site-specific plan is required for facilities with a potential for a "Site Emergency Level" or greater. Section 6.a.2 defines a site emergency as the actual or likely release offsite, of radioactive materials, not exceeding protective response recommendations. The purpose of the site emergency level is to assure that appropriate monitoring teams are dispatched, and to provide current information to DOE and for consultation with offsite officials and organizations.

DOE 5500.3, Attachment 1, establishes the minimally acceptable criteria for the development of emergency action plans and procedures for radiological emergencies. Planning and preparedness requirements include the following: designating specific individuals for performing essential roles; assuring that provisions exist for prompt communication among principal response organizations; ensuring that adequate facilities and equipment are provided and maintained; ensuring that adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences are available; and ensuring that training programs are provided for all personnel having emergency responsibilities.

Finding

The SNL, Albuquerque, emergency preparedness plans and procedures do not establish the methods and procedures to be used for post-accident radiological surveillance and environmental assessment.

Discussion

The existing SNL, Albuquerque, Emergency Preparedness Master Plan (R-60) and associated sector plans (R-61) contain no detailed guidance on quantifying, tracking, and evaluating onsite and offsite consequences. These capabilities are necessary because some of the facilities in Technical Area V have the potential to release significant amounts of material onsite and measurable amounts offsite. Efforts are currently under way to upgrade the existing plans to meet the requirements of draft DOE 5500.3A.

The following specific emergency preparedness deficiencies were identified by the Tiger Team:

1. The computer and other analytical methods for calculating plume dispersion and dose impact are not specified.
2. Sources of information for estimating the release source term are not specified and no methods are defined to use field measurements to back-calculate a source term.
3. Methods and procedures to survey the plume, both onsite and offsite, are

not specified for the following: direct radiation measurement of the passing cloud and deposition; ambient air sampling; soil, water, vegetation, food, and milk sampling; and provisions to analyze collected samples. Interface with other agencies for offsite assessment is not specified.

4. Equipment and facilities necessary to perform these functions are not described in plans or procedures, such as computers to run the plume model, vehicles for survey team, and survey equipment. There are no provisions to ensure that required equipment is available and operational.
5. The emergency preparedness plan has no implementing procedures.
6. The emergency preparedness plan training program is designed to ensure that emergency personnel are trained in all areas of the plan. Items 1 through 5 above are not included in the emergency plan so training in these areas is not included in the training program.

This finding was not addressed in the PTTSA Report or the ES&H Action Plan.

FINDING RAD/CF-10:**Radioactive Effluent/On-Site Discharge Reports****Performance Objective**

DOE 5400.1, General Environmental Protection Program, Chapter II, Section 5.a requires that Radioactive Effluent and On-site Discharge Data Reports (known as ODIS Reports) covering the previous calendar year be submitted annually to the Waste Information Systems Branch by April 1. The report is to be prepared and submitted in accordance with the Effluent Information System and On-site Discharge Information System User's Manuals. Field Organizations are to ensure that any errors are reported promptly to the Waste Information Systems Branch.

The Instructions for DOE Form F-5821.1 (rev. 11-80) and the Effluent Information System (EIS) and Onsite Discharge Information System (ODIS) User's Manual specify that all organizations releasing liquid and airborne radioactive wastes are required to complete the form for all emission points, onsite radioactive waste discharge points, and unplanned releases. In addition, individual pollutants must be identified for each onsite discharge or effluent stream.

Finding

SNL, Albuquerque, does not have a program or procedure to ensure that ODIS Reports are accurately completed and include all airborne and liquid discharges from Laboratory facilities. As a consequence, ODIS Reports for calendar years 1988, 1989, and 1990 do not comply with the requirements of DOE 5400.1 and the instructions on DOE Form F-5821.1.

Discussion

1. The 1988, 1989, and 1990 ODIS Reports did not discuss all of the released radionuclides, or list incorrect nuclides (R-217, R-218, and R-246). For example:
 - a) The 1988 report only addressed atmospheric emissions from three facilities, the Annular Core Research Reactor, the Sandia Pulsed Reactor, and HERMES III. The report failed to include liquid discharges from the Annular Core Research Reactor, and atmospheric emissions from the Hot Cell Facility; Buildings 835, 935, 906; and other radiological facilities.
 - b) The 1989 report for the Hot Cell Facility had a nuclide incorrectly listed, which is apparently a typographical error. Stable Xenon-131 is a nonradioactive species which is incorrectly listed on the ODIS Report. The correct radionuclide should have been recorded as Xenon-131m, the "m" is apparently missing from the listing.
 - c) The selection rationale for reporting radionuclides emitted from the Hot Cell Facility is not clear. Xenon-133, which has a half-life of 5.2 days, and Xenon-135, which has a half-life of 9.1 hours were reported on the ODIS Reports. However, iodine isotopes with similarly short half-lives and fission yields are not listed

on this report. The 1990 report did not include tritium emissions from Building 835, nor liquid releases from the Annular Core Research Reactor.

2. Preparation, submission, management, and DOE overview of the ODIS Reports is deficient:
 - a) The 1988, 1989, and 1990 reports contain cross-outs, write-overs, and in some cases, the entries are not very legible.
 - b) The 1988 report was sent to the Waste Information Systems Branch on May 2, 1989, approximately 1 month past the due date.
3. KAO has not identified or corrected any of the errors noted above, as required in DOE 5400.1.

This finding was not identified in the PT TSA Report or the ES&H Action Plan.

FINDING RAD/CF-11:**Environmental Aspects of Safety Analysis****Performance Objective**

DOE 5481.1B, Safety Analysis and Review System, Section 7.c, states that the objective of the safety analysis preparation and review process is to assure that potential hazards are systematically identified and the potential consequences are analyzed. Chapter I, Paragraph 3.a, requires that a safety analysis be initiated at the earliest phases of the project life cycle. Section 4 requires a backfit review to be performed, on all ongoing DOE operations, to identify facilities having the potential for major onsite or offsite impacts. Section 2 states that this Order is applicable to DOE operations that involve hazards that are not routinely encountered and accepted in the course of everyday living by the vast majority of the general public. Section 4 requires that the safety analysis shall address probability of occurrence and predicted consequences of hazards, and physical design features and administrative controls provided to prevent or mitigate potential accidents. Section 4 also requires that proposed physical and administrative changes be evaluated to determine if they result in unreviewed safety questions.

DOE 5480.5, Safety of Nuclear Facilities, Section 6, requires that this Order be applied to the siting, design, construction, maintenance, operation, modification, and decommissioning of a nuclear facility. Section 8 establishes detailed requirements for new and existing nuclear facilities including Safety Analysis Reports and operational safety requirements. Section 9 requires that an internal safety review system be established and maintained for nuclear facilities. It also requires that it provide technical competence in the areas being reviewed.

DOE 5480.6, Safety of DOE-Owned Nuclear Reactors, Section 6, requires that this Order be applied to DOE-owned nuclear reactors. Section 8 requires a Safety Analysis Report and technical specifications for each reactor. Section 8.g requires that an independent review and appraisal system be established and maintained. It also requires that the committee provide technical competence in the areas being reviewed.

Finding

There is no SNL, Albuquerque, sitewide safety analysis and review program and no SNL, Albuquerque, organization performs the oversight function for implementing the environmental Safety Analysis requirements of DOE Orders.

Discussion

A safety analysis includes an evaluation of potential accidents including an assessment of the probability of occurrence and predicted consequences to the environment and the public. Physical design features and administrative controls provided to prevent or mitigate potential accidents are also included in the emergency plan. Operational and physical changes to facilities may invalidate the assumptions used to evaluate and control impacts on the public and the environment. This site has developed a plan (R-63) and has initiated several actions to improve control over safety analyses (R-62 and R-65); however, they do not address all of the deficiencies identified in this finding.

SNL, Albuquerque, has three types of Safety Analyses: nuclear, nuclear reactor, and others. There is no sitewide guidance or single organization responsible for the quality, maintenance, and overview of the environmental impact aspects of these documents. However, the Environmental Safety and Health Directorate (3200) has plans to create a risk assessment organization with responsibilities in this area (R-63) (I-R-1 and I-R-102). The following deficiencies were identified by the Tiger Team:

1. The need for a Safety Analysis is identified for a new facility by the Facilities Management Division (7823). However, their formal guidance and procedures are not adequate to ensure that a Safety Analysis is performed for all facilities as required. The facility owner then develops the Safety Analysis, including the environmental impact sections, without formal guidance or independent oversight.
2. A backfit analysis was not performed for existing SNL, Albuquerque, facilities to determine if additional safety analyses are required.
3. Except for nuclear facilities and nuclear reactors, there is no program that ensures a review of facility physical and operational changes to determine if they constitute an unreviewed environmental impact safety question. Unreviewed safety questions may require modification of an existing Safety Analysis, a new Safety Analysis where one was not previously required, or the elimination of an existing Safety Analysis.
4. The Sandia Radiological and Criticality Safety Committee (SRCSC), along with the Technical Area V Radiological and Criticality Safety Committee (RCSC), were established to satisfy the requirements of DOE 5480.5 for independent review of nuclear facilities (R-67 and R-68). Responsibilities of these committees include review of physical and operational changes for impact on Safety Analyses. These Safety Analyses include environmental impacts but no one from the Environmental Programs Department (3220) serves on these committees to provide this type of technical competence.
5. DOE 5840.5 establishes requirements for nuclear facilities. The Radioactive Mixed Waste Management Facility was designated as a nuclear facility on January 15, 1991, after initial construction efforts were completed. Modifications are currently being designed for this facility, and documents are being prepared to support its operation; however, the SRCSC is not involved in any of these activities as required by DOE 5480.5 even though the Radioactive Mixed Waste Management Facility is a nuclear facility (I-R-102).
6. The Sandia Reactor Safety Committee (SRSC) and additional groups chartered by it were established to meet the requirements of DOE 5480.6 for independent review of nuclear reactors (R-69 through R-71). All Reactor Safety Analysis Reports are currently being revised, including the environmental impact sections, and standards for format and content are under development. The program for revision, review, approval, and periodic update of these Safety Analysis Reports is not defined in procedures.
7. It is not clear what role the new Risk Assessment Department in 3200 will have in relation to the existing committees, the Project Management

Division (7823), and groups within the Reactor Development and Applications Department (6450) that develop Safety Analysis Reports.

This finding was partially addressed in the PTTSA Report and the ES&H Action Plan.

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FINDING RAD/CF-12:**Environmental Review of Operational and Facility Changes****Performance Objective**

DOE 5400.1, General Environmental Protection Program, Chapter IV, Section 3, requires pre-operational studies for new facilities with the potential for significant environmental impact. This study should begin not less than 1 year, and preferably 2 years, before startup.

DOE 5400.5, Radiation Protection of the Public and the Environment, Chapter II, Section 2, requires that the as low as reasonably achievable (ALARA) process be considered in facility design.

DOE 5820.2A, Radioactive Waste Management, Chapter III, requires that all design developments incorporate waste minimization principles. Chapter V requires that planning for facility decommissioning shall be initiated during the design phase for new facilities.

DOE 6430.1A, General Design Criteria, provides specific guidance for incorporating radiological controls; effluent controls and monitoring; decontamination and decommissioning; and ALARA into facility designs. Special DOE facilities, such as those containing radioactive materials, have additional design criteria.

Finding

The Environmental Programs Department (3220) has not fully developed and implemented a program to ensure that all facility modifications, new facilities, and facility operational changes are evaluated to determine compliance with applicable regulatory requirements and their impact on existing environmental programs.

Discussion

Department 3220 is responsible for implementing a number of SNL, Albuquerque, programs to provide compliance with DOE Orders and regulatory requirements. Consequently, they must be aware of all operational and facility changes that may impact existing programs so that appropriate modifications to the programs can be implemented. Department 3220 implements provisions to receive some of the information it needs and other mechanisms are being implemented to provide even more information (I-R-1 and I-R-113). However, Department 3220 does not receive all of the information required and they do not have a formal review program to ensure that this information is obtained and reviewed for compliance and impact on all of Department 3220 areas of responsibility.

1. There are no procedures that define how receipt of operational and facility change information is documented, disseminated, tracked, and closed-out. There is no formal review process which provides documented evidence that this information is reviewed for its impact against the full range of programs and environmental responsibilities within the department.
2. Information regarding facility modifications is received through the Request For Support (RFS) program (R-14). However, this mechanism does

not ensure that notification occurs for all applicable modifications (see Finding RAD/CF-15). A single point of receipt is not established for this information.

3. Commensurate with the notifications provided in item 1 above, Department 3220 is responsible for ensuring that all environmental criteria are implemented for these projects. However, the Tiger Team identified that requirements such as decontamination and decommissioning, pre-operational monitoring, and general design criteria were not implemented for recent projects (I-R-97 and I-R-67), such as the Strategic Defense Facility and the Radioactive and Mixed Waste Management Facility.
4. There is no mechanism by which Department 3220 is notified of administrative and operational changes so that they can be reviewed (I-R-113). The ES&H Manual (R-20) will provide some required notifications and the planned Risk Management Organization will provide another source of information. However, neither of these mechanisms is implemented as yet.

This finding was not addressed in the PTTSA Report and the ES&H Action Plan.

FINDING RAD/CF-13:**Program for Decommissioning Contaminated Facilities****Performance Objective**

DOE 5820.2A, Radioactive Waste Management, Chapter V, requires that DOE organizations shall develop and document their programs to provide for the surveillance, maintenance, and decommissioning of contaminated facilities. The decommissioning activity shall be implemented as follows: each field organization shall prepare and maintain a completed list of contaminated facilities, both operational and excess, under its jurisdiction; operational records for all contaminated facilities shall be maintained by the cognizant field organization; planning for decommissioning shall be initiated during the design phase for new facilities and prior to termination of operations for operational facilities and such plans shall consider the 2-year budget cycle; and Program offices shall be responsible for placing the facility in a safe storage condition, providing surveillance and maintenance, and decommissioning when facilities become excess.

Section 3.c requires that DOE Program organizations shall identify contaminated facilities under their jurisdiction, document the potential for reuse and recovery of materials and equipment, and develop schedules for decommissioning. Program organizations shall assure that, prior to initiation of decommissioning activities, adequate surveillance and maintenance is performed to meet applicable radiation standards. Decommissioning project activities include characterization, environmental review, and engineering including a Decommissioning Project Plan. The Order also defines requirements for Decommissioning Operations and Post Decommissioning Activities including a project final report.

Finding

Neither SNL, Albuquerque, nor the DOE field organization has developed and implemented programs to provide for the surveillance, maintenance, and decommissioning of contaminated facilities.

Discussion

Neither SNL, Albuquerque, nor the DOE field organization has clearly assigned organizational responsibility for implementing the management, decontamination, and decommissioning of radioactive facilities under DOE ownership or control. SNL, Albuquerque, has initiated some efforts to implement the requirements of DOE 5820.2A, but they do not constitute an organized and planned approach to develop and implement an adequate program (I-R-97 and I-R-113). The DOE field organization has not developed a program that meets the requirements of this Order (I-R-73, I-R-78, I-R-107, and I-R-120). The following specific deficiencies were identified by the Tiger Team:

1. There is no mechanism to compile and maintain a complete list of contaminated facilities, both operational and excess. There is no mechanism to ensure that a continuous record of jurisdictional program responsibility for all contaminated facilities is maintained in a retrievable manner.

2. There is no mechanism to ensure that operational records are maintained in a retrievable manner for all facilities. Required records include design drawings and modifications, characterization data on contamination levels, prior decontamination activities, and incidents.
3. There are no methods for ensuring that facility decommissioning is incorporated during the design phase (see Finding RAD/CF-15 and RAD/CF-12).
4. There are no formal methods for ensuring that planning for decommissioning is initiated prior to termination of operations and that the 2-year budget cycle is considered to ensure adequate funding (I-R-111).
5. There are no procedures that describe the methods for placing the facility in a safe storage condition and to provide for surveillance and maintenance. These requirements are currently implemented by memorandum (R-21 through R-23) and surveillance and maintenance are performed in the same manner as when the facility was operational (I-R-111).
6. There are no procedures to ensure that all stored hazardous materials are removed by the operator as the last part of the operational activities prior to entering the decommissioning phase.
7. There are no procedures that ensure decommissioning activities are carried out in accordance with the requirements of DOE 5820.2A. Such activities include characterization, environmental process review, engineering, decommissioning operations, and post decommissioning activities.
8. There is no Quality Assurance Plan that covers decommissioning activities at SNL, Albuquerque.
9. There is no mechanism to ensure that facilities or material generated by decontamination of these facilities meet the release criteria of DOE 5400.5 (see Finding RAD/CF-4).

This finding was partially addressed in the PTTSA Report and the ES&H Action Plan.

FINDING RAD/CF-14:**Control of Radioactively Contaminated Personal Property****Performance Objective**

DOE 5400.5, Radiation Protection of the Public and the Environment, Chapter II, Section 5, establishes the requirements for the release of potentially contaminated personal property (items other than land or buildings). Potentially contaminated personal property may be released for unrestricted use if the property is within the contamination limits of the Order. Prior to release, the contamination shall be subjected to the as low as reasonably achievable (ALARA) process. Property shall be considered to be potentially contaminated if it has been used or stored in radiation areas that could contain unconfined radioactive material or that is exposed to beams of particles capable of causing activation. Material that has been contaminated in depth such as activated material, may be released if criteria and survey techniques are approved by EH-1.

Finding

Current programs at SNL, Albuquerque, for the control and release of radioactively contaminated personal property are not adequately developed or implemented to ensure compliance with the requirements of DOE 5400.5.

Discussion

Contaminated and potentially contaminated personal property may be created in various areas at SNL, Albuquerque, or at the Nevada Test Site and later transferred to SNL, Albuquerque. There is currently no program in place to track and control all of this property to ensure that it is properly stored and not disposed of as clean waste or released. The site is in the process of developing a radioactive material tracking system which may solve this problem (I-R-72). In addition, there is no program or formal procedures for the survey and release of contaminated and potentially contaminated personal property (I-R-17 and I-R-79). The following specific deficiencies were identified:

1. Existing controls of personal property are not adequate to prevent contaminated materials that exceed the limits of DOE 5400.5 from being released as clean. The Tiger Team identified several examples of contaminated material being sent to the West Reapplication Yard to be handled as clean material (e.g., lead bricks, hot plate, etc.).
2. Potentially contaminated personal property from experiments at the Nevada Test Site is returned to SNL, Albuquerque, for testing and storage. Some of this material may be used for various purposes and some of it may be stored for future use or until it is declared waste. There are no sitewide controls or requirements regarding the use and storage of such material or positive controls for tracking it to ensure it is not disposed of as clean. In addition, there are no clear requirements defining when this material must be declared waste and disposed of in accordance with DOE 5820.2A.
3. All SNL, Albuquerque, activities involving radioactive material or radiation producing devices are sources of potentially contaminated

personal property. This material lacks the same types controls as that described for the personal property received from the Nevada Test Site described in item 2. above.

4. Current methods and procedures for surveying, decontaminating, or releasing material do not ensure that DOE 5400.5 limits are met for materials that has been surface or volume contaminated.

This finding was partially addressed in the PTTSA Report and the ES&H Action Plan.

FINDING RAD/CF-15:**Incorporating Environmental Design Criteria Into New Facilities and Modifications****Performance Objective**

DOE 5400.1, General Environmental Protection Program, Chapter IV, Section 3, requires pre-operational studies for new facilities with the potential for significant environmental impact. This study should begin not less than 1 year and preferably 2 years before startup.

DOE 5400.5, Radiation Protection of the Public and the Environment, Chapter II, Section 2, requires that the as low as reasonably achievable (ALARA) process be considered in facility design.

DOE 5820.2A, Radioactive Waste Management, Chapter III, requires that development of all designs incorporate waste minimization principles. Chapter V requires that planning for facility decommissioning shall be initiated during the design phase for new facilities.

DOE 6430.1A, General Design Criteria, provides specific guidance for incorporating radiological controls; effluent controls and monitoring; decontamination and decommissioning; and ALARA into facility designs. Special DOE facilities, such as those containing radioactive materials, have additional design criteria.

DOE 4700.1, Project Management System, Chapter II, Part F, requires that an environmental, safety, and health plan be prepared as Annex III of the project management plan. Attachment II-4 states that this plan shall define specific actions being taken on the project to comply with existing directives on environment, safety, and health issues.

Finding

The SNL, Albuquerque, Request for Facilities Support (RFS) program is not completely formalized and does not contain all of the necessary elements to ensure that environmental design criteria required by DOE Orders are implemented during all stages of the design process.

Discussion

In the past, the design program failed to address environmental design criteria. There are many examples of these failures (I-R-67, I-R-68, and I-R-69) such as the following: the Radioactive and Mixed Waste Management Facility was designed and constructed without National Environmental Policy Act (NEPA) documentation or a formal Safety Analysis, and modifications to this facility are not being implemented in compliance with the nuclear facility requirements of DOE 5480.5; and the decontamination facility at the Strategic Defense Facility (SDF) does not meet the requirements of DOE 6430.1A for this type of facility; and (3) inadequate NEPA determinations (see Finding N/CF-1).

The RFS program and operations within Directorate 7800 have been improved to eliminate this deficiency and additional improvements are planned (R-15 and R-16). Within this organization, the Tiger Team observed a high-level of awareness of the need to incorporate environmental design criteria into the

design and engineering process; however, the program is deficient in several areas. The Tiger Team identified the following specific deficiencies:

1. The methods for completion of the RFS forms, transmittal to the Project Management Division (7823), review, processing, approval, etc., are not documented in formal procedures. The user is required to determine if the RFS has ES&H significance but is not provided with any documented guidance or training on how to complete the forms. The appropriate Facility Customer Representative from Division 7823 verifies that the form was correctly filled out. In the near future, this will be changed so that Facilities Engineering Department (7840) personnel will complete the forms.
2. The Facilities Safety and Engineering Division (7853) reviews the completed RFS forms and notifies the Environmental Programs Department (3220) when their support is needed. The prerequisites, requirements, and mechanisms for making such notification are not defined in a procedure. In addition, this mechanism does not ensure that Department 3220 identifies all RFS forms that have a potential impact on its areas of responsibility. The Health and Safety Department maintains two full-time people in Division 7853 to ensure all RFS forms are reviewed for Safety and Health concerns.
3. For line item, general plant project (GPP), and larger projects, Department 3220 is made aware of the project through other mechanisms in addition to the RFS form. Department 3220 may be a member of the Project Team and is always included in the design document review cycle. Facilities Engineering Department (7840) procedures (R-19) do not establish any specific conditions for including a member of Department 3220 on the Project Team. It appears to be done on an ad hoc basis.
4. AL 4700.1, requires that all projects greater than \$150,000 have project management plans consistent with the requirements of DOE 4700.1. One of the purposes of this plan is to ensure that environmental criteria are implemented. However, several of the project management plans reviewed (I-R-109) did not contain the environmental, safety, and health plan required by that Order. There is no requirement in the Department 7840 procedures (R-19) to include this plan as a specific element in the project management plan.
5. Once the RFS is accepted by Department 7840, the design criteria are established by Division 7823, Division 7853, and Department 7840. For several plant project and line item projects, the Project Team will be also be involved. For other projects, Department 3220 will only be involved to the extent that they are aware of environmental concerns (see item 2 above). This process does not result in a list that includes all required design criteria. For example, facilities recently designed do not meet the specific requirements of DOE 5820.2A for decontamination and decommissioning.
6. Neither SNL, Albuquerque, nor AL has a formal mechanism to determine, early in the design process, whether or not a facility will be

designated as nuclear. All applicable design criteria cannot be established until this determination has been made.

This finding was not addressed in the PTTSA Report and the ES&H Action Plan.

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3.5.8 Inactive Waste Sites

3.5.8.1 Overview

The inactive waste sites portion of the Tiger Team Assessment evaluated the compliance status of SNL, Albuquerque, with regard to those documents listed in Table 3-10 and best management practices. The scope of the review included interviews with DOE, SNL, Albuquerque, and regulatory personnel; extensive review of documents, plans, sampling results, procedures, and correspondence; and evaluation of the adequacy of the spill reporting process. The inactive waste sites assessment also included an evaluation of Emergency Planning and Community Right-to-Know Activities under the Superfund Amendments and Reauthorization Act (SARA) Title III.

SNL, Albuquerque, has no sites included or proposed for inclusion on the National Priority List, and has one State compliance order that applies to the chemical waste landfill. The compliance order, dated January 1, 1990, requires SNL, Albuquerque, to gather data to determine the effect that the landfill has on groundwater. The required report was submitted during this Assessment.

In December 1983 and April 1984, SNL, Albuquerque, submitted to the EPA and the New Mexico Environmental Division (NMED), respectively, a RCRA Part B Permit Application. In April 1991, SNL, Albuquerque, submitted Revision 5.0 of its application. Upon granting the RCRA Part B Permit, SNL, Albuquerque, expects that EPA and NMED will specify an environmental restoration schedule.

SNL, Albuquerque, has requested an interpretation of DOE 5400.4 from DOE HQ. In particular, clarification is being sought for the phrase contained in paragraph 7(c) "not inconsistent with the NCP." In the meantime, by comparing the requirements of RCRA to the requirements of the NCP (as contained in CERCLA), SNL, Albuquerque, has proposed an interpretation of this phrase to DOE. In a letter to KAO (IWS-1) dated March 13, 1991, SNL, Albuquerque, proposed that if five elements are added to the RCRA corrective actions, then they will be in compliance with DOE 5400.4. The elements are:

- Conduct an acceptable Community Relations Program,
- Maintain an Administrative Record,
- Consider Applicable or Relevant and Appropriate Requirements (ARAR),
- Perform Natural Resource Damage Assessments,
- Support AL and KAO in negotiating a non-NPL Interagency Agreement and/or a Federal Facilities Agreement as appropriate (DOE 5400.4).

In the absence of guidance to the contrary, SNL, Albuquerque, is applying its interpretation in planning environmental restoration projects.

To comply with DOE 5400.4, SNL, Albuquerque's, Environmental Impact and Restoration Division has drafted a four volume Environmental Restoration

TABLE 3-10
LIST OF APPLICABLE INACTIVE WASTE SITES AND RELEASES
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
CERCLA/SARA	Section 103-Notices, Penalties	EPA
CERCLA/SARA	Section 120-Federal Facilities	EPA
29 CFR 1910	Part 1910.120 Occupational Safety and Health Standards	OSHA
40 CFR 300	National Oil and Hazardous Substances	EPA
40 CFR 302	Designation, Reportable DOE-Headquarters quantities, and Notification	EPA
40 CFR 264	RCRA Subpart F, Corrective Action	EPA
40 CFR 355	Emergency Planning and Notification	EPA
40 CFR 370	Hazardous Chemical Reporting: Community Right-to-Know Act	EPA
40 CFR 372	Toxic Chemical Release Reporting	EPA
40 CFR 373	Reporting Hazardous Substance Activity when Selling or Transferring Federal Real Property	EPA
DOE 5400.1	General Environmental Management Program	DOE
DOE 5400.4	CERCLA Requirements	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
DOE 5000.3A	Occurrence Reporting and Processing of Operations Information	EPA
DOE 5500.2A	Emergency Notification, Reporting and Response Levels	DOE
Oswer Directive 9355.3-01	Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA	EPA

Implementation Plan that consists of the following four volumes:

- Project Management Plan,
- Quality Assurance,
- Health and Safety Plan, and
- Community Relations Plan

Historically, four projects have been completed for the purpose of identifying inactive waste sites. The first project was undertaken by AL in 1984; in 1987, the results of this effort were published in a draft document entitled Comprehensive Environmental Assessment and Response Program (CEARP). The CEARP qualitatively identified 117 inactive release and disposal sites. Also during 1987, an EPA contractor evaluated site information and compiled a RCRA Facility Assessment (RFA). The RFA identified 139 solid waste management units (SWMUs) and noted an additional 23 "areas of concern." Under RCRA (3004(u) and 3008(h)), EPA has the authority to require corrective action of SWMUs. The last two studies, one by DOE Headquarters in 1987 and another by SNL, Albuquerque, in 1988, identified additional sites, which brings the current estimate of inactive waste sites located at SNL, Albuquerque, to 150.

In 1989, the Environmental Impact and Restoration Division of SNL, Albuquerque, was formed. This division is responsible for the management and remediation of inactive waste sites. EIRD has grouped the 150 identified sites into 26 operable units.

Each operable unit was prioritized first according to the Hazard Ranking System (HRS) contained in the NCP and then by a modified HRS system based on guidance provided by DOE HQ. Each site was assigned an Activity Data Sheet number for budgetary and administrative control. Any site that scores 28.5 or higher must be included on the National Priorities List. As prioritized by the Environmental Impact and Restoration Division, and reviewed by EPA, none of the sites scored high enough to be included on the National Priorities List; the highest score that a site received was 22 out of a possible 100. The operable units with the highest priority ranking, such as Technical Area II and the Chemical Waste Landfill, are in the early planning stages for environmental restoration.

Site activities with respect to SARA Title III, Sections 304, 311, and 312, have resulted in the timely filing of required reports. At the suggestion of DOE HQ, SNL, Albuquerque, plans to voluntarily comply with Section 313 of SARA. Section 313 reports are to be submitted to AL by June 1 each year so that they can be reviewed and submitted to EPA in time to meet the July 1 filing date.

The Environmental Subteam has identified six findings in the inactive waste site portion of this Tiger Team Assessment:

- Identification of Reportable Quantity Releases
- Property Transfer
- Documentation of Assessment Bases Discrepancies

- Community Relations for the Environmental Restoration Program
- RCRA/CERCLA Regulatory Interface in the Environmental Restoration Program
- Identification and evaluation of Waste Sites

Of these findings, one is compliance based and five are based on best management practices.

3.5.8.2 Compliance Finding

FINDING IWS/CF-1: Identification of Reportable-Quantity Releases

Performance Objective

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations (40 CFR 302) require facilities to immediately report the release of a hazardous substance (except federally permitted releases) in excess of a reportable quantity (RQ) to the National Response Center. Additionally, the Superfund Amendments & Reauthorization Act (SARA, 40 CFR 355), requires facilities to immediately notify the state emergency planning commission and the local emergency planning committee of "any area likely to be affected by a release" that exceeds a reportable quantity of an extremely hazardous substance (40 CFR 355 Appendix H) or CERCLA hazardous substance.

DOE 5500.2A, Emergency Notification, Reporting and Response Levels, requires field elements to notify the Headquarters Emergency Operations Center and the National Response Center as soon as possible, within 24 hours, of a release of a hazardous substance that exceeds a CERCLA reportable quantity.

DOE 5000.3A, Occurrence Reporting and Processing of Operations Information, defines a release that exceeds an RQ as an unusual occurrence. Both SARA and DOE 5000.3A have a requirement to submit written notifications to appropriate individuals when a release exceeds RQ.

Finding

The programs and procedures that SNL, Albuquerque, has in place are insufficient to identify all tests, experiments, and normal occurrences that may release RQs of hazardous or extremely hazardous substances as defined under CERCLA and SARA.

Discussion

The reporting of an RQ release at SNL, Albuquerque, begins when an individual recognizes that an environmental release may have occurred and notifies security or the Environmental Safety and Health Directorate. Line organizations have not received the necessary technical support, formal procedures, or training to identify when normal operating conditions may result in an RQ being released. It should be noted that once a release was recognized, the required notifications were complete and accurate.

SNL, Albuquerque, released a bulletin (IWS-71) in August 1989 describing an EPA interpretation of RQ, and on April 9, 1991, released a revised spill-control procedure (IWS-75). However, these documents do not address situations where normal activities may release an RQ, such as a test at the sled track or melting and pouring of lead at the foundry.

During the Tiger Team Assessment, the Environmental Subteam toured the sled track, foundry, and liquid-metal processing facility to evaluate the programs and procedures in place to ensure that these areas would respond appropriately if and when an RQ was released. Based on discussions with supervisors and technical staff in these areas (I-IWS-27 and I-IWS-28, I-IWS-88 and I-IWS-89, and I-IWS-92 through I-IWS-94), the Environmental Subteam has concluded that

the programs and procedures (IWS-12, IWS-71, and IWS-75) in place are inadequate to identify the potential release of an RQ. The following situations support this concern:

- Since June 1989, there have been nine tests at the sled track using Nike rockets, each of which released an RQ of lead (IWS-30). Only seven of these releases were reported to National Response Center (IWS-80). After revising their pre-test checklist in October 1989 (A-101), Nike rocket tests have been consistently reported.
- There has never been a thorough investigation into the types and quantities of materials released when conducting tests at the sled track. Although there is limited information on the exhaust gases released by six types of rockets (IWS-29), not all rockets used at the sled track have been evaluated. Since April 1990, six tests have been conducted using rockets other than the six referenced above (IWS-30). Some of these rockets may release RQs. Furthermore, materials being impacted have not been evaluated for their potential to release an RQ; in particular, heavy metals and beryllium may be released. These substances have an RQ of 1 pound (e.g., 1 pound of beryllium dust) (I-IWS-27 and I-IWS-28).
- Air emissions from the foundry have never been sampled nor characterized. The 1988 Environmental Survey Preliminary Report (IWS-81) states that lead emissions from the foundry are estimated to be around 100 pounds per year (1988 throughput). Discussions at the foundry (I-IWS-88 through I-IWS-91) indicate that lead was melted less than 24 times per year. Therefore, the foundry potentially emitted more than 1 pound of lead during these melts. Currently, lead is melted and poured less frequently than in the past and the amount used per day has also decreased. Therefore, the potential of exceeding the lead RQ has also decreased but still exists.
- Emissions from the Liquid Metal Process Laboratory, although less likely to release an RQ than the foundry, have never been sampled (I-IWS-92 through I-IWS-94).
- The chemicals listed in the SNL, Albuquerque, Generic Spill Control SOP Appendix C (IWS-75) are EPA's list of extremely hazardous materials. While there is some overlap of this list with the hazardous substances list (40 CFR 302) they are not the same. Consequently, this SOP does not provide adequate guidance for when to report releases to the National Response Center and DOE HQ.
- A memo (IWS-12) was sent from Environmental Impact and Restoration (Division 3223) to line organizations with the potential for air emissions. The memo requested information on the use and potential releases of a number of toxic chemicals. However, some hazardous materials (e.g., lead) were not included on this list. Therefore, personnel in areas such as the foundry may be unaware

that their work potentially releases contaminants above a regulatory standard.

This finding is not identified in either the PTTSA Report or the ES&H Action Plan.

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3.5.8.3. Best Management Practice Findings

FINDING IWS/BMPF-1: Property Transfer

Performance Objective

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires reporting of hazardous substance activity when selling or transferring Federal real property (40 CFR 373). This regulation applies when certain threshold conditions related to quantities of hazardous materials stored or released are reached. If one of those conditions occurs, the sale/transfer contract must include a notice containing information about the materials stored or released.

While the use of land grants does not require compliance with 40 CFR 373, it is a best management practice to know if significant quantities of hazardous materials have been stored or released on a piece of property or in a building.

Finding

The KAO does not have a policy, program, or procedure in place to evaluate real property in accordance with CERCLA requirements to report past or current hazardous substance activities.

Discussion

KAO is seldom involved in what would technically be considered a transfer of Federal real property (transfer of fee simple interests); rather, KAO uses land grant permits to acquire and relinquish control of both land and buildings. The Environmental Subteam reviewed the preamble of 40 CFR 373, published in the Federal Register April 16, 1990 (IWS-76), and spoke with a DOE employee (I-IWS-98), who was on the EPA committee that developed this regulation. From this information it was determined that the use of Federal land grants is exempt from 40 CFR 373. However, using 40 CFR 373 as guidance when acquiring or relinquishing control of real property is a best management practice in that it allows SNL, Albuquerque, and KAO to make informed property management decisions that will protect public health, employee health, and the environment while at the same time reducing the potential liability of SNL, Albuquerque, KAO, and DOE.

Currently, KAO on behalf of SNL, Albuquerque, manages approximately 150 active land grant permits (IWS-79). Most of these are with the Kirtland Air Force Base (KAFB), but some are with the United States Forest Service. The majority of these permits are "ingrants," that is, they give SNL, Albuquerque, the right to use the property, as opposed to "outgrants," which allows another agency to use property that SNL, Albuquerque, is responsible for.

On the average, it appears that annually five or six permits are either not extended or are inactivated (IWS-79) and two or three new permits are requested (IWS-79) (I-IWS-25 and I-IWS-85 through I-IWS-87). Currently, when land is ingranted or outgranted there is no policy, program, or procedure to evaluate this transaction in accordance with 40 CFR 373. In addition to reviewing what hazardous substances were stored or released on property that

SNL, Albuquerque, is relinquishing, it is also a good management practice for them to request the same information when acquiring property.

Historically, KAFB has granted SNL, Albuquerque, 5-year ingrant permits (ingrant for SNL, Albuquerque, outgrant for KAFB), and at the end of 5 years if the land/building was still needed the permit would be extended. Currently, KAFB is revising this procedure and now grants permits for 1 year (I-IWS-14). Therefore, it is most important to use 40 CFR 373 as guidance when property is being transferred between agencies and less critical when a permit is being extended year-to-year. However, it is a good management practice to periodically update site-specific information so that when SNL, Albuquerque, relinquishes control of a site that they managed for 30 or more years, the information required (per 40 CFR 373) will be available.

FINDING IWS/BMPF-2:**Documentation of Assessment Discrepancies****Performance Objective**

When statements in regulatory agency documents are contradictory to positions taken by DOE or SNL, Albuquerque, it is a best management practice to have a written record acknowledging the differences and explaining the rationale for the position/decision of DOE or SNL, Albuquerque. This is particularly true when documents may be subject to public scrutiny. In those instances, contradictions should be addressed and explained before they enter the public domain.

Finding

Neither AL nor SNL, Albuquerque, have formally explained nor documented contradictory assessments that exist between the Comprehensive Environmental Assessment and Response Program Report (CEARP, IWS-43) and the RCRA Facility Assessment (IWS-44).

Discussion

In the CEARP (IWS-43), completed by AL in 1987, public health and environmental risks were evaluated and environmental restoration sites were prioritized utilizing a Hazard Ranking System (HRS) developed by the EPA (40 CFR 300). In doing this evaluation, AL determined that the potential for human exposure via airborne vectors was insignificant. EPA Region VI reviewed the information that DOE provided and concurred with the conclusions of the CEARP Report.

Also in 1987, as part of EPA's review of the SNL, Albuquerque, application for a RCRA Part B Permit, EPA conducted an assessment of solid waste management units (SWMUs) at SNL, Albuquerque. In this assessment (IWS-44), EPA identified a number of SWMUs as having a high or moderate potential to release airborne contaminants. Examples of sites identified as having a high potential to release airborne contaminants include:

- Coyote Test Site (SWMUs #136-139);
- Lead Firing Site (SWMU #132);
- Sol Se Mete Canyon (SWMUs #50 and 51);
- Building Debris Dump (SWMU #55);
- Storm Drain System (SWMU #113);
- Thermal Treatment Facility (SWMU #102); and
- Shock Tube Debris Area (SWMU #56).

While SNL, Albuquerque, and AL are in agreement with those at EPA Region VI responsible for enforcing CERCLA, there exists in the public record a disagreement between the CEARP and the RCRA Facility Assessment. It would be a best management practice for SNL, Albuquerque, and DOE, to meet with EPA to address these differences, resolve them, and formally document the discussions

and resolution. If the issues cannot be resolved, then a good management practice would be for either SNL, Albuquerque, or DOE to formally (i.e., in the public record) acknowledge the differences and explain the rationale for the position/decision of DOE or SNL, Albuquerque.

This finding was not identified in the PTTSA Report or ES&H Action Plan.

FINDING IWS/BMPF-3:**Community Relations for the Environmental Restoration Program****Performance Objective**

DOE 5400.4, Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Requirements, states that for Federal facilities that are not listed on the National Priorities List (NPL), environmental restoration activities shall be conducted in a manner "not inconsistent with" the CERCLA National Contingency Plan (NCP). SNL, Albuquerque, has submitted to KAO a proposed interpretation of the applicability of DOE 5400.4 to site environmental restoration activities, which states that compliance with the Order requires implementation of a community relations program that meets the requirements of the Resource Conservation and Recovery Act (RCRA), National Environmental Policy Act (NEPA), and CERCLA (IWS-82).

CERCLA 40 CFR 300.430(c) requires that a formal Community Relations Plan (CRP) be established before beginning an approved remediation program. Although regulatory approval for beginning environmental restoration of inactive waste sites has not yet been received (SNL, Albuquerque, KAO, and AL have applied for and anticipate receiving a RCRA Part B Permit, under which they will remediate inactive waste sites), it is a good management practice to anticipate those requirements and to prepare a CRP that addresses the activities that will take place as part of the Environmental Restoration Program.

Finding

SNL, Albuquerque, KAO, and AL have not implemented a formal, integrated Community Relations Program that addresses the activities that occur as part of the Environmental Restoration Program (I-IWS-37, I-IWS-38, and I-IWS-65 through I-IWS-67).

Discussion

The issues involved in the Environmental Restoration Program at SNL, Albuquerque, such as the operable laws, rules, regulations, and DOE Orders, the administrative responsibilities shared or delegated between AL, KAO, and SNL, Albuquerque, and the selection of technologies for remediation of specific inactive waste sites, are very complex. SNL, Albuquerque, KAO, and AL are aware that a formal CRP may be required under the Part B permit before remedial actions can begin, and SNL, Albuquerque, has begun planning this program. Although the New Mexico Environmental Division will be charged with conducting public meetings and ensuring that an appropriate CRP is developed, the preparation and presentation of reports, and news releases, as well as the assignment of appropriate persons to participate in the community relations program on behalf of DOE, will be the responsibility of SNL, Albuquerque, KAO, and AL.

Public information hearings on the "Five-year Plan for Environmental Regulatory and Waste Management for SNL, Albuquerque," that were held in September 1990, as well as public hearings on the Kirtland Air Force Base RCRA permit, have indicated the community's concern for environmental restoration programs in the Albuquerque area.

A best management practice would include the anticipation of, and planning for, the preparation of formal documentation outlining the duties and responsibilities of each organization and the designation of individuals or offices to whom the community should address concerns. At the time of the Tiger Team Assessment, a CRP was being prepared by SNL, Albuquerque, as a part of the Project Management Plan. While the draft document presented general guidance, it did not include a discussion of each organization's responsibilities, the channels for submittal and review of documents and presentations destined for public presentation, and the assignment of responsibility for responding to issues of concern raised by the community. The draft CRP reviewed by the Tiger Team was being prepared by SNL, Albuquerque.

Because of the potential magnitude of the ERP and the importance of community relations and public acceptance to the success of the ERP, a best management practice would be to develop integrated policies and procedures for a CRP encompassing SNL, Albuquerque, KAO, and AL in a manner that ensures that the community is fully informed in a timely manner of actions proposed for the ERP, and that ample opportunity is provided for commenting on the proposed actions.

SNL, Albuquerque, in its PTTSA Report (IWS-52) and ES&H Action Plan (IWS-54) recognized this deficiency. AL, in its Self-Assessment Report (IWS-53), recognized that interfaces (for AL and area offices) are not well defined in the Environmental Safety and Health (ES&H) and environmental restoration/waste management organizations.

FINDING IWS/BMPF-4:**RCRA/CERCLA Regulatory Interface in
Environmental Restoration Program****Performance Objective**

Because of the large number of inactive waste sites and the many different contaminants involved at SNL, Albuquerque, as well as the complex interactions between environmental regulations and DOE Orders, it would be a good management practice for the Environmental Restoration Program to establish documentation clarifying the relationship between the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA) and DOE 5400.4, CERCLA requirements.

The principal objective would be to clarify how SNL, Albuquerque, will assure compliance with DOE 5400.4, which states that it is the policy of DOE to respond to releases of hazardous substances in accordance with the provisions of CERCLA, as amended, as well as those of the National Contingency Plan (NCP) and Executive Order 12580. The Order also states that in instances where corrective actions are carried out under other regulations, such as Section 3004(u) or 3008(h) of RCRA, DOE needs to ensure that these corrective actions are not inconsistent with the NCP and that they also satisfy CERCLA requirements for response actions. Lastly, DOE 5400.4 states that DOE will enter into Interagency Agreements and/or Federal Facility Agreements as appropriate, with Federal, State, and local entities for the execution of remedial investigations/feasibility studies.

Finding

The SNL, Albuquerque, Environmental Restoration Program has not issued formal documentation to be used as a basis for planning a corrective action program that will ensure compliance with the rules and regulations of CERCLA, RCRA, and DOE Orders.

Discussion

Because of the large number of inactive waste sites, and the myriad of contaminants present at SNL, Albuquerque, it is important to document the methodology to be used to ensure compliance with DOE 5400.4 which requires that responses under RCRA corrective action not be inconsistent with the NCP.

SNL, Albuquerque, currently operates under RCRA interim status and has filed a Part B Permit application in response to directions from EPA Region VI and the State of New Mexico. Until the proposed Subpart S (Corrective Action Rule for Solid Waste Management Units) of 40 CFR 264 appearing in 55 Federal Register 30798 (July 27, 1990) is finalized, the site is operating under the premise that regulatory agencies will make case-by-case decisions on appropriate corrective actions for inactive waste sites through incorporation of conditions in SNL, Albuquerque's, RCRA permit upon or subsequent to its issuance. The background for this position is based upon (1) the final RCRA Facility Assessment Report of Solid Waste Management Units at Sandia National Laboratories, Albuquerque (IWS-44), published by EPA in August 1987, (2) the Comprehensive Environmental Assessment and Response Program (CEARP) - Phase I for Sandia National Laboratories, Albuquerque (IWS-43), as prepared by AL in September 1987, and (3) the EPA ranked the identified inactive waste sites using their Hazards Ranking System, and concluded that none of SNL,

Albuquerque's, inactive waste sites meet the criteria for listing on the National Priority List.

Although the SNL, Albuquerque, program is proceeding towards obtaining a RCRA Part B permit and planning the subsequent corrective actions to be performed in accordance with the anticipated limits of the permit, there are inactive waste sites that may come under CERCLA regulations, especially where radioactivity is the contaminant of concern. Consequently, documentation is needed to ensure that environmental restoration actions are performed in compliance with the rules and regulations of CERCLA, RCRA, and DOE Orders. SNL, Albuquerque, in an April 1991 revision of its draft Environmental Restoration Program Implementation Plan" (IWS-46) appears to have addressed this deficiency, but the document had not been reviewed and approved by KAO and AL.

SNL, Albuquerque, in its PTSA Report (IWS-52) and ES&H Action Plan (IWS-54) recognized this deficiency and proposed corrective actions.

AL in its Self-Assessment report (IWS-53) recognized that interfaces are not well defined in the Environmental Safety and Health and environmental restoration/waste management organizations.

FINDING IWS/BMPF-5:**Identification and Evaluation of Waste Sites****Performance Objective**

DOE 5400.4, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Requirements, states that it is the policy of DOE to respond to releases of hazardous substances in accordance with the provisions of CERCLA, as amended, as well as those of the National Contingency Plan (NCP) and Executive Order 12580. DOE responses shall include both removal and/or remedial action, as appropriate, to reduce adverse impacts on public health and the environment regardless of whether the facility is listed on the National Priorities List (NPL). The Order also states that in instances where corrective actions are carried out under other authorities such as Section 3004(u) or 3008(h) of the Resource Conservation and Recovery Act (RCRA) or State laws, DOE must ensure that these corrective actions are not inconsistent with the NCP and that they satisfy CERCLA requirements for response actions. The NCP (40 CFR 300, as finalized on March 8, 1990 in FR 8666) requires that DOE perform Preliminary Assessments (PAs) for all release sites to set priorities for site inspections (SIs) and gather existing data to facilitate later evaluation of the release pursuant to the Hazard Ranking System (HRS), if warranted.

DOE 5480.19, Conduct Of Operations, Chapter I, states that effective implementation and control of operating activities are primarily achieved by establishing written standards, periodically monitoring and assessing performance, and holding personnel accountable. The standards should define operating objectives, establish expected performance levels, and clearly define responsibilities. Procedures or other definitive documentation should specify policies that are to be applied and should also provide for the types of controls necessary to implement policies.

Finding

The SNL, Albuquerque, program for continuing identification and evaluation of waste sites for inclusion into the Environmental Restoration Program is not fully developed and implemented.

Discussion

SNL, Albuquerque, has already completed several actions to identify and preliminarily evaluate the large-scale waste sites. Three calls for information on waste sites have been made in various SNL, Albuquerque, publications as follows: 1) a call for general waste site information in the weekly laboratory bulletin, 2) a call for information on the Technical Area III Chemical Waste Landfill in the weekly laboratory bulletin, and 3) a call for information on the low-level waste landfill in Technical Area II. New sites will be identified through employee/retiree information requests, unplanned site identification, proposed actions reviewed by the SNL, Albuquerque, NEPA program, and comprehensive scoping of operable unit assessment efforts. The mechanisms for implementing these continuing methods of site identification and performing initial evaluations are not well developed or implemented through formal procedures.

Division 3223 has not implemented a well-defined process, including procedures, for evaluating new potential waste sites, documenting the

evaluation, and including them in the Environmental Restoration Program. The draft Environmental Restoration Program Implementation Plan, Volume 1, Project Management Plan, provides guidance on evaluating a new site; however, the document has not yet been implemented. This document also provides a form for notifying Division 3223 but no instructions or mechanisms for its use are described.

Continuing identification of new sites by employees/retirees is critical to the success of the Environmental Restoration Program. However, there is no formal, well-defined process to accomplish such notifications. The Tiger Team identified the following deficiencies in this process:

1. The process for employees/retirees to report this type of information to the Environmental Impact and Restoration Division (3223) is not well defined and not all employees not aware of the methods for making such a notification. Annually an Environmental Safety & Health Bulletin is issued that defines that mechanism for reporting Health and Safety concerns and all employees receive training on the content of the bulletin. Although the mechanism described in this bulletin could be used to report environmental problems, it is almost completely geared to OSHA-type Safety and Health concerns and makes no mention of environmental concerns. The Tiger Team identified that employees were aware of environmental problems in Building 863 for a few years and were unaware of all available mechanisms to notify the Environmental Programs Department (3220). Consequently, these problems went unreported to Department 3220.
2. The ES&H Manual (R-20), Section 2L, establishes a mechanism for reporting ES&H concerns. Although it could be used to report environmental concerns, it is primarily geared to Safety and Health concerns and makes no mention of environmental concerns. This section of the Manual states "SNL encourages all personnel to identify unsafe and unhealthy conditions through the established system. . . ."
3. There appears to be a strong mechanism for reporting health concerns involving waste or potentially hazardous material. The Industrial Hygiene Division (3211) has an established system for evaluating and documenting such concerns. However, this system does not include any notification or review by Department 3220 when a potential waste site is involved. In fact, Division 3211 has been aware of the problems in Building 863 since November 1988, but never notified Department 3220 of any potential waste site problems.

3.5.9 National Environmental Policy Act

3.5.9.1 Overview

The purpose of the National Environmental Policy Act (NEPA) portion of the Tiger Team Assessment at the SNL, Albuquerque, was to (1) evaluate the NEPA management structure and NEPA review processes at SNL, Albuquerque, and, as related to SNL, Albuquerque, KAO and AL (2) identify inappropriate procedures or inadequate NEPA documentation; and (3) evaluate compliance with the NEPA, Council on Environmental Quality (CEQ) regulations, and DOE NEPA guidelines, Orders, and memoranda. Table 3-11 lists applicable regulations and/or requirements used to evaluate NEPA compliance.

The general approach to the NEPA assessment included interviews, document review, and onsite verification. Interviews were conducted with staff responsible for NEPA compliance, training, public relations, legal matters, facilities, program management, and project leadership. Documents were reviewed for adequacy in relation to (1) compliance with environmental laws, regulations, and guidelines, and (2) use for reference or tiering. Onsite verification of SNL, Albuquerque activities was used to determine whether projects (e.g., building construction, experiments) had been carried out without NEPA review and the activities (and associated impacts) are similar to those described in the NEPA documents.

Oversight responsibility for the site NEPA program is with AL. Documentation related to NEPA for the site consists of a 1977 sitewide Environmental Assessment (EA), a 1988 EA on the Strategic Defenses Facility, a 1991 EA on the Integrated Material Research Laboratory, approximately 144 Action Description Memoranda (ADMs) since 1985, 46 categorical exclusions (CX), and 48 memoranda-to-file (MTF).

KAO, the contracting office for SNL, was established in January 1991. KAO acts as the central point for all NEPA documentation of DOE activities managed under SNL contract, and has the responsibility of channeling NEPA-related materials to AL for review and processing. Currently, all recommendations for NEPA determinations are required to be transmitted by KAO to AL for signature (for actions funded by the Offices of Defense Programs, Energy Research, and Conservation and Renewable Energy) or from KAO to AL to DOE HQ for signature (by all other Program Secretarial Officers). Neither KAO nor SNL can be delegated the authority to make NEPA determinations.

The NEPA portion of the Tiger Team Assessment resulted in five compliance findings dealing with (1) NEPA review procedures and decisionmaking at SNL, Albuquerque, (2) the sitewide EA, (3) appropriate NEPA reviews, (4) tracking and recordkeeping for NEPA and project documentation, and (5) authority for NEPA determinations. In addition, the assessment identified one best management practice dealing with KAO NEPA reviews. All of the compliance findings were addressed to some degree in the self-assessments. The best management practice was not identified in any of the self-assessments.

Prior to 1985, SNL, Albuquerque, had little or no NEPA program, had no full-time NEPA staff until late 1989, apparently little oversight from AL, and gave low priority to NEPA compliance relative to other environmental regulations and requirements. Since 1986, and particularly after the Secretary of Energy announced his 10-point initiative on June 27, 1989,

TABLE 3-11
LIST OF APPLICABLE NATIONAL ENVIRONMENTAL POLICY ACT
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Section/Title	Authority
P.L. 91-190 (January 1, 1970)	National Environmental Policy Act (NEPA)	U.S. Congress
40 CFR 1500-1508 (November 28, 1978)	Regulations for Implementing the Procedural Requirements of NEPA	Council on Env. Quality (CEQ)
10 CFR 1021	Compliance with the National Environmental Policy Act	DOE
10 CFR 1022	Compliance with Floodplain/Wetlands Environmental Review Requirements	DOE
52 FR 47662-47670 (December 15, 1987)	Department of Energy Compliance with the National Environmental Policy Act (NEPA)	DOE
55 FR 37174-37179 (September 7, 1990)	Amendments to the DOE NEPA Guidelines	DOE
Secretary of Energy Notice, SEN-15-90, February 5, 1990	NEPA	DOE
DOE 4700.1	Project Management System	DOE
DOE 5440.1C/1D	NEPA	DOE
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Requirements (CERCLA RI/FS and NEPA)	DOE
N/A	DOE NEPA Compliance Guide (draft 1988)	DOE
N/A	Interim Procedural Guidance for Implementation of SEN-15-90 (March 2, 1990; September 20, 1990)	DOE
N/A	NEPA Guidance related to Memorandum- to-file and Categorical Exclusion (March 25, 1988)	DOE
N/A	Guidance Related to Analysis of Impacts to Workers in NEPA Documentation (June 10, 1988)	DOE

an increased emphasis on NEPA reviews has taken place at SNL, Albuquerque. For example, the number of NEPA and NEPA-related documents submitted to DOE by SNL jumped from 19 in 1988 to 91 in 1991. In 1985 only six NEPA documents were submitted to DOE.

EAs and Environmental Impact Statements (EISs) are the usual mechanisms for informing and soliciting public input for proposed DOE actions which may have a significant effect on the human environment. Judging from the fact that no EISs and only three EAs have been issued for SNL projects at its Albuquerque site, it could be argued that no effort has been made to involve the public in the NEPA process and, until recently, environmental values have not entered into the decisionmaking process at SNL, Albuquerque. The decision to build certain facilities was made or the actual construction had begun before the associated EAs were approved and the FONSI¹s were issued or after detailed design had begun. Although placed in the National Atomic Museum and announced in two local newspapers, the Integrated Materials Research Laboratory EA and FONSI were not distributed to any local, State¹ or Federal agencies after approval by EH-1. Although this notice does meet the minimum requirements, the intention of SEN-15-90 is to encourage greater public participation and disclosure.

A number of facilities have been constructed at SNL, Albuquerque, with no or inappropriate NEPA reviews. Particle Beam Fusion Accelerator (PBFA) I, Neutron Measurements Laboratory (Building 984), and the Radioactive and Mixed Waste Management Facility (Building 6920), have all been constructed without a NEPA review. (see Finding NEPA/CF-3 for other examples). Two major projects, the Saturn Accelerator (built in 1988 to replace the PBFA I) and HERMES III (completed in 1988), were inappropriately determined to be CXs (i.e., actions that do not individually or cumulatively have significant environmental effects).

SNL, Albuquerque, is developing NEPA policy and procedures in an era of changing DOE NEPA requirements, (i.e., SEN-15-90 and subsequent interim procedural guidance), newly issued DOE 5440.1D, and the proposed, but not yet finalized, revisions to 10 CFR 1021 that were published in 55 FR 46444. All these changes have occurred in little more than a year, and all have brought about significant changes in the way that DOE conducts NEPA reviews. The Tiger Team Assessment of NEPA compliance at SNL, Albuquerque, was cognizant of the difficulties associated with developing and implementing NEPA procedures during the post-SEN-15-90 period, and attempted to judge the adequacy of guidance and NEPA determinations only against the regulations, Orders, and guidance that were in effect at the time.

The general impression of NEPA compliance at SNL, Albuquerque, is of a NEPA staff at SNL, KAO, and AL that has a good understanding of the present requirements for compliance within DOE, and all of which are working hard to develop procedures that will ensure complete and timely compliance. Non-ES&H staff, on the other hand, appear to have little or no understanding of the basic requirement of NEPA to consider environmental impacts early in project planning or design. Many of the NEPA findings resulted from the fact that

¹Prior to approval by EH-1, the EA was reviewed by the State of New Mexico during the pre-approval review process. However, the approved EA and FONSI issued by DOE HQ were not sent to the State.

until recently there has been little support for NEPA implementation. SNL, Albuquerque, line management is now responsible and accountable for ensuring that SNL ES&H policies and requirements (including the NEPA Program) are followed within all the various line organizations, and that all personnel are aware of, understand, and comply with ES&H requirements (N-8). This will require attention to NEPA requirements on the part of all levels of management (i.e., Directorate Heads, Department Managers, and Division Supervisors). To that end, the ES&H Training Division (3524) is in the process of developing a three-tiered NEPA program including a NEPA awareness class for most SNL, Albuquerque, staff, a 1-day course for project managers, and a 3-day course for persons involved in the preparation of NEPA-related documentation (I-N-41).

The intention to instill NEPA awareness into the extensive, wide-ranging activities of line organizations will require that the NEPA program be given high priority and that NEPA compliance staff have high visibility in the organizational structure, something that is now lacking. However, the currently proposed reorganization of the ES&H Directorate (N-38) which places the NEPA staff in the Risk Management Division within the Safety Engineering Department (that includes Fire Protection), may not provide the visibility needed to ensure early NEPA review of all SNL, Albuquerque, activities across all line organizations. The SNL's intentions to staff NEPA compliance activities throughout SNL, Albuquerque, and to assure adequate training of ES&H and line organization staff in the requirements of DOE NEPA implementation may require added resources.

3.5.9.2

Compliance Findings

FINDING NEPA/CF-1:

NEPA Review Procedures and Decision Making at SNL

Performance Objective

DOE 5440.1C (6.c.(1)), and DOE 5440.1D (7.a.(2), 7.b.(8)) call for the establishment of procedures to ensure full and consistent compliance with NEPA. These procedures should be approved by Operations Office Managers and Secretarial Officers in consultation with the Assistant Secretary for Environment, Safety and Health (EH-1) in order to ensure consistency in the agency-wide application of NEPA.

The Council on Environmental Quality (CEQ) regulations (40 CFR 1501.2); Secretary of Energy Notice 15 (SEN-15-90); Section A.1 of the DOE NEPA guidelines (52 CFR 47662); and DOE 5440.1C(b)(c)(1) and 5440.1D(6) and (7)(a)(1) require that DOE integrate the NEPA process with project planning at the earliest possible time (1) to ensure that planning and decisions reflect environmental values, and (2) to avoid delays later in the process. DOE 4700.1, Attachment II - Part F(3), calls for appropriate NEPA documentation to be completed prior to initiation of detailed design.

Finding

SNL, Albuquerque, does not have adequate, written procedures for ensuring NEPA review of all activities (I-N-1 through IN-3) (N-45). As a result, NEPA documentation for some SNL, Albuquerque, actions was not completed prior to the final decision on the project or start of construction, as required by CEQ regulations and DOE Orders.

Discussion

No formalized system is in place to cause and control NEPA review of all SNL, Albuquerque, activities. As a result, line management and project proponents may be unaware of NEPA review requirements, and activities can proceed without NEPA determinations. Recent guidance on NEPA implementation has been provided to SNL, Albuquerque, by AL (N-6, N-7, N-14, and N-15), but SNL's NEPA Compliance Guide (N-45) is outdated. While some elements of the SNL NEPA Compliance Guide are still useful, it does not contain the most recent DOE (DOE 5440.1D), DOE NEPA Guidelines (52 FR 47662), or Notices (SEN-15-90) related to NEPA implementation. As a result, use of the SNL NEPA Compliance Guide by staff unfamiliar with recent changes in DOE's implementation of NEPA could lead to non-compliance.

SNL, Albuquerque, has placed responsibility for NEPA compliance on the line organizations. SNL, Albuquerque, supports the line organizations by providing limited NEPA training (N-46) and NEPA-related information (N-8 and N-12). The AL Project Authorization process will trigger NEPA review of Line Items and General Plant Projects (N-47), but SNL does not have an effective mechanism to internally tie project funding to NEPA compliance.

As a result of inadequate NEPA procedures, construction of the Radioactive and Mixed Waste Management Facility (Building 6920) and the Neutron Measurements Laboratory (Building 984) was completed prior to NEPA review (I-N-1 and I-N-

47). NEPA reviews were initiated only after the detailed design phase of the Integrated Materials Research Laboratory (IMRL) (N-39) and after partial construction of the Strategic Defense Facility (I-N-48). Other examples of SNL, Albuquerque, projects approved or initiated before completion of the NEPA review process include (1) Mine Detection by Energetic Photons (MIDEP) project (hardware development is underway; N-44), (2) a solar detoxification experiment (1988; N-29), (3) the SABRE accelerator (I-N-47), and (4) nine or more General Plant Projects such as the paving of the road to Building 6920; Building 9930 Expansion Project; and the Area III/V Fiber Optic Trunk Upgrade (N-21). This finding is based on an analysis of SNL, Albuquerque, memoranda and guidance, NEPA documentation at the site, project lists (N-21, N-22, N-29, N-34, N-35, N-39, and N-44), and interviews of SNL, Albuquerque, staff (I-N-1, I-N-2, I-N-7, I-N-23 through I-N-25, I-N-35, I-N-44, I-N-47, and I-N-48).

SNL, Albuquerque, has recognized that the consistent application of the NEPA process to SNL, Albuquerque, activities is poor, and is attempting to correct that problem by issuance of an ES&H Policy Statement (N-8), publication of a NEPA program in the ES&H Program Environmental Protection and Waste Management Manual (N-28), and formation of a NEPA Implementation Committee (aka NEPA Procedures Development Team) to develop written procedures needed to implement the NEPA Program (N-10). SNL, Albuquerque, Division 3223 is distributing draft implementation guidance titled "Sandia National Laboratories Implementation Guidance - Instructions for Compliance with the National Environmental Policy Act (NEPA) Program (PG470110)" (N-16). The failure of SNL, Albuquerque, to incorporate NEPA into decision making at the earliest phase of the project planning process, as well as lack of oversight by AL at SNL, was also recognized in the SNL, Albuquerque, Self-Assessment Report as well as the AL Self-Assessment Report, April 1991.

The causal factors contributing to this finding are lack of policy implementation and oversight. Under DOE 5440.1D, DOE-HQ, AL, KAO, and SNL, Albuquerque, all share responsibility for ensuring that adequate procedures are developed and implemented to ensure early NEPA reviews of all DOE activities.

Performance Objective

The Council on Environmental Quality (CEQ) regulations at 40 CFR 1502.20 and 1508.28 encourage agencies to tier their Environmental Impact Statements (EISs) to eliminate repetitive discussions in order to focus the environmental analyses on the specific issues of a proposed action. If an agency makes substantial changes in its actions that are relevant to environmental concerns, or there are new circumstances or information pertinent to the agency's actions, CEQ regulations [40 CFR 1502.9(c)] direct the preparation of supplements to existing EISs. Section C.2(a) of the DOE NEPA Guidelines (52 FR 47662) requires an analysis to provide sufficient information to support a DOE determination to prepare an EIS supplement with respect to the CEQ regulations. Additionally, CEQ's "Forty Questions" (46 FR 18036) suggest that an EIS more than 5 years old, which addresses an ongoing program, should be carefully examined to determine the need for a supplement. These citations are applicable to Environmental Assessments (EAs) since an EA provides input in the decision on whether to prepare an EIS (40 CFR 1501.4(c)).

Finding

SNL, Albuquerque, sitewide NEPA document (EIA/MA 77-1) does not adequately assess the individual and cumulative effects of many activities at the SNL, Albuquerque site. Consequently, for certain activities, the sitewide EA is not suitable as a basis for tiering.

Discussion

The Environmental Impact Assessment (EA) for Sandia Laboratories was prepared by the DOE's predecessor organization in 1977. This sitewide EA (N-2) was reviewed for its adequacy from which to tier (or incorporate by reference) subsequent analyses, the significance of several new and proposed facilities and programs, and the need for a supplemental document.

Many of the SNL, Albuquerque activities were judged by AL to need no further NEPA documentation beyond Memoranda-to-File (MTF) based on the conclusion that the described action was "substantially the same" as what was presented in the sitewide EA, or that the impacts were "determined to be insignificant" (N-37). However, in most cases, relevant sections from the EA were not cited nor were quantitative (or qualitative) comparisons provided to support these conclusions. Additionally, the EA would be considered deficient in light of today's environmental regulations and standards, and evolving methods of analysis. Therefore, tiering from this document, prior to SEN-15-90, to support NEPA determinations of insignificance was inappropriate in accordance with DOE NEPA guidance (March 25, 1988) related to categorical exclusions. For example, the Action Description Memorandum for the W33/M422 Stockpile Integrated Laboratory Test (N-30) indicated a series of past and future tests of projectiles containing depleted uranium, beryllium, and tritium. The sitewide EA made reference only to tritium in controlled conditions and the rare use of the other two materials in explosive testing. Thus, impacts and risks associated with these materials under other conditions were not adequately assessed in the sitewide EA. Other examples of the inappropriate tiering from the sitewide EA to support an MTF categorical exclusion include

the STAR Facility (N-31), the SATURN Accelerator (N-32), and the Weapons Production Laboratory (N-33).

The CEQ regulations (40 CFR 1508.7) define cumulative impacts as those incremental impacts to the environment from other past, present, and reasonably foreseeable actions. Cumulative impacts could occur from individually minor but collectively significant actions over time. The sitewide EA fails to assess the cumulative impact to the environment from the collective ongoing operations of SNL, Albuquerque, many of which have commenced since its 1977 publication. As a result, the incremental impacts from actions occurring over the past decade (or a possible reduction in impacts from system upgrades or remedial actions) have not been quantified.

The environmental and regulatory arena has experienced many changes since the sitewide EA was prepared. These changes have influenced the types of impacts that should be analyzed in NEPA documents; for example, wetlands and floodplains (Executive Orders 11988 and 11990); compliance with pollution control standards (Executive Order 12088); and impacts to workers (DOE Guidance June 10, 1988). In addition, the areas of risk and safety assessments have evolved considerably resulting in more credible analyses. The EA did analyze a number of accident scenarios; however, there was insufficient analysis on the risk involved. The EA assumed that regulations and safety standards were in place that would essentially eliminate accidents from occurring. Analysis was limited on hazardous and non-hazardous emissions from the construction and operation of facilities, and there was no discussion of impacts to groundwater, with no overall comparison to applicable standards. The CEQ criteria for determining the need for a supplemental document, in addition to the numerous deficiencies discussed above, indicate the need for a supplement to the existing sitewide EA or a sitewide EIS to ensure correct application of NEPA procedures in the decisionmaking process.

The PTTSA Report recognized that the sitewide EA was outdated (SF-NE-06), and the need to develop a plan and schedule in conjunction with DOE to prepare the necessary updates. The AL self-assessment also noted the need to update the sitewide EA.

DOE-HQ, AL, and KAO all share responsibility for the lack of a useable sitewide document. Lack of policy implementation and training appear to be the causes for not ensuring that an adequate sitewide NEPA document was available.

FINDING NEPA/CF-3:

Appropriate NEPA Review

Performance Objective

CEQ regulations (40 CFR 1500.2, 1505.1) and DOE NEPA guidelines (52 FR 47662, Section A.1, B.1) and amendments (54 FR 12474 and 55 FR 37174) require that the environmental impacts of proposed actions, by or on behalf of DOE, be properly evaluated via the NEPA review process. CEQ regulations (40 CFR 1502.15, 1502.16, and 1508.13) further require that submitted documentation provide enough information for an appropriate NEPA determination based on the context and intensity (significance) of impacts. SEN-15-90 and DOE 5440.1D further require that NEPA review of proposed actions occur early in the process.

Finding

NEPA determinations are lacking for projects and activities initiated at SNL, Albuquerque between 1978 and 1985. Several projects initiated since 1985 lack NEPA determinations or represent inappropriate levels of review (e.g., categorized exclusion or memoranda-to-file used instead of an Environmental Assessment (EA) or Environmental Impact Statement (EIS)) of the impacts. Lack of documentation has resulted in projects proceeding without being subjected to NEPA review, while inappropriate determinations allowed projects to proceed without potential impacts being adequately addressed as required by CEQ regulations and DOE NEPA Guidelines.

Discussion

A lack of NEPA determinations and reviews for SNL, Albuquerque, projects was identified based on discussions with SNL, Albuquerque, and KAO staff (e.g., I-N-14, I-N-24, I-N-25, I-N-29, I-N-34, I-N-35 through I-N-37, and I-N-47), identification of recent projects during the Tiger Team site tour, and examination of the SNL, Albuquerque, project tracking system (N-37) and other documents (e.g., N-22). Examination of the Action Description Memoranda (ADM) and other NEPA-related documentation covering the period from 1985 through 1991 (N-37) showed a number of inappropriate NEPA determinations during the period from 1985 until early 1990 when SEN-15-90 was issued. There is no documentation of projects or NEPA review from 1978 to 1985.

A number of completed projects were identified during examination of the SNL, Albuquerque project tracking system (N-37) as having had no NEPA review. Examples of projects with no NEPA documentation are the 5,000-foot sled track extension completed in 1985, the 300-foot vertical drop water test facility and pool (I-N-34), Advanced Bomb Family Project (I-N-23), a number of solar experiments and facilities (N-29, I-N-25, I-N-36, and I-N-37), minor (less than \$150K) General Plant Projects prior to mid-1989 (I-N-52), Reactor Support Facility, Simulation Testing Laboratory, Particle Beam Fusion Accelerator, Radioactive and Mixed Waste Management Facility, Repetitive Pulse Power Laboratory (I-N-37, I-N-34, and I-N-47), and the Neutron Measurements Laboratory (an EA is being prepared for the operation of this facility).

The NEPA Subteam has concluded that inappropriate NEPA determinations were made for certain projects. For example; AL approved a categorical exclusion on August 29, 1988, for Hermes III after construction was complete. The ADM

that supported the NEPA determination did not provide sufficient information to adequately assess the impacts to workers (DOE Guidance June 10, 1988), nor were potential impacts to resources (e.g., air and water quality) quantified and compared against a standard in order to determine the significance of the impact. After reviewing this file (N-40), it appears that an EA would have been the more appropriate NEPA determination. This also appears to be true for SATURN, the Particle Beam Fusion Accelerator (PBFA II), the Instrument Systems Laboratory, and the Process Development Laboratory.

The lack of NEPA documentation for research and development (R&D) activities was identified by the PTTSA Report (see significant finding number SF-NE-02) as indicating a lack of understanding by R&D organizations of NEPA requirements. Construction activities were identified as having a formal NEPA review process. The PTTSA Report identified the extensive time required for NEPA review (because of personnel shortages within DOE) as a deterrent to consideration of NEPA (SF-NE-04). The AL Self-Assessment identified the level of documentation as a deficiency (Category 7, NEPA). This deficiency resulted in incorrect decisions regarding the level of NEPA documentation because "clearly insignificant" actions or "similar to actions described in existing NEPA documentation" did not contain enough information to be audited by another organization and did not list the full range of categorically excluded options available for selection.

The root causes of this finding appear to be the lack of policy implementation, identification of procedures, and training necessary to implement the above.

FINDING NEPA/CF-4:**Tracking and Recordkeeping for NEPA and Project Documentation****Performance Objective**

DOE NEPA 5440.1C (Section 6.c.(10)) requires Responsible Supervisory Officials to establish identifiable records for all projects and activities to ensure that environmental factors are adequately considered along with other program considerations in the decisionmaking process. DOE 5440.1D (Sections 7.a.(2), 7.a.(5), 7.b.(8), 7.b.(11), and 7.c.(3)) requires DOE organizations to have recordkeeping requirements to ensure consistency. DOE 4700.1 requires application of sound management principles to provide a disciplined, systematic, and coordinated approach to project management resulting in efficient planning, organization, coordination, budgeting, management, review, and control of DOE actions. Objectives listed in Section 7 of DOE 4700.1 include monitoring (e.g., tracking) of project planning and execution, and evaluation of progress of actions in relation to specific milestones.

Finding

There is no integrated database that can be accessed by SNL, Albuquerque, KAO, and AL which is dedicated to tracking the status of a proposed project's NEPA review through SNL, Albuquerque, and DOE, or to tracking the planning, funding, approval, and construction of projects themselves within SNL, Albuquerque.

Discussion

This finding is based on interviews (I-N-1, I-N-5, I-N-28, and I-N-31) with SNL, Albuquerque, KAO, and AL personnel and examination of each of their independent NEPA tracking systems and lists of NEPA documents. In an effort to prepare a list of site projects and track their NEPA reviews, the NEPA Subteam was unable to relate the design, authorization, construction, and budgetary status of projects to the status of the NEPA review for many projects or activities because SNL, Albuquerque, KAO, and AL all had their own independent tracking systems.

Although SNL, Albuquerque, has its own recordkeeping system, it is very difficult to track the level of NEPA documentation and progress of documents along the review chain from SNL, Albuquerque, through KAO, on to AL, then to DOE HQ, and ultimately back to SNL, Albuquerque. Moreover, it is difficult to relate the status of NEPA review for a given project to its status in terms of funding, approval, design, construction, and operation. In addition to the independent SNL, Albuquerque, recordkeeping system, KAO and AL each maintain their own independent NEPA tracking systems. Although SNL, Albuquerque, KAO, and AL are cognizant of best management practices for recordkeeping, there is no recognition of the need for a commitment to centralized, integrated NEPA files.

Contributing to this deficiency is the lack of a unique identifier for each project that follows that project from submittal by the SNL, Albuquerque, project proponent through the DOE system. For example, SNL, Albuquerque, assigns an Action Description Memoranda chronological number to a project when

it is submitted to the SNL, Albuquerque, NEPA Compliance Officer (I-N-28). This identifier goes with the NEPA-related documentation associated with the project to KAO. KAO uses an independent file number for the project until it goes to AL where yet another number is assigned that stays with the project until completion. The AL number is transmitted back to KAO but not SNL, Albuquerque. In addition, planning, funding, approval, and construction for any given project may go forward independently with entirely different project numbers, thereby increasing the probability of a project advancing beyond early planning stages before the NEPA process is complete. Assignment of a unique, continuously used identifier at conception of the project would facilitate tracking and would also allow differentiation of similarly titled projects.

The AL Self-Assessment for DOE activities (Category 7. NEPA) identified the lack of a recordkeeping system at the area offices and contractors as a deficiency. This finding was partially addressed in the PTTSA Report (Finding KF-14) in which recordkeeping problems were identified. The commitment for implementation of a recordkeeping system was identified in both the PTTSA Report and AL Self-Assessment; however, a commitment to integrate the three existing systems (SNL, Albuquerque; KAO, and AL), as well as to integrate the NEPA tracking with project progress, was not recognized and has not been made. The KAO Self-Assessment (Section 3.4) was the only one of the three self-assessments to recognize the difficulty with independent tracking systems at SNL, Albuquerque, KAO, AL, and DOE HQ and the need for an integrated tracking system.

DOE HQ, AL, KAO, and SNL, Albuquerque, all share responsibility for the lack of adequate, integrated tracking and recordkeeping practices. The lack of written policies and procedures for tracking and the training of staff to implement the tracking and recordkeeping policies are probable root causes of this finding. Failure to identify the need for a fully integrated tracking system (DOE 4700.1) appears to be the cause for recordkeeping and tracking deficiencies and, therefore, constitutes an impediment to NEPA compliance. An accessible network recordkeeping/tracking system maintained jointly by SNL, Albuquerque, KAO, and AL for all SNL facilities and projects would ensure full compliance with DOE NEPA requirements.

Performance Objectives

SEN-15-90, new DOE 5440.1D (as well as old DOE 5440.1C), and the Interim Procedural Guidance for implementation of SEN-15-90 (February 5, 1990) require that the Operations Office Manager or higher DOE official make NEPA determinations early in the planning for proposed projects covered by Section D of the DOE NEPA guidelines (52 FR 47662) (NEPA determinations for proposed actions not covered in Section D are now made by EH-1 or the Secretary). All proposed actions, therefore, must be submitted to the appropriate DOE office for NEPA determinations.

Finding

Unauthorized (de facto) NEPA determinations for proposed DOE projects have been and are being made by some SNL, Albuquerque, personnel rather than by the officials authorized by DOE. AL and DOE Headquarters NEPA staff are effectively bypassed in the NEPA review of some proposed projects if SNL, Albuquerque, line management or the Facility Management and Operational Surety Branch of KAO decides further DOE NEPA review is unwarranted.

Discussion

This finding of unauthorized, de facto NEPA determinations on the part of SNL, Albuquerque, is based on interviews of SNL, Albuquerque, staff, including line management staff in several different directorates at SNL, Albuquerque, (I-N-7, -12, -13, I-N-23 through I-N-26, I-N-35, I-N-36, I-N-37, I-N-47, I-N-52 and I-N-54), and the review of various project lists and related documents (N-21, I-N-22, I-N-29, I-N-34, I-N-35, and I-N-50).

Unauthorized NEPA determinations at SNL, Albuquerque, are of two types: (1) projects that received no NEPA review at all due to general unawareness of NEPA, which includes most projects proposed prior to about 1985 (I-N-34) (this deficiency is addressed in Finding NEPA/CF-3); and (2) projects which are judged by SNL, Albuquerque, staff to need no NEPA review and are therefore not submitted to DOE for NEPA review.

Many projects commence without completion of a NEPA determination or review because SNL, Albuquerque, staff have been, and many still are, under the mistaken impression that they have the authority to determine the need for further review on the basis of their own perceptions of the hazards posed by the proposed project. If the Directorate's ES&H Coordinator, his supervisor, and the Vice President agree with that determination, then the project is likely to be authorized and implemented without DOE's concurrence on NEPA matters, contrary to DOE Orders, guidance, and SEN-15-90. A listing of Solar Thermal Test Facility Activities (N-29), for example, includes approximately 50 projects and experiments (among three SNL, Albuquerque, divisions), most of which appear to be of relatively small scale and low potential for environmental impacts, that have been or are being implemented with no NEPA review either because SNL, Albuquerque, staff were unaware of the applicability of NEPA requirements or because the staff believed they themselves could make the determination of need for NEPA review. Similarly, prior to late 1989, General Plant Projects costing less than \$150,000 were

implemented without benefit of a NEPA determination or review by DOE for the same reasons (since then, NEPA review procedures for minor General Plant Projects but not necessarily operations and maintenance activities, generally appear to have been properly implemented) (I-N-12, I-N-13, I-N-35, and I-N-52). In another research division (I-N-44), 11 of 12 activities during the last year were judged by line management to need no NEPA review; neither the SNL, Albuquerque, NEPA staff (Division 3223) nor DOE NEPA staff were notified of these activities.

Another example of unauthorized NEPA determinations relates to DOE activities on Air Force property. Presently, NEPA-related documents (e.g., Action Description Memoranda) for proposed SNL, Albuquerque, actions on Air Force-owned property are processed by the Facility Management and Operational Surety Branch of KAO and transmitted to the Air Force for a NEPA determination (I-N-30 and I-N-31). In such cases, the Air Force, rather than appropriate DOE staff, make the NEPA determination for a proposed DOE action (N-42 through N-44).

As a final example of this finding, we offer the recent instructions for integrating NEPA categorical exclusions (CX) with the SNL, Albuquerque, Environmental Restoration Program. This memorandum (N-50) states that activities that meet the eligibility requirements for a CX and that do not require documentation, require only the completion of an environmental checklist to be retained in the project files. This practice would exclude DOE NEPA staff from the NEPA review process.

The PTTSA Report partially addressed this finding in Finding SF-NE-02. The AL Self-Assessment did not address this finding. SNL, Albuquerque, has begun to correct this problem with the issuance of the NEPA Program issued January 29, 1991 (N-16), which clearly and accurately defines responsibilities for NEPA compliance at SNL. Unfortunately, the subsequent Draft NEPA Implementation Guidance (N-16) reinforces this compliance finding with statements in Appendix B (letters A and B, and the accompanying flowchart) that inaccurately imply that the SNL, Albuquerque, line organization is permitted to make NEPA determinations for those categories of actions specifically listed in Section D of the NEPA Guidelines.

The apparent causal factors for this finding are inadequate oversight of NEPA implementation at all levels of DOE and at the program level and below, and inadequate guidance and training for SNL, Albuquerque, staff who can propose and approve projects/activities.

3.5.9.3 Best Management Practice Finding

FINDING NEPA/BMPF-1: KAO NEPA Reviews

Performance Objective

Best management practices dictate that the NEPA review and oversight be centralized and conducted by staff members within the same branch at the Kirtland Area Office (KAO) to improve effectiveness and efficiency. Among the objectives of DOE 4700.1 are (1) to ensure proper coordination by all appropriate line and staff elements beginning with program or project inception (Section 7.c.(2)), and (2) to provide visibility for all key decisions and timely feedback for all levels of management, and maintain accountability through and across all levels of the organization with the minimal amount of procedures and paperwork (Section 7.c.(7)).

Finding

NEPA documentation of proposed SNL, Albuquerque, activities on Air Force-owned land is transmitted by the Facility Management and Operational Surety Branch (FMOSB) of KAO, rather than the Environment, Safety, Health Compliance Branch (ESHB) of KAO which normally processes all other NEPA reviews of SNL activities. This unconsolidated NEPA documentation process within KAO is inefficient and could lead to delays in or absence of DOE NEPA determinations (I-N-30 through I-N-3).

Discussion

Separating the NEPA responsibility within KAO has resulted in a process where tracking systems and documentation for DOE actions occurring on Air Force land are not interconnected. The FMOSB tracking system for projects which require Air Force approval is project-specific and is not integrated with the one used by ESHB (see related Finding NEPA/CF-4). Additionally, AL 1120, Chapter IV, Part 184.B.(8), indicates that ESHB is responsible for KAO's NEPA program and all environmental documentation at all assigned facilities (N-41). Although there has been recent coordination between these two branches, the result of the split in NEPA documentation activities is a less-effective NEPA review program than if one branch has the responsibility for written procedures and tracking all NEPA actions. Currently, the ESHB staff are designated members (with FMOSB staff relegated to an observer role) of the Air Force Environmental Protection Committee (EPC) that makes most of the Air Force's NEPA determinations and are supposed to be made aware of DOE activities that are proposed on Air Force lands. Formerly, without ESHB involvement on the EPC, and because ESHB was not the transmitter of the AF Form 813 to EPC, there have been instances resulting in the Air Force making NEPA determinations on DOE actions, which occurred on Air Force land, without DOE's (KAO-ESHB, AL and DOE HQ) knowledge. In any case, ESHB participation on the Air Force Environmental Protection Committee does not constitute sufficient DOE NEPA review (see related Finding NEPA/CF-3). It must be noted that all DOE projects are required to have DOE NEPA approval before an action can occur. It is also understood that because DOE requires that all proposed projects have DOE approval, there will be some duplication of NEPA effort when an action is proposed on Air Force land.

Recent AL guidance (N-13) requires all NEPA documentation requiring a DOE NEPA determination to be appropriately transmitted from ESHB. However, this guidance only addresses NEPA-related documentation transmitted from SNL to ESHB to AL. It does not refer to NEPA documentation for DOE activities on Air Force-owned land that is transmitted from SNL to FMOSB to the Air Force. For such actions, NEPA documentation could be transmitted inappropriately from FMOSB to the Air Force without ESHB or AL's knowledge, and thus, there are some activities that could receive Air Force NEPA approval but not DOE NEPA approval.

This best management practice finding was not identified in the self-assessment reports prepared for either AL or KAO. DOE HQ, AL, and KAO all share responsibility for this unconsolidated NEPA review process at the site. Factors that contribute to this finding include lack of oversight and lack of knowledge and experience with NEPA.

3.6

NOTEWORTHY PRACTICE

FINDING NWP-1:

Enhancement of ES&H Awareness

The universe of ES&H requirements that apply to DOE facilities, including SNL, Albuquerque, is extremely broad and complex. SNL, Albuquerque, has prepared two documents that should serve as valuable resources in helping site personnel better understand these requirements. The first is a wall chart, "Sandia National Laboratories Environment, Safety and Health Requirements," that summarizes at a glance the various Federal (DOE, EPA, DOD, DOT, DOI), State and local laws, and DOE Orders that apply to SNL, Albuquerque, operations and illustrates how these requirements feed into the process of preparing AL ES&H Orders and SNL ES&H Policies, Programs, the ES&H Manual, Standard Operating Procedures, and finally, Operating Procedures. The second is a document titled "Summaries of Requirements of DOE Orders with ES&H Content," which includes a summary of pertinent sections of each DOE Order that contains ES&H requirements that apply to SNL, Albuquerque. In addition, a fact sheet is provided for each Order that identifies the SNL organization and individual with primary responsibility for ensuring compliance with those requirements. Both documents should help SNL, Albuquerque, personnel better fulfill their ES&H responsibilities by enhancing their awareness and understanding of the ES&H requirements that apply to them.

4.0

Safety and Health Assessment

4.0 SAFETY AND HEALTH ASSESSMENT

4.1 PURPOSE

The purpose of the Safety and Health (S&H) Subteam assessment was to determine the effectiveness of representative safety and health programs at the Sandia National Laboratories (SNL), Albuquerque. A Technical Safety Appraisal (TSA) team was assembled for this purpose by the Department of Energy (DOE) Deputy Assistant Secretary for Safety and Quality Assurance, Office of Safety Appraisals (OSA). The S&H Subteam assessment was performed concurrently with assessments conducted by Environmental and Management Subteams.

4.2 SCOPE

Within the safety and health programs of SNL, Albuquerque, performance was appraised in the following technical areas: Organization and Administration, Quality Verification, Operations, Maintenance, Training and Certification, Auxiliary Systems, Emergency Preparedness, Technical Support, Packaging and Transportation, Nuclear Criticality Safety, Security/Safety Interface, Experimental Activities, Site/Facility Safety Review, Radiological Protection, Worker Safety and Health (OSHA) Compliance, Industrial Hygiene, Occupational Safety, Fire Protection, Medical Services, Explosives Safety, and Firearms Safety.

4.3 APPROACH

The TSA team was composed of DOE personnel, employees of DOE contractors, and outside consultants. The TSA was conducted according to the DOE/EH-0129, "Procedures for Conducting Technical Safety Appraisals," February 1991.

The S&H Subteam assessment was led by two Team Leaders from OSA and conducted from April 15 through May 14, 1991. Guidance and direction were provided by the Deputy Assistant Secretary for Safety and Quality Assurance. A list of the Subteam members, together with their areas of responsibility, is provided in Section 4.9; biographical sketches of the Subteam members are provided in Appendix A-3.

A TSA is designed to be operationally focussed. Therefore, the evaluation by the S&H Subteam focussed on safety operations and the condition of equipment and facilities. This approach is based on the assumption that the facility and its equipment have been appropriately designed and constructed. Each appraisal addresses whether current operations are being conducted within the scope of operational safety procedures and programs established for specific facilities and activities.

The activities of the S&H Subteam were guided by the performance objectives and supporting criteria contained in DOE/EH-0135, "Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites," June 1990, and supplemented with new sections drafted in April 1991 for Explosives Safety and Firearms Safety.

The findings and resulting concerns identified by the S&H Subteam were developed using the performance objectives established for each of the technical areas evaluated. Although nearly all of the performance objectives

were addressed, this report cites only those performance objectives for which a concern was identified. Therefore, the reader is cautioned against forming an opinion of the safety and operational performance within a technical area without first reading the overview concerning that area. When a performance objective is not listed, the omission implies that the Subteam judged all applicable criteria to be met.

The findings and concerns identified by the S&H Subteam were obtained in three ways: (1) observing routine operations, emergency exercises, and the physical condition of the site and facilities; (2) interviewing management, staff, operators, and craft personnel; and (3) reviewing policy statements, records, procedures, and other relevant documents. In addition, the SNL, Albuquerque, self-assessment, SAND90-2827, "Pre-Tiger Team Self-Assessment Report," January 1991, and "DOE-AL Self-Assessment Report," April 1991 were reviewed. The Subteam also received a large number of documents containing results from the Self-Assessment Jump Start exercises conducted throughout SNL, Albuquerque, to train line staff in self-appraisal and to find and mitigate serious hazards. Since many of these reports were still in draft form, the Jump Starts were not formally evaluated as part of the overall Subteam effort. A comparison of Self-Assessment problem identification with TSA concerns is presented in Table 4-1.

A concern addresses a situation that in the judgment of the S&H Subteam either (1) reflects less than full compliance with a DOE safety and health requirement or mandatory safety standard; (2) threatens to compromise safe operation; or (3) if properly addressed, would substantially enhance the excellence of a particular situation, even though that part of the operation is judged to have a currently acceptable margin of safety. Because this last category addressed the excellence of operation, more concerns are reported than would result from a strictly compliance-oriented appraisal.

For each of the following technical area summaries, the findings that support each concern immediately precede the concern. The category rating, potential hazard level, and level of compliance for each concern were determined by using the criteria presented in Section 4.7. A Tabulation of Concerns from this appraisal is contained in Section 4.8.2.

A Technical Safety Appraisal was performed of Sandia National Laboratories' Sandia Pulse Reactor III and the Annular Core Research Reactor in August 1988. To preclude confusion of concern numbering during development of the corrective action plan, the concerns developed during this assessment are numbered consecutively from the concerns listed in DOE/EH-0087, April 1989. It should be noted that new findings determined during this assessment, but related to the older concerns in DOE/EH-0087, are contained in this assessment report. Therefore, a reevaluation of corrective actions on the concerns in DOE/EH-0087 should be accomplished to integrate actions required by the new findings and concerns contained in this assessment. (A tabulation of the concerns from DOE/EH-0087 is contained in Section 4.8.3.)

A comprehensive Occupational Safety and Health Act (OSHA) compliance appraisal covering general industry and construction worksites was performed. The scope of this OSHA-type appraisal involved 31 of the major laboratories, process, service, and maintenance buildings and 10 construction sites where the majority of employees worked. This part of the appraisal effort focuses on

serious noncompliance issues rather than on those designated as "other than serious." Furthermore, de minimis issues noted during the appraisal are not included in the inspection forms. (See Appendix F.)

Drawing upon the extensive experience of its appraisers, the S&H Subteam has made an effort to identify some of the responsible factors in each statement of concern. However, the Subteam recognizes that this effort has limitations because Subteam members are not fully familiar with the details of the day-to-day operations at SNL, Albuquerque. Therefore, the S&H Subteam believes SNL, Albuquerque, should consider the findings, as well as the statements of concern, as possibly symptomatic of some set of deeper root causes. Finally, SNL, Albuquerque, and American Telephone and Telegraph (AT&T) management should search out and correct those root causes to ensure that improvements in the safety of the operation will be sustained.

4.4 SAFETY AND HEALTH ASSESSMENT SUMMARY

The Safety and Health program at SNL, Albuquerque, was in a state of flux while the Subteam was at the site. Recent organization changes had been made, and revision of the entire hierarchy of safety documentation was underway. Corrective action from previous self-assessments was also underway. This resulted in a high level of emphasis and strong staff and line management support for achieving a new safety culture. A total of 243 concerns are presented in this Safety and Health Assessment; 218 concerns are addressed to the site contractor, 24 are targeted specifically at the Albuquerque Operations Office (AL), including the Kirtland Area Office (KAO), and one is directed to DOE Headquarters (HQ). One concern, regarding the lack of a machine guard and an unsafe work practice, which presented a clear and present danger, was judged to be a Category I concern. In addition, seven concerns were judged to address a significant risk or substantial noncompliance with DOE Orders, and were, therefore, judged to be Category II. These concerns included: (1) an ineffective radiation survey program for excessed materials released to the public; (2) potential spread of radioactive contamination because of unmarked contaminated areas and improper egress surveys; (3) three concerns regarding cranes and hoists; i.e., an ineffective program for their inspection, testing, maintenance, repair and operation; training inadequacies for crane inspectors; and noncomplying construction contractor hoisting and rigging operations; (4) deficient guarding on machines and tools with moving and rotating parts; and (5) widespread electrical system hazards.

SNL, Albuquerque, was in the process of rewriting and implementing their total quality program at the time of the assessment, including provisions for environment, safety, and health (ES&H) quality verification. Very little of this had been fully implemented and there was no clear perception of an accurate schedule. In most instances, thorough and detailed corrective action plans and schedules were not available. Management had not established the policies that typically support operations. Consequently, there were varying degrees of formality in the conduct of operations, and of noncompliance with DOE Orders, from one facility to another.

SNL, Albuquerque, did not have a clearly stated maintenance policy for real property or for programmatic property, as required by DOE 4330.4A. The Facility Operations and Maintenance Department was aggressively pursuing a program to bring their operations dealing with real property into compliance

with the Order; however, the programmatic organizations had not initiated activities in this area. There were several notable instances of poor maintenance practices, particularly with regard to cranes, low-voltage electrical systems, and general housekeeping. There is an uncertainty with regard to ownership and responsibility for maintenance on the part of management, supervision, and craftpersons. In auxiliary systems, some deficiencies were noted for older and smaller projects and for the lack of some formal documentation and specifications. Concerns were also noted for the holdup and treatment of liquid and gaseous effluents, the storage of fissile materials, and the servicing and maintenance of ventilation systems. Technical support of programmatic facilities was initiated and controlled by the facility manager. This led to a considerable variation in the quality of procedures and work packages.

Some pockets of good training practices existed at SNL, Albuquerque, but most training was informal and undocumented, and had not been effectively and consistently implemented. Management had established neither policies nor procedures that provided the elements and bases for a formal training program. With regard to explosives safety, there was no formal effort to establish a continuing training program. Sufficient ES&H professional staff, knowledgeable in explosives safety matters, was not available to provide independent appraisal or day-to-day oversight of explosives operations. Independent safety reviews by committee were not required throughout SNL, Albuquerque. This has resulted in independent reviews being performed by one individual in the ES&H Directorate, with no assurance that multidisciplinary reviews would be performed. Also, the content and effectiveness of reviews are questionable. In addition, triennial appraisals have not been conducted for all facilities, and when they have been conducted, they have not met DOE requirements for independency. The timeliness of responses and the approach to implementation of safety-related requirements by the safety committees and ES&H indicated that SNL, Albuquerque, had not implemented a disciplined, safety-oriented approach to the review of experimental activities.

With regard to emergency preparedness, improvements were needed or desirable especially in the areas of communications, training, prioritization of programs and resources, and further development of preparedness to cope with offsite threats. The Packaging and Transportation operations were being performed safely; however, there is potential for error. Some deficiencies were identified; and work, planning, and action plans were in progress to correct the deficiencies. The nuclear criticality safety program at SNL, Albuquerque, is of high quality. However, several easily correctable concerns were expressed related to reviews, analyses, documentation, and mass limit postings.

The role of security forces in emergency situations and definition of that role were quite good in most respects. However, a few inconsistencies and omissions in Security Operations Orders regarding emergency access and egress were identified. Deficiencies were identified in the review process for facility modifications, but these are generally applicable to modifications of all kinds, and not specific to security-related modifications. Currently, the SNL, Albuquerque, Firearms Safety Program is effectively implemented only with regard to the use of firearms by the protective force. Serious concerns, however, are noted as being in noncompliance with DOE 5480.16 and AL 5480.16 for firearms use by organizations other than the protective force.

The SNL, Albuquerque, Medical Program is effective in many ways, but has been operating on the principles of sound occupational and preventive medical practices rather than adherence to DOE or OSHA requirements. The Fire Protection Engineering staff has a basic program of inspections, testing, and maintenance of the fire protection systems and a building inspection. However, due to resource constraints, these programs were not being conducted to the level, detail, or frequency as required by DOE Orders, National Fire Protection Association (NFPA) Codes, or the "improved risk" guidelines of the fire insurance industry.

The Radiological Protection Program has been conducted in a relatively informal manner. A much more formal program has been prepared but not yet implemented. As a result, practices were inconsistent across the site, some contamination controls had been neglected, and radioactive materials and contaminated facilities had been allowed to accumulate, which led to two significant concerns. The worker safety appraisal identified 433 noncompliance issues. Of these, 417 were considered serious (96%) and 16 were classified other than serious (4%). The high percentage of serious noncompliance issues results from the emphasis on identifying that level of deficiency. The Industrial Hygiene Program lacked an aggressive facility or process surveillance program. The written Industrial Hygiene Program was in place, but the program was so new that implementation had yet to begin, in most cases. With regard to occupational safety, the key issues identified related to the historical absence of professional safety and health overview of the SNL, Albuquerque, safety program and the lack of definitive program documentation establishing how SNL, Albuquerque, would establish and operate an Occupational Safety Program.

In conclusion, many safety improvements were in progress, but much work is still needed to arrive at the new safety culture desired by both SNL, Albuquerque, management and staff. Program changes that are underway need to be accelerated and procedures developed to fully implement these new programs. Safety excellence programs need to be promoted rather than simply striving for compliance. The independent safety appraisal program needs to be emphasized as a means of overseeing line safety, and a strong self-assessment program needs to be fully institutionalized.

TABLE 4-1

Comparison of Self-Assessment Problem Identification with TSA Concerns
(Number of Self-Assessment and TSA Concerns/Percentage of TSA Concerns/TSA Discipline by Seriousness Category)

TSA Discipline	Category I			Category II			Category III		
	Self	TSA	%TSA	Self	TSA	%TSA	Self	TSA	%TSA
Organization & Administration							15	19	79
Quality Verification							9	10	90
Operations							15	18	83
Maintenance							20	22	91
Training & Certification							3	4	75
Auxiliary Systems							6	7	86
Emergency Preparedness							3	9	33
Technical Support							1	3	33
Packaging & Transportation							9	9	100
Nuclear Criticality Safety							1	10	10
Security/Safety Interface							2	6	33
Experimental Activities							4	5	80
Site/Facility Safety Review							4	4	100
Radiological Protection				2	2	100	11	22	50
Worker Safety & Health	1	1	100	5	5	100	14	14	100
Industrial Hygiene							7	13	54
Occupational Safety							10	12	83
Fire Protection							7	10	70
Medical Services							5	8	63
Explosives Safety							0	8	0
Firearms Safety							1	14	7
AL-Firearms Safety							0	8	0
Totals	1	1	100	7	7	100	147	235	63

Note: "% TSA" column indicates the percentage of TSA concerns identified (in whole or in part) in the SNL PTISA and the AL self-assessment reports.

4.5 SAFETY AND HEALTH FINDINGS AND CONCERNS

4.5.1 Organization and Administration

4.5.1.1 Overview

The S&H Subteam appraisal of Organization and Administration was performed by interviewing the SNL President, both Executive Vice Presidents, and SNL, Albuquerque, management including one Vice President and various directors, managers, and supervisors. Technicians, craft personnel, and operators were also interviewed. Interviews were held with executives of the Metal Trades Union, AL and KAO. SNL and DOE documents were reviewed, and a general tour was made of SNL, Albuquerque. All of the performance objectives and criteria pertaining to Organization and Administration were addressed. Concerns are noted in all eight of the performance objectives.

The organization and administration of programs at SNL, Albuquerque, was in a state of flux while the team was at the site. SNL management reviewed the SNL, Livermore, Tiger Team Assessment of May 1990, and began making applicable changes to the organization and administration of ES&H programs at Albuquerque. In addition, SNL, Albuquerque, completed an in depth Pre-Tiger Team Self-Assessment (PTTSA) in January 1991, and issued an action plan to start correcting noted deficiencies. SNL, Albuquerque, also initiated Vice President level self-assessments that involved a large percentage of the SNL management and staff. Corrective action was underway for these self-assessments at the time of the S&H Subteam appraisal. In many cases, programs were defined and assigned but not yet started. In other cases, programs were only partially defined. Policies, management procedures, and Standard Operating Procedures were being developed, sometimes in the correct order; however, at other times, lower level procedures were being developed before upper level documents were finalized.

SNL, Albuquerque, management and staff exhibited a sincere effort to find and correct deficiencies, and to develop a program that could achieve safety excellence. The PTTSA and the Self-Assessment Jump Start was a good first effort. In general, there is currently a high level of emphasis on safety at SNL, Albuquerque. Most of the management and staff interviewed expressed strong support for the change. Staff members generally expressed a high regard for SNL, Albuquerque; however, some feel that there is an adversarial interface between the Union and Laboratory management.

Many omissions or deficiencies in management tools are recognized and are being corrected. These include: (1) development of job descriptions that include line safety responsibilities; (2) adding safety as an element in the personnel performance evaluations; (3) development of self-assessment and independent safety appraisal programs; (4) development and promulgation of safety goals; (5) plotting and trending of performance indicators; (6) requiring management presence in the workplace; (7) insufficient routine ES&H oversight of SNL by AT&T; (8) the lack of assurance in the control of controlled documents and the preservation of important or vital records; and (9) improving the substance abuse program.

Other concerns noted by this appraisal which are not currently being worked include other management tools such as: (1) infrequent safety meetings and

the lack of purpose for some safety meetings; and (2) the lack of clarity in authority to accomplish the responsibilities associated with space ownership.

The concerns regarding AL and KAO include: (1) lack of definition of stop-work authority; (2) lack of policies and procedures regarding operational readiness review, restart, Safety Analysis Report (SAR) revision, etc.; (3) lack of safety goals and objectives; (4) lack of an institutionalized self-assessment program; (5) inadequate document control program; and (6) lack of assurance that SNL, Albuquerque, facilities will receive an adequate risk assessment.

In conclusion, the staff is well qualified and dedicated to doing a good, safe job. Most of those interviewed knew that they had stop-work authority and would refuse to perform a task if they felt that it was unsafe. In most cases, there is a strong company loyalty with a very small turnover of staff. Many safety improvements are in progress, but much more work is needed to arrive at the new safety culture desired by both management and staff.

4.5.1.2 Findings and Concerns

OA.1 SITE/FACILITY ORGANIZATION

PERFORMANCE OBJECTIVE: Management should organize and manage the site/facility's work, programs, and resources so that safety and health are an integral part of the personnel duties and requirements, and are consistently implemented.

- FINDINGS:**
- Some management personnel stated that they did not have a formal job description.
 - Other management personnel stated that they had a listing of "task assignments," "assignments of responsibility," "assigned goals and objectives," or other means of defining their responsibilities.
 - Some management personnel stated that authorities and responsibilities were only verbally assigned.
 - Some stated that responsibilities were more clearly defined than authorities.
 - Not all those who had responsibilities assigned in some written form had safety as a responsibility.
 - See Concerns OP.1-3, TS.1-2, and MA.1-2.
 - This Concern was addressed in the PTTSA.

CONCERN:
(OA.1-4)
(H2/C1)

Individual formal job descriptions, including assignments of safety responsibilities and commensurate delegation of authority to accomplish the safety responsibilities, do not exist, as required by DOE 5480.19, for many management and staff personnel.

- FINDINGS:**
- There is a Laboratory requirement that safety meetings be held at least semiannually; however, some organizations are holding safety meetings as frequently as once per week, while others reported that they never hold safety meetings.
 - There is no requirement or policy regarding the purpose of safety meetings or what should be accomplished in a safety meeting; therefore, safety meetings take various forms including activities or events that are required for other purposes, to fulfill the requirement for holding safety meetings.
 - The requirement for at least semiannual safety meetings for personnel working in relatively moderate to high hazard-potential facilities does not meet industry standards.
 - Lessons learned from unusual occurrences within SNL and applicable events from other DOE facilities are not routinely discussed in safety meetings in an effort to learn from other experiences.

- See Concern ES.1-1.
- This Concern was not addressed in the PT TSA.

CONCERN: Regularly scheduled safety meetings do not always occur, and the scheduled frequency and purpose do not always meet industry standards.
(OA.1-5)
(H2/C2)

FINDINGS:

- AL employees generally understand most responsibilities and authorities; however, some authorities are not clear; e.g., stop-work authority. AL has recognized this concern, and is trying to clarify this rather complicated issue.
- This Concern was addressed in the AL Self-Assessment.

CONCERN: Stop-work authority of the Albuquerque Operations Office personnel is not well defined.
(OA.1-6)
(H2/C2)

FINDINGS:

- Responsibilities and authorities of KAO staff are not completely understood. Stop-work authority is not defined. KAO has recognized this concern, and is trying to clarify this rather complicated issue.
- This Concern was addressed in the AL Self-Assessment.

CONCERN: Stop-work authority of the Kirtland Area Office personnel is not well defined.
(OA.1-7)
(H2/C2)

OA.2 ADMINISTRATION

PERFORMANCE OBJECTIVE: Administrative programs and controls should be in place to ensure policies concerning health and safety are administered throughout the facility.

- FINDINGS:**
- The Laboratory recently assigned space ownership within buildings to designated individuals to be responsible for the housekeeping and other safety issues within the assigned space. This system assigns ownership of all space to some individual.
 - Many assignments are to staff level people such as secretaries, craftsmen, and technicians.
 - Responsibility for the assigned space is designated; however, duties are not always defined.
 - It was reported that some assignees feel that they have responsibility without a commensurate level of authority to fulfill the responsibility.
 - This Concern was not addressed in the PTTSA.

CONCERN: The assignment of responsibility for assuring the safety within
(OA.2-1) designated space at the Laboratory is not well understood, and
(H2/C2) does not always have the accompanying delegation of authority to
 accomplish the assigned responsibilities.

- FINDINGS:**
- It was reported that SNL, Albuquerque, does not currently have a fully implemented ongoing self-assessment program, nor all elements of an independent, safety appraisal program.
 - SNL, Albuquerque, performed a PTTSA and issued a report dated January 1991.
 - A document, PY471000, "ES&H Policy, Requirements, and Responsibilities," December 1990, assigns responsibilities for a line safety self-assessment program and for an independent safety appraisal program as required by DOE 5480.5, DOE 5480.6, DOE 5480.19, and DOE 5482.1B.
 - The SNL, Albuquerque, Vice Presidents have initiated a first step at self-assessment by involving a large percentage of the staff in an effort called Self-Assessment Jump Start. This first step was primarily worker safety and environment oriented; however, a program is not in place to routinely perform the self-assessments, as outlined in PY471000.
 - The independent safety appraisal program has been assigned to the ES&H Regulatory Assessment Division; however, resources are not available to complete the assigned task.

- See Concerns FR.1-1, FR.1-2, EA.2-2, EA.2-3, PT.1-1, PT.11-1, RP.2-3, ES.1-2, OS.1-1, and QV.1-3.
- This Concern was addressed in the PTTSA.

CONCERN:
(OA.2-2)
(H2/C1)

Sandia National Laboratories, Albuquerque, does not currently have a fully institutionalized self-assessment program nor all elements of an independent safety appraisal program, as required by DOE 5480.5, DOE 5480.6, DOE 5480.19, and DOE 5482.1B.

FINDINGS:

- AL has established a policy for Operational Readiness Reviews and restart. However, AL has not established procedures for these important safety-related activities, as required by SEN-16A-90, August 3, 1990.
- This Concern was addressed in the AL Self-Assessment.

CONCERN:
(OA.2-3)
(H2/C1)

Procedures for some safety-related activities, including Operational Readiness Reviews, restarts, and revisions to Safety Analysis Reports are not in place in the Albuquerque Operations Office, as required by SEN-16A-90.

FINDINGS:

- Specific quantitative objectives that emphasize the KAO commitment to safety are not yet in place.
- This Concern was addressed in the AL Self-Assessment.

CONCERN:
(OA.2-4)
(H2/C2)

The Kirtland Area Office safety goals and objectives are not specifically quantified or documented with regard to their oversight of Sandia National Laboratories, Albuquerque.

OA.3 MANAGEMENT OBJECTIVES

PERFORMANCE OBJECTIVE: Site/facility management objectives should ensure commitment to safe operation, including enforcement of approved work practices and procedures.

- FINDINGS:**
- It was reported by many of those interviewed that they were not aware of any written safety goals, nor were they aware of any requirement to establish goals.
 - A few stated that as low as reasonably achievable (ALARA) was a written goal that was actively pursued, while others stated that ALARA was not an official program.
 - Some stated that they had personal goals or that their organization had goals; however, most were not in writing.
 - Some corporate documents include strategic goals and other long-range safety goals, but most are objectives that are not clearly discernable when achieved.
 - See Concerns OP.1-1 and IH.1-2.
 - This Concern was addressed in the PTTSA.

CONCERN: Definitive goals are not set and promulgated as a means of
(OA.3-1) promoting a unified effort to achieving excellence in safety
(H3/C1) issues, as required by DOE 5480.19.

OA.4 CORPORATE SUPPORT

PERFORMANCE OBJECTIVE: Corporate interest and support for safe operation should be evident.

- FINDINGS:**
- The contract for the operation of SNL is an agreement between the DOE and AT&T, with Sandia Corporation being a party to the prime contract, and includes, as an appendix, the contract between Sandia Corporation and AT&T. The Sandia Corporation is a wholly owned subsidiary of AT&T.
 - Under the provisions of this contract, Sandia Corporation acts as an agent for, and on behalf of, the DOE for certain purposes. Sandia Corporation, therefore, becomes a party to the contract and assumes all of the obligations imposed by the contract.
 - AT&T performs periodic audits of the Sandia Corporation as required by contract; however, ES&H audits are not required.
 - AT&T has, upon request, performed functional safety audits, such as the recent packaging and transportation audit.
 - It was reported that AT&T plans to increase its ES&H oversight of the Sandia Corporation.
 - This Concern was not addressed in the PT TSA.

CONCERN: The Sandia Corporation Board of Directors has not requested that
(OA.4-4) the American Telephone and Telegraph Company provide routine
(H2/C2) oversight of the environment, safety, and health parts of the
 contract.

OA.5 MANAGEMENT ASSESSMENT

PERFORMANCE OBJECTIVE: Management and supervisory personnel should monitor and assess facility activities to improve performance in all aspects of the operation.

- FINDINGS:**
- Currently, there is no program for plotting and trending performance indicators including root causes of unusual occurrences and incidents.
 - The responsibility for the performance indicator program has been assigned to the ES&H Regulatory Assessment Division.
 - An outline of a program to be implemented is contained in PG470095, "ES&H Performance Indicator," January 1991.
 - See Concern OP.1-1.
 - This Concern was partially addressed in the PT TSA.

CONCERN: A program to plot, trend, and evaluate performance indicators has
(OA.5-1) not yet been implemented.
(H2/C2)

- FINDINGS:**
- There is no SNL, Albuquerque, policy or requirement regarding management walkthroughs in the workplace or time spent in the workplace; however, there is a new requirement that management personnel perform a management surveillance of all facilities and project activities under their preview on a periodic basis as follows:
 - Directorate Directors - at least annually.
 - Department Managers - at least semiannually.
 - Division Supervisors - at least quarterly.
 - Upper level management personnel are infrequently in the workplace.
 - The action or purpose to be accomplished during a management walkthrough is not defined.
 - This Concern was partially addressed in the PT TSA.

CONCERN: There is no requirement for frequent management walkthroughs in
(OA.5-2) the workplace or definition of the purpose to be accomplished by
(H2/C1) these walk throughs or other presence in the workplace, as
 required by DOE 5480.19.

- FINDINGS:**
- AL has conducted a self-appraisal, the results of which were documented in "DOE-AL Self-Assessment Report," April 1991.
 - AL recognized that a self-appraisal program needs to be established in their organization, but only preliminary thinking has been done on this to date.

- This Concern was addressed in the AL Self-Assessment.

CONCERN:
(OA.5-3)
(H2/C2)

There is no institutionalized self-appraisal program for the Albuquerque Operations Office.

OA.6 PERSONNEL PLANNING AND QUALIFICATION

PERFORMANCE OBJECTIVE: Personnel programs should ensure that appropriate job qualification requirements or position descriptions are established for all positions that affect safe and reliable operation.

- FINDINGS:**
- Performance evaluations of management and staff are usually performed annually; however, some stated that their evaluation was performed informally with nothing in writing.
 - Safety has not consistently been an element in the performance evaluations.
 - A recent directive requires that safety be included in future performance evaluations.
 - This Concern was partially addressed in the PT TSA.

CONCERN: Performance evaluations have not always included safety as an evaluation element.
(OA.6-2)
(H2/C2)

OA.7 DOCUMENT CONTROL

PERFORMANCE OBJECTIVE: Document control systems should provide correct, readily accessible information to support site/facility operations.

- FINDINGS:**
- It was reported that there is no uniform method of updating controlled documents, and that the method for updating was determined by the issuing organization.
 - Those interviewed were not aware of any independent audit system for assuring that controlled documents are kept current.
 - It was also reported that there is no requirement for a formal periodic review of all controlled documents.
 - See Concerns OP.3-8 and OP.3-9.
 - This Concern was partially addressed in the PT TSA.

CONCERN: There is no uniform requirement for periodic review and update of
(OA.7-2) controlled documents, and no independent audit system to assure
(H2/C1) that individual copies of controlled documents are maintained
 current, as required by DOE 5480.19.

- FINDINGS:**
- DOE 1324.2A, NFPA 232, and American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance Standard One (NQA-1)-1989, "Quality Assurance Requirements for Nuclear Facilities," all require that important records be stored in either fire-proof vaults, or that two separate records be maintained in different locations.
 - It was reported that important records in Technical Area V were not stored in fire-proof vaults, and that the two separate records method had been elected. It was also reported that in some cases, separate records were not being maintained in different buildings, and, in other cases, separate records did not exist.
 - See Concerns TC.1-3, MA.8-1, and MS.1-1.
 - This Concern was partially addressed in the PT TSA.

CONCERN: Important records are not always stored in accordance with the
(OA.7-3) requirements of DOE 1324.2A, NFPA 232, and ASME NQA-1-1989.
(H2/C1)

- FINDINGS:**
- The procedure for receipt, review, and distribution of documents has been improved recently by AL. A system is in place for some types of documents; e.g., directives and memoranda.
 - A reliable, auditable system for management of all incoming and outgoing documents does not exist, particularly for policy documents.

- This Concern was addressed in the AL Self-Assessment.

CONCERN:
(OA.7-4)
(H2/C2)

The Albuquerque Operations Office document control system does not ensure a reliable auditable system for managing all incoming and outgoing documents.

FINDINGS:

- Facilities that involve nuclear materials in SNL, Albuquerque, Technical Area V have Technical Specifications and SARs.
- Major facilities at SNL, Albuquerque, have a Preliminary Hazards Analysis developed by the facility "owner."
- AL has established the requirements for risk assessment and documentation in AL 5481.1B. However, AL does not have a plan or schedule for developing SNL, Albuquerque, risk assessments or appropriate Safety Assessments or SAR documentation where needed.
- This Concern was not addressed in the AL Self-Assessment.

CONCERN:
(OA.7-5)
(H2/C2)

There is no plan in the Albuquerque Operations Office to ensure that Sandia National Laboratories, Albuquerque, facilities will receive adequate risk assessment and documentation.

OA.8**FITNESS FOR DUTY**

PERFORMANCE OBJECTIVE: A Fitness for Duty Program should be capable of identifying persons who are unfit for their assigned duties as a result of drug or alcohol use or other physical or psychological conditions, and should provide procedures to remove them from such duty and from access to vital areas of the site or facility pending rehabilitation or remedial actions.

- FINDINGS:**
- The Laboratory started pre-employment drug screening in October 1990.
 - New hires receive a brief introduction to substance abuse and the availability of the Employee Assistance Program.
 - Random drug testing of the "Protective Force" was started in 1987.
 - Some management personnel stated that the substance abuse training for managers and supervisory personnel, presented several years ago, was optional, while others stated that attendance at the substance abuse training was mandatory. There is no refresher or repeat training planned.
 - New supervisory personnel receive substance abuse training.
 - Some supervisory personnel and many staff level personnel stated that they have not received any training in substance abuse.
 - Personnel Security Assurance Program (PSAP) designated personnel are not receiving drug testing, as required by DOE 5631.6; however, phased implementation is required by April 1992.
 - PSAP designated personnel are those who are in a position where they could remove or misuse Category 1 quantities of special nuclear material, damage a nuclear reactor, or could otherwise cause unacceptable damage to national security.)
 - The SNL, Albuquerque, substance abuse policy is not enforced upon all long-term unescorted visitors and contractors.
 - This Concern was addressed in the PT TSA.

CONCERN:
(OA.8-1)
(H2/C2)

Not all who are in a position to cause serious harm or damage to people, property, or the environment are trained and periodically tested for substance abuse.

4.5.2 Quality Verification

4.5.2.1 Overview

The Quality Verification appraisal encompassed all seven performance objectives, and consisted of document and facility reviews and interviews with cognizant line and staff personnel. Buildings and facilities visited include Bldg. 980 for document reviews and counterpart interviews, Bldg. 957 (Receiving and Shipping), Bldg. 800 (Procurement Offices), Bldg. 890 (Space Systems Department), Bldg. 6588 (Research Reactors), Bldg. 856 (Continuing Technical Education and Training Division), Bldg. 892 (Office of the Director, Quality Improvement; Office of the Manager, Weapons Process Quality; and Office of the Division Supervisor, Process Quality Division), Bldg. 867 (Storage Division), Trailer M0172 (Office of the Department Manager, Corporate Quality), Bldg. 805 (Primary Standards Laboratories), Bldg. 857 (Special and Discrete Semiconductor facilities), Alliance Technology and All Tech subcontractor facilities in the Alliance Triad Building, Bldg. 840 (Machine and Measurement Shops), Trailer M0204 (Office of the Metallurgical Processes Division Supervisor), Bldg. 841 (Welding Shops), Bldg. 860 (Nondestructive Testing Laboratories), AL Trailer MOD 17 (Office of the Director, Operations Quality Division) Bldg. 892 (Safety and Surety Components Division facilities), Bldg. 807 (Office of the Supervisor, Fire Set and Contact Fuze Division), and Bldg. 836 (Office of the Supervisor, Trident II Arming, Fuzing, and Firing Division).

A total of 10 concerns were developed that focused primarily on the absence of provisions for independent verification sitewide, and a failure to provide appropriate guidance and oversight in many instances. One of the concerns addressing lack of oversight was directed to AL. Some concerns addressed a lack of formality in operations, and that procedures were not current because they are being newly developed or extensively revised. The lack of training requirements specifically directed to quality verification was also cited, although there are several examples of excellent performance in this area. Some programmatic concerns were addressed to calibration, inspections, special process control, and hardware/material identification and handling areas, although examples of excellent performance were also found in each.

In particular, specific examples of excellence were found in the Primary Standards Laboratories, the Mechanical Measurements Section, the Satellite Systems Division, and the Safety Components and Surety Components Divisions. All of these operations are commendable, and have demonstrated proactive capability to implement programs which should be emulated.

Most of the problems or concerns illustrated in this section were also found, in whole or in part, by the SNL, Albuquerque, PTTSA. The proposed actions described in the self-assessments were, in most cases, too global and broadly encompassing to provide assurance that all specific concerns of this report would be addressed. They lacked the depth of detail needed to provide that assurance. Also, the AL Self-Assessment addresses broad management issues, particularly related to guidance and oversight issues, with which this report agrees. However, the Self-Assessment scarcely mentions quality verification details, and provides no assurance that the particulars will be addressed.

Because SNL, Albuquerque, is in the process of plan development and rewriting of their total quality program, very little of the program is effectively implemented. There are areas of excellence that predate the current planning effort that do conform to management's vision of quality operations. In most instances, the SNL, Albuquerque, planning effort is considered to be a good approach. It could be improved with additional emphasis on independent verification through all levels of the organization. Management also plans to use the "cost of quality" as a measure of effectiveness. This is an accepted, but difficult, concept to measure in many instances, and management would be well advised to couple their current planning, goals, and objectives to the required program of Performance Indicators mandated in SEN-29-91 of January 11, 1991.

Similarly, AL plans to enhance its guidance and oversight capability. This planning needs to include a more specific effort directed toward quality verification to foster program success.

4.5.2.2 Findings and Concerns

QV.1 QUALITY PROGRAMS

PERFORMANCE OBJECTIVE: Administrative programs and controls should be in place to ensure policies concerning quality are administered for each facility throughout the site.

- FINDINGS:**
- Quality and ES&H program documentation is undergoing extensive revision and rewrite at SNL, Albuquerque.
 - The SNL, Albuquerque, Quality Improvement Plan consists of a hierarchy of documents, including Tier 1 "Quality Management System" of November 19, 1990; Tier 2 "Quality Management Procedures" (still in draft); and five prototypical Tier 3 documents (draft) intended to represent specific "Organization Quality Plans, Project Plans, and Procedures."
 - The Tier 1 document (policy and program description) is satisfactory. The Tier 2 document does not specifically address DOE 5700.6B and DOE 5480.19 requirements for independent verification, although they are implied; however, the document is not yet released. The prototype Tier 3 documents were not reviewed.
 - Eleven of the 17 new ES&H program documents were reviewed with deficiencies noted as follows:
 - ES&H Program, PG470116, "Quality Assurance," February 11, 1991, the Control of Measuring and Test Equipment section of the manual needs to include traceability to work in the event of "out of tolerance" conditions. This is not specified, nor is independent verification of quality activity specified.
 - ES&H Program, PG470127, "Stop Work & Restart," February 8, 1991, does not clearly indicate collection and processing of Stop Work Forms, nor does it clearly address Operational Readiness Review restarts.
 - ES&H Program, PG470015, "Construction ES&H," January 30, 1991, is weak on specifics of site monitoring activity except for monthly inspections.
 - ES&H Program, PG470140, "ES&H Information Reporting," February 5, 1991, does not address how events that are NOT reportable under DOE 5000.3A are to be documented, tracked, and reported.
 - ES&H Program, PG470118, "Packaging & Transportation," February 16, 1991, does not address requisite quality assurance (QA) plans nor provide for independent verification.

- ES&H Program, "Self-Assessment," (four individual tabs); does not specifically address QA.
- ES&H Program, PG470083, "Risk Management," April 1, 1991, does not refer to QA.
- See Concern MA.1-3 for maintenance program issues.
- This Concern was addressed in the PTTSA.

CONCERN:
(QV.1-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, quality programs fully implementing requirements of DOE 5700.6B, Sections 8 and 9, are not yet established.

FINDINGS:

- Training programs are underway for quality awareness and improvement sitewide. Not all organizations reviewed have formally documented their minimum requirements for quality training. This work is in process.
- Significant training deficiencies are documented elsewhere in this report. (See Concerns TC.1-2, TC.4-2, FS.4-2, PT.2-1, and OP.6-2.)
- This Concern was partially addressed in the PTTSA. Generic training did not address the need for quality training requirements.

CONCERN:
(QV.1-2)
(H2/C1)

Sandia National Laboratories, Albuquerque, has not defined formal quality assurance training requirements, as required by DOE 5700.6B and DOE 5480.20.

FINDINGS:

- Audit programs at SNL, Albuquerque, have been inconsistent, are frequently noncritical, and have not provided sufficient verification of the effectiveness of QA programs.
 - Audits, quality plan reviews, and quality surveys are planned and executed, but the audit plan provided does not indicate if scheduled audits were completed or not.
 - Of 37 audit reports reviewed, about half were noncritical, and few contained results of followup activity or verification of completed actions.
 - There is no formal program to use audit results to evaluate the effectiveness of the SNL, Albuquerque, QA Program.
 - A review of six Quality Program Plans, including the Research Reactors plan, specified reliance on one internal audit per year and independent audits or appraisals at 18 and 24 month intervals. The Research Reactor plan did not provide for documented surveillance actions.
- See Concerns FR.1-2, FS.3-1, PT.11-1, OA.2-2, OS.1-1, and RP.2-3.

- This Concern was addressed in the PTTSA.

CONCERN:
(QV.1-3)
(H3/C2)

The Sandia National Laboratories, Albuquerque, audits program does not meet the ASME NQA-1-1989 requirement for periodic management evaluation of the effectiveness of the Quality Assurance Program.

FINDINGS:

- AL reports 12 audits of SNL, Albuquerque, during the period February 1986 to January 1991. One of these was of the site at SNL, Livermore, and two were performed on behalf of other DOE organizations.
- All of the cited audits were of 1-3 days duration, except for one 10-day audit in December 1990.
- Three of the four audit reports reviewed were noncritical. None indicated the need or intent for prompt corrective action and/or verification.
- KAO has no one assigned to QA activity.
- AL Operations Quality Department has only five persons assigned for their Quality Verification Branch (from a 10-person Division) with two vacancies--including the Branch Chief.
- This Concern was partially addressed in the AL Self-Assessment. Shortcomings in oversight were addressed without specific reference to QA or quality verification.

CONCERN:
(QV.1-4)
(H2/C1)

The Albuquerque Operations Office is not providing sufficient independent oversight to verify quality effectiveness at Sandia National Laboratories, Albuquerque, as required by DOE 5700.6B.

QV.2**PROCUREMENT AND SUPPLIER CONTROL**

PERFORMANCE OBJECTIVE: Provisions should be established for the control of purchased material, equipment, and services; for selection and control of suppliers; and for assessing the adequacy of procurement activities.

- FINDINGS:**
- The Procurement Departments' instructions, procedures, and documentation related to ES&H and quality are undergoing revision. Process Management Teams and Quality Action Teams have been formed for this purpose. Some new procedures and documents have been completed in draft form. The entire revised program is expected to be implemented by December 1991.
 - SNL, Albuquerque, correctly perceives that too much responsibility is placed on the requisitioner for ES&H and hazard requirements identification, and action plans address this issue. It is not yet clear that revised documentation will contain sufficient provisions for independent verification of procurement activity. Existing practices do not have this provision.
 - An example of poor practice exists in the SNL, Albuquerque, procurement of inspection and test services for semiconductors from Alliance Technologies, Inc. on Basic Ordering Agreement (BOA) 03-5879. The Statement of Work required testing to specific Military Specifications. Inspection requirements were defined by generic instructions in SNL, Albuquerque, Engineering Procedure (EP)401418. ES&H requirements are listed in the "boilerplate" as nine DOE Orders. Deficiencies in this procurement are as follows:
 - The BOA did not specify if the Orders cited were AL or DOE.
 - Four of the Orders (DOE 4300.1, DOE 5000.3, DOE 5440.1C, and DOE 5820.2) were out of date by at least one revision.
 - The contractor did not know that DOE 5820.2A requires a QA program in full compliance with ASME NQA-1-1989.
 - The BOA did not cite ASME NQA-1-1989 as a requirement.
 - Neither (EP)401408 nor the Military Specifications in the Statement of Work require ASME NQA-1-1989 compliance.
 - There is no documentation verifying that the vendor QA program complies with ASME NQA-1-1989.
 - This Concern was addressed in the PT TSA.

CONCERN:
(QV.2-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, documentation of procurement activities does not provide for independent verification, as required by DOE 5700.6B.

QV.3**RECEIVING AND PREINSTALLATION INSPECTIONS**

PERFORMANCE OBJECTIVE: Provisions should be established for the inspection of purchased material, equipment, and services in accordance with documented procedures by trained personnel.

- FINDINGS:**
- Shipping and Receiving Division (Org. 3428) lacks formality in their conduct of operations. There is a generic quality plan for Operational Services Department (Org. 3420), which contains some general guidance; however, many procedures are in memorandum form or are in the process of being written.
 - Deficiencies in some Shipping and Receiving Division operations were observed and are documented elsewhere in this report. (See Concern PT.3-1.) These are traceable to lack of formal procedures and guidance.
 - The Shipping and Receiving Division protocol requires that close controls be exercised for accounting purposes but that technical inspections be performed by other Divisions, as indicated by Codes on Requisition documents. The codes are entered by requesters. Division personnel demonstrated that they are familiar with these requirements, but are not knowledgeable in the reasons for variability in receiving requirements, such as for safety or quality requirements.
 - There are no provisions for independent verification that coded inspection requirements on procurement documents are appropriate for the material received, and no cross-check points have been designed into the receiving system.
 - This Concern was partially addressed in the PT TSA. However, it referred to ES&H inspections only.

CONCERN:
(QV.3-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, has not provided guidance and formal documentation of procedures and requirements for receiving and preinstallation inspections, in accordance with the requirements of DOE 5700.6B.

QV.4 CALIBRATION PROGRAM

PERFORMANCE OBJECTIVE: Provisions should be made to ensure that tools, gauges, instruments, and other measuring and testing devices are properly identified, controlled, calibrated, and adjusted at specified intervals.

- FINDINGS:**
- Of 31 audit reports reviewed covering the past 2 years, 18 addressed calibration programs. Eight of the 18 had noted deficiencies in calibration procedures, records, marking, recall systems, or all four categories.
 - DOE/EH-0073, "Technical Safety Appraisal of the Sandia Reactors, ACRR and SPR III," May 1989, had three concerns related to calibration recall, training, and accuracy.
 - Calibration requirements are presently established and approved within the line management organization or facility without provision for independent verification to assure that requirements are correctly established. (See Concerns AX.5-1 and MA.3-4.)
 - Implementation of requirements to formally document the determination of the validity of previous inspections performed and/or the acceptability of items tested, when measuring and test equipment are found to be "out of tolerance" at calibration, is inconsistent across the site. Such requirements, defined in ASME NQA-1-1989, are frequently omitted in the quality plans reviewed.
 - This Concern was partially addressed in the PTTSA. However, it was limited to ES&H systems, and did not include performance measuring and monitoring.

CONCERN: Calibration programs are neither consistently implemented nor
(QV.4-1) effectively verified for all Sandia National Laboratories,
(H2/C2) Albuquerque, projects, programs, and facilities.

QV.5**IDENTIFICATION AND CONTROL OF HARDWARE/MATERIALS**

PERFORMANCE OBJECTIVE: Provisions should be established to identify and control the use or disposition of hardware, materials, parts, and components as well as to ensure that incorrect/defective items are not used.

- FINDINGS:**
- Only the Safety Components and Surety Components Divisions (Orgs. 2543 and 2545) have a clearly delineated and documented safety-related parts program. The program is employed by the related subsystems and systems level divisions who use the parts.
 - The Satellite Systems Department exercises close control over all components, but their program is based on critical technical parameters rather than safety-related characteristics.
 - Some programs; e.g., Research Reactors, provide descriptions of quality levels related to safety in their quality program plans, but do not describe or define how the ratings are to be used with respect to safety-related parts and systems.
 - As a rule, SNL, Albuquerque, divisions are responsible for controlling their own safety-related parts and materials, using their own internal procedures or documents, with no provision for sitewide standards or independent verification. (See Concern MA.3-2.)
 - This Concern was not addressed in the PTTSA. It did address the larger issue of quality planning, but the subset represented by this Concern also needs management's attention.

CONCERN:
(QV.5-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, policies and programs do not address the identification, control, use, and/or disposition of hardware, materials, parts, and components, as required by DOE 5700.6B.

QV.6**INSPECTIONS**

PERFORMANCE OBJECTIVE: Prerequisites should be provided in written inspection procedures with provisions for documenting and evaluating inspection results.

- FINDINGS:**
- The scope of inspection programs are not consistently described, documented, and implemented across the site. Some inspections programs are excellent and have model programs, such as Satellite Systems Division and Mechanical Measurements Section. Other areas do not consider such inspection programs to be applicable to their activity.
 - There is no definitive guidance as to requirements for inspection programs, and no provisions for independent verification that programs are established satisfactorily. Divisions are permitted to make autonomous decisions as to the scope and content of their own programs independent of reviews outside their specific area, except for infrequent external reviews. Such reviews sampled tend to be non-critical. (See Concerns AX.5-1 and AX.8-1.)
 - This Concern was partially addressed in the PT TSA. It addressed ES&H inspections only and should include performance based inspection.

CONCERN:
(QV.6-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, has not established a program to ensure inspections meet the requirements of DOE 5700.6B.

QV.7 CONTROL OF SPECIAL PROCESSES

PERFORMANCE OBJECTIVE: Provisions should be established to ensure the acceptability of special processes such as welding, heat treating, nondestructive testing, and chemical cleaning, and that special processes are performed by qualified personnel using qualified procedures and equipment.

- FINDINGS:**
- Nondestructive Test (NDT) laboratories, welding shops, and other special process activities are engaged in development work, and do not operate to controlled procedures.
 - The Level III Welding Inspector has no current certification. He is in the process of being certified.
 - The NDT laboratory staff has prepared a division procedure for certification which conforms to the requirements of American Society for Non-destructive Testing Recommended Practice No. SNT-TC-1A. It has been approved only within the division.
 - Quality program plans reviewed do not satisfactorily identify needs or requirements for special process controls.
 - This Concern was addressed in the PT TSA.

CONCERN: Requirements for the control of special processes and the means for verifying their implementation are not established at Sandia National Laboratories, Albuquerque, as required by ASME NQA-1-1989.
(QV.7-1)
(H2/C2)

4.5.3 Operations

4.5.3.1 Overview

The appraisal of SNL, Albuquerque, operational safety practices encompassed 19 facilities, which were chosen because of their contribution to the fulfillment of the SNL, Albuquerque, mission as well as their size, complexity, and hazard potential. These facilities include the Steam Plant, Bldg. 605; the Radiant Heat Facility, Bldgs. 6536 and 6538; the Centrifuge Facilities, Bldgs. 6523, 6523B and 6526; the Experimental Aerodynamics Laboratory, Bldg. 865; the Microelectronics Development Laboratory (MDL), Bldg. 858; the Neutron Generator Test Facility, Bldg. 935; the High Pressure Gas Gun Facility, Bldg. 922; the Accelerator & High Pressure Gas Gun Facility, Bldg. 808; the Melting Research & Solder Processing Facility, Bldg. 6630; the Light Initiated High Explosive Facility, Bldg. 6715; the National Solar Thermal Test Facility, Bldgs. 9980, 9981, 9981A, 9984; the Particle Beam Fusion Accelerator II (PBFA II) Facility, Bldg. 983; the Simulation Technology Area, Bldg. 970; the Annular Core Research Reactor (ACRR), Bldg. 6588; the Gamma Irradiation Facility (GIF), Bldg. 6588; the Hot Cell Facility, Bldg. 6580; the Sandia Pulse Reactor (SPR) facility, Bldg. 6590; the Rocket Sled Track Facility/Control Center, Bldg. 6741; and AL.

This appraisal addressed all eight performance objectives of the Operations technical area. Management and staff were interviewed to ascertain how operations were conducted and controlled. The facilities were inspected; log books, records, and procedures were examined; and policy and practices were reviewed. Wherever possible, actual facility operations were monitored; however, there were many facilities that were between activities.

Operations at SNL, Albuquerque, can be divided into three groups: research, development, and support operations. The groups are further divided by discipline, i.e., Technical Support, Research, Component Development, Defense Programs, and Exploratory Systems, each managed by a Vice President reporting to an Executive Vice President or directly to the President.

Operations are conducted in an informal but professional manner. The operators were attentive, responsible, and displayed a sense of ownership for the processes and equipment they were operating. The SNL, Albuquerque, personnel, at all levels of the organization, displayed enthusiasm for their work and for improving the operation of their facilities.

The lack of sitewide policies governing operations has resulted in a unique approach to operational safety by most of the facilities. This lack of guidance precipitated a number of concerns relative to the definition and delegation of authority, and the use and control of procedures.

- The operating organization's structure is generally not well defined, and the responsibilities and authorities of each manager, supervisor, and operator are not explicitly stated.
- There are varying degrees of formality in operating instructions, logkeeping, configuration control, records, training, tagout, appraisals, safety requirements, and communication.
- There were many inconsistencies regarding housekeeping, coding conventions (color, size, shape) and labeling conventions within the facilities.

The lack of uniform operating procedures, formal training curricula, and testing to assure satisfactory performance standards, could severely impact operations if attrition of current operators were to occur. Such a risk appears unacceptable in view of the unique and irreplaceable facilities at SNL, Albuquerque. The team observed that not all operators were knowledgeable about the support systems for their facilities, and did not fully understand the impact of status changes on the equipment they operate.

SNL, Albuquerque, has not been successful in implementing a lockout/tagout program. Many facilities have site-specific lockout/tagout procedures; however, the degree of formality and control associated with the implementation of these procedures varies significantly.

The formality of operations at SNL, Albuquerque, varied greatly between facilities. Operations were generally conducted in an informal but professional manner by an experienced staff. However, most programs that support operations lacked formality and discipline, and were not in compliance with DOE requirements. SNL, Albuquerque, has developed a Conduct of Operations Program and an implementation plan which have been approved by Defense Programs, Headquarters, DOE, but have not been formally released by AL for implementation. If diligently pursued and successfully implemented, this program should rectify many of the concerns expressed in this appraisal.

The PTTSA performed in the operations area captured the majority of those programmatic areas needing the attention of management. Those activities associated with the actual conduct of operations were not addressed in sufficient detail.

4.5.3.2 Findings and Concerns

OP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Operations organization and administration should ensure effective implementation and control of operations activities.

- FINDINGS:**
- Operations oriented goals and performance indicators were not specified for any facility visited.
 - A policy and implementing procedures addressing the establishment of operations oriented goals and performance indicators does not exist.
 - This Concern was not addressed in the PTTSA.

CONCERN:
(OP.1-1)
(H3/C1)
Measurable goals and performance indicators are not used at facilities to effectively improve performance and safe operations, as required by DOE 5480.19. (See Concerns OA.3-1 and OA.5-1.)

- FINDINGS:**
- The SNL, Albuquerque, Organization Chart identifies the President, Vice President, and Directors, and the organizational structure associated with these positions. Below the Director level, the practice is to use the SNL, Albuquerque, telephone directory for organizational information.
 - Some facilities have organization charts; however, most organization charts are not formally authorized, controlled, or approved.
 - A formal document establishing the requirements for the development, format, approval, and control of organization charts does not exist.
 - Operations organization charts for several facilities did not clearly delineate lines of authority.
 - This Concern was addressed in the PTTSA.

CONCERN:
(OP.1-2)
(H3/C2)
Sandia National Laboratories, Albuquerque, has not implemented a policy and set of requirements that provide a clear delineation of the lines of authority and responsibilities for the facility operating organizations. (See Concern TS.1-2.)

- FINDINGS:**
- The responsibilities and authorities of each position within the facility operating organizations are promulgated in an informal and primarily verbal manner at most facilities.
 - The responsibilities and authorities of the operations staff are defined for those positions held by SNL, Albuquerque, union members or contractor personnel. However, the responsibilities and authorities of the operations staff

positions that are filled by SNL, Albuquerque, non-union personnel are not defined for most facilities.

- This Concern was addressed in the PT TSA.

CONCERN:
(OP.1-3)
(H2/C1)

The responsibilities and authorities of each facility operations position are neither defined nor documented for most facilities, as required by DOE 5480.19. (See Concerns OA.1-4 and MA.1-2.)

FINDINGS:

- Most facilities visited did not have a policy and procedures addressing a required reading program for the facility operations staff.
- The formality of the process for required reading varied significantly from one facility to another.
- At most facilities, the required reading was directed to ES&H policy. At the facilities, operating policy and lessons learned; i.e., industry and SNL operating experience and other work related information, were not included in most required reading lists.
- This Concern was partially addressed in the PT TSA.

CONCERN:
(OP.1-4)
(H3/C1)

Sandia National Laboratories, Albuquerque, does not have a policy that defines the requirements for an effective, required reading program, as defined in DOE 5480.19.

OP.2 CONDUCT OF OPERATIONS

PERFORMANCE OBJECTIVE: Operational activities should be conducted in a manner that achieves safe and reliable operation.

- FINDINGS:**
- Most logs were maintained in loose leaf notebooks and many were filled out in pencil.
 - Practices are inconsistent from one facility to another regarding the format and control of logbooks.
 - Logbooks were not consistently initialed by supervisors to indicate their review and understanding of logbook entries.
 - Log entries are not usually explicit enough to permit reconstruction of the facility status at a given time.
 - Logkeeping is usually informal; content varies and is often at the discretion of the operator.
 - This Concern was addressed in the PTTSA.

CONCERN:
(OP.2-2)
(H3/C1)

Sandia National Laboratories, Albuquerque, has neither a policy nor procedures establishing the requirements for facility operations logs, as required by DOE 5480.19.

OP.3

OPERATIONS PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Approved written procedures, procedure policies, and data sheets should provide effective guidance for normal and abnormal operation of each facility on a site.

- FINDINGS:**
- Numerous electrical panels' schedules (labels) had handwritten entries and crossouts, most of which were not dated or signed.
 - Numerous electrical panels' schedules (labels) have not been updated for a period ranging from 4 to 20 years.
 - Most facilities had no "as-built" drawings readily available to the operations staff. Those facilities that had drawings available did not have drawings that were identified and marked as controlled documents, and many were acknowledged by the staff as not reflecting the current configuration of the facility.
 - Many facilities did not have a procedure governing the development, approval, use, control, and revision of procedures.
 - Most operating procedures and checklists were not keyed to the facility and equipment to which they were applicable, and the effective date and revision numbers were not indicated.
 - Centrifuge Safety Checklist B61 and Centrifuge Fixture Checklist B83 completed on March 9, 1991, did not have all of the required signatures, and the required console light checks were not performed.
 - Configuration control was lacking in Technical Area III. A controlled copy of SOP# 053008902, "Safe Operating Procedures for Test Operations on the Area III Centrifuge," undated, was not available at the facility. The checklist in use was from an earlier revision of the Safe Operating Procedures.
 - Configuration control was found deficient at PBFA II. The controlled copy of "Dive-Operate OPPRO, Rev. A," July 11, 1990, "PBFA II Operating Procedure," located on the PBFA II tank platform included a handwritten revision. The controlled copy of the same procedure retained in the facility library had not been revised.
 - This Concern was addressed in the PTTSA.

CONCERN:
(OP.3-8)
(H2/C1)

Sandia National Laboratories, Albuquerque, has not established an effective configuration control system addressing procedures, drawings, manuals, and the physical plant to ensure safe facility operation, as required by DOE 5480.19. (See Concerns TS.2-1 and OA.7-2.)

FINDINGS:

- A policy governing the use of operating procedures has not been implemented. Formality of operating procedures varies significantly from one facility to another. Many facilities do not have a specific policy for operating procedures.
- A formal methodology for verifying, validating, controlling, and implementing operating procedures was not available at most facilities.
- Some operating facilities include Operating Procedures in the Safe Operating Procedures while other facilities divide the Operating Procedures and Safe Operating Procedures into separate documents, leading to inconsistency in their use. Some operating facilities did not have Operating Procedures.
- Most checklists did not indicate the range of acceptable conditions being verified. For example, when a compressed air system was required to be operating, the acceptable range of system air pressure was not specified.
- Generally, where checklists are used there is no generic or site-specific policy or procedure that defines their format, control, use, and review.
- This Concern was addressed in the PTTSA.

CONCERN:
(OP.3-9)
(H2/C1)

Sandia National Laboratories, Albuquerque, has not implemented a formal methodology for development, approval, and control of operating procedures at most facilities, as required by DOE 5480.19. (See Concerns MA.8-1 and TS.2-1.)

FINDINGS:

- There are no procedures at most facilities that govern the development, use, and control of operator aides.
- In Bldg. 9990, "Post-its" were used on instrument panels for operator aides and notes.
- Handwritten notes conveying operations-related information were evident on control panels and electrical breakers in several facilities.
- This Concern was addressed by the PTTSA.

CONCERN:
(OP.3-10)
(H3/C1)

Sandia National Laboratories, Albuquerque, does not have a policy that defines the use and control of operator aides, as required by DOE 5480.19.

OP.4

FACILITY STATUS CONTROLS

PERFORMANCE OBJECTIVE: Operations personnel should know the status of the systems and equipment under their control, and should know the effect of nonoperational systems and equipment on continued operations. They should ensure that systems and equipment are controlled in a manner that supports safe and reliable operation.

- FINDINGS:**
- Out-of-service tags attached to diesel fuel tanks adjacent to Bldg. 605 were not uniquely identified; i.e., not signed, dated, controlled by number, or recorded in a log.
 - The status of a rack of electronic equipment, removed from service for repairs in Bldg. 893, was noted on a piece of paper attached to the rack with tape. The note indicated a part had been ordered; however, it did not contain a signature, date, or control number.
 - A hoist in Bldg. 6538, that was removed from service for safety reasons, had an orange tag taped to the control with a statement of the deficiency, signature, date, and two numbers, either of which could have been a control number. The statement of condition could not be understood by members of the team or escorts. The facility owners and escorts could not explain the numbers on the tag and did not know if there was a control log. The hoist control had not been de-energized.
 - A recorder in Bldg. 6741, Sled Track Control Room, was identified as out-of-service by provision of a handwritten note on a piece of yellow tape affixed to the equipment.
 - A "DANGER DO NOT OPERATE" tag affixed to a sandblasting unit, located in a shed adjacent to Bldg. 6536, was not signed, dated, nor did it specify the danger that was associated with the absence of a pneumatic relief valve which had been removed for calibration.
 - The Velocity Interferometer System for Any Reflector located in Bldg. 808 was identified as out-of-service by provision of a computer generated sign on a piece of 8-1/2" x 11" paper. The sign was not numbered, signed, or dated. The equipment status and sign posting were not entered in a log.
 - Procedures do not exist that address the removal of defective equipment from service and the subsequent tagging of the equipment.
 - This Concern was addressed in the PT TSA.

CONCERN:
(OP.4-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, does not have a program that effectively controls the identification, tagging, and logging of equipment, which has been removed from service, as required by DOE 5480.19.

FINDINGS:

- DOE 5480.19, Chapter IX, specifies that "The lockout device is under the exclusive control of the authorized personnel performing servicing of maintenance." The Bldg. 922 procedure for lockout/tagout requires the supervisor to maintain control of the lock and key even though another employee may be performing the work.
- A yellow tape with "Lock Out" handwritten on it was placed over a breaker in an electrical panel in Bldg. 922.
- Several facilities did not have a lockout/tagout procedure.
- In Bldg. 922, a plastic tie wrap was used instead of a lock to secure the chain on a continuous chain hoist, which had a lockout tag affixed.
- Bldg. 6536 does not have lockout/tagout procedure applicable to other than electrical systems.
- The lockout/tagout process used at the Sandia Accelerator and Beam Research Equipment facility in Bldg. 970 does not require that a lockout/tagout log be used.
- This Concern was addressed in the PT TSA.

**CONCERN:
(OP.4-2)
(H1/C1)**

Sandia National Laboratories, Albuquerque, has not implemented a lockout/tagout program consistent with the requirements of DOE 5480.19, DOE 5483.1A, and Code of Federal Regulations 29 CFR 1910.147. (See Sections MA.2 and OS.2.)

FINDINGS:

- There were some supervisors who were not familiar with DOE 5000.3A and did not know who the Facility Manager was, as defined in DOE 5000.3A.
- The Occurrence Reporting Handbook for DOE 5000.3A was distributed April 30, 1991. The date on which the handbook was to be effective was not stated. The transmitting documents requested the old handbook be returned and stated that "This is a draft which should be considered a working document." In essence, the handbook was in effect upon receipt.
 - Most Facility Managers did not know beforehand that the document was being sent.
 - Training related to the requirements of the new handbook had not been completed prior to its implementation.
 - The facilities procedures affected by the handbook had not been reviewed and revised to reflect the new requirements of the handbook.
- These Concerns were addressed in the PT TSA.

**CONCERN:
(OP.4-3)
(H2/C1)**

Sandia National Laboratories, Albuquerque, has not established a system to assure that appropriate changes are made to affected operating documents prior to the required implementation date of new or revised policies, practices, and Department of Energy Orders.

**CONCERN:
(OP.4-4)
(H2/C1)**

Sandia National Laboratories, Albuquerque, has not established a policy and set of implementing procedures that ensure the staff of an operating facility is trained in new procedures, manuals, and requirements prior to their implementation, as required by DOE 5480.19.

OP.5 OPERATIONS STATIONS AND EQUIPMENT

PERFORMANCE OBJECTIVE: Operation stations and facility equipment should effectively support facility operation.

- FINDINGS:**
- The laser area of Bldg. 893 was cluttered, floors were littered, and material and equipment were stored in a disorderly fashion.
 - The storage pit in Bldg. 6536 was dirty and littered.
 - The valve pit north of Bldg. 605 contained waste paper and other trash.
 - The roof of the Chemistry Room in Bldg. 605 was dirty and littered with nails and screws.
 - Trash was noted under the gratings in the basement of Bldg. 6526; in addition, tools and parts were stored on equipment.
 - There were nuts, bolts, pieces of wire, dirt, and washers on the floor in the pit under the Hypersonic Wind Tunnel in Bldg. 865.
 - The Medium Bay Machine Shop in Bldg. 970 was littered; machining turnings were strewn over equipment and the floor.
 - The plexiglass under the grating over the PBFA II tank in Bldg. 983 was covered with dirt and debris.
 - Dirt and debris were evident in the pit and around the hydraulic pump adjacent to the GIF in Bldg. 6588.
 - The sled track control console located in Bldg. 6741 was cluttered with scissors, tape, public telephone books, computer disks, gloves, and rubberbands.
 - Despite the above observations, most areas visited were in general quite clean. Those areas of facilities "off the beaten path" such as utility rooms and store rooms were often dirty and cluttered.
 - This Concern was addressed in the PT TSA.

CONCERN: The housekeeping in some areas detracts from facility safety, and
(OP.5-1) is not in accordance with DOE 5483.1A, DOE 5480.19,
(H2/C1) 29 CFR 1910.22, and generally accepted industrial practice. (See
 Concerns MA.2-3 and WS.4-1.)

OP.6 OPERATOR KNOWLEDGE AND PERFORMANCE

PERFORMANCE OBJECTIVE: Operator knowledge and performance should support safe and reliable operation of the equipment and systems for which they are responsible.

- FINDINGS:**
- Most facilities do not post the current facility status at a central location.
 - The acceptable operating states (operating, shutdown, standby) of facilities and the condition of supporting equipment and components have not been defined.
 - Policies and procedures defining controls for determining facility status did not exist.
 - This Concern was not addressed in the PT TSA.

CONCERN:
(OP.6-1)
(H3/C2)

Management has not established standards and directives providing a clear concise definition of acceptable operating modes (operating, shutdown, standby, etc.) for facilities and experiments consistent with generally accepted industrial practices.

- FINDINGS:**
- Most instructors and trainers for job-specific training have had no instructor training.
 - Most facilities have not established specific qualification requirements for all job tasks. Therefore, there are no standards from which to develop training plans and performance measurements.
 - Most facilities do not have a training policy and procedures that define the requirements for initial and ongoing training programs.
 - This Concern was addressed in the PT TSA.

CONCERN:
(OP.6-2)
(H3/C1)

Sandia National Laboratories, Albuquerque, has not established policies and procedures to ensure that job-specific training, retraining, and certification is performed by qualified instructors, and that training and qualification plans are formally documented, as required by DOE 5480.19. (See Concerns TC.1-2 and QV.1-2.)

OP.7**SHIFT TURNOVER**

PERFORMANCE OBJECTIVE: Turnovers conducted for each shift station should ensure the effective and accurate transfer of information between shift personnel.

- FINDINGS:**
- The only multishift facility operations observed by the team at SNL, Albuquerque, were in Bldg. 605, Steam Plant.
 - The Steam Plant shift turnover was not guided by a checklist or similar document which ensured all key plant conditions and systems were addressed. A general discussion between the oncoming and offgoing shift personnel was used to transfer significant information regarding the steam plant status.
 - The Steam Plant shift log was not read by the members of the oncoming shift prior to relieving the offgoing shift.
 - This Concern was addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, has not implemented an effective operations shift change policy and set of procedures, in accordance with DOE 5480.19.
(OP.7-1)
(H3/C1)

OP.8**HUMAN FACTORS**

PERFORMANCE OBJECTIVE: Human factors considerations should be incorporated in the design, layout, and operation of all facilities on the site to facilitate operator control, information processing, and the recognition and proper response to alarms, instruments, and other equipment.

- FINDINGS:**
- Normal range of the Deaerating Feed Tank level is indicated by penciled markings on the insulation adjacent to the glass standpipe.
 - None of the switches in the "Steam Plant Control West" lighting panel were labeled.
 - The Bldg. 6526, Centrifuge Facility, 208V Panel D, electrical panel is not labeled.
 - The information placard on the door of Bldg. 6523B does not identify the high pressure hazard that exists inside the building when the hydraulic system pumps are operating.
 - Nitrogen gas lines on the face of hot cells in the Hot Cell facility are not labeled.
 - In Bldg. 865, the Wind Tunnel facility, two valve controls located on the Mach 5 Control Panel were labeled with paper signs; one of which was faded such that the inscription was not legible from a distance of 4 feet.
 - A switch on the Mach 5 Control Panel was labeled using tape inscribed with "alarm," "on," and "off."
 - Paper tags were used to identify components in three facilities.
 - The intensity of some control room video monitors was so low it was difficult to read the display from a distance of 3 feet.
 - Color coding conventions for alarms and controls were not consistent within or between facilities.
 - Conventions regarding the shape of safety-related controls having similar functions were not consistent within or between facilities.
 - This Concern was addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, has not developed and implemented coding conventions (color, size, shape) and labeling conventions for facility systems, components, and equipment consistent with American National Standards Institute (ANSI) 13.1Z and generally accepted industrial practice.
(OP.8-1)
(H2/C2)

FINDINGS:

- Within the Control Room for the Steam Plant, Bldg. 605, parameters identified as critical to the operation of the Steam Plant and the MDL, Bldg. 858, are monitored on a control panel. The Control Room is not always monitored by an operator because of ancillary duties assigned to the operator and staffing limitations.
- There are no audible or visual alarms outside the Control Room to alert the operating staff to abnormal conditions indicated on the control panel during those periods the Control Room is not occupied.
- This Concern was not addressed in the PTTSA.

CONCERN: The current shift routine of the steam plant has not been considered in the design of the control panel monitoring the Microelectronics Development Laboratory and the Steam Plant.
(OP.8-2)
(H2/C2)

4.5.4 Maintenance

4.5.4.1 Overview

The appraisal of maintenance at SNL, Albuquerque, addressed all eight of the performance objectives. Material for the appraisal was obtained from interviews with maintenance and operational managers, supervisors, and craftspersons. In addition, information was gained by a review of maintenance and programmatic policy and procedural documentation and by extensive field reviews of real property, facility equipment, and programmatic experimental systems and test equipment. The primary buildings visited and inspected included: Bldgs. T-20, 605, 840, 863, 864, 865, 870, 887, 915, 922, 954, 961, 983, 6501, 6502, 6570, 6536, 6580, 6586, 6587, 6588, 6590, 6720, and 9990. At many of these buildings, supporting utility buildings, yards, and storage sheds were also inspected.

SNL, Albuquerque, does not have a clearly stated maintenance policy for real property or for programmatic property, as required by the newly issued DOE Order on maintenance, DOE 4330.4A, "Maintenance Management Program," October 17, 1990. The Facilities Operations and Maintenance Department is aggressively pursuing a program to bring their activities into compliance with the DOE Order; however, it is a significant task and will require several years to complete. The upgrading of the programmatic maintenance programs to the requirements of DOE 4330.4A is a much more formidable task, since organizations of this sort do not traditionally conduct their maintenance activities with a great deal of formality. In addition, the programmatic organizations are much less familiar with DOE 4330.4A and have not prepared plans or established goals to achieve compliance.

The status of SNL, Albuquerque, real property, from the standpoint of maintenance, was generally satisfactory; however, there were several notable instances of poor maintenance practices. The low-voltage electrical systems showed many instances of code violations, poor workmanship, defective equipment, and generally poor upkeep. In addition, the preventive maintenance program for cranes and hoists is seriously behind schedule with many cranes locked out due to defects including frayed cables, faulty brakes, and spread hooks. Instances were noted where there were substantial delays in responding to maintenance requests, and housekeeping, particularly at the small outlying facilities, was generally poor with many instances of loose or missing fasteners, missing lights, leakage, and general lack of attention to maintenance. The source of many of the problems of this sort appears to be a general feeling of lack of ownership or responsibility on the part of management, supervision, and craftspersons.

The Automated Maintenance Management System is effective in scheduling, tracking, and controlling facility maintenance activities; however, the system is not supported by adequate planning. The procedures used in the field are generally extremely brief, serving primarily as a scheduling mechanism rather than a means of providing instructions and work documentation, as required by DOE 4330.4A.

The maintenance of programmatic equipment ranged from very good to marginal. At the larger facilities, such as the reactor and accelerator facilities, the maintenance program and procedures were very good with substantial progress

being made toward compliance with DOE 4330.4A. At other facilities, particularly the small outlying facilities, maintenance programs and procedures for programmatic equipment were generally poor or, in some cases, nonexistent. In many instances procedures were handwritten with no evident method for approval, control, or revision. In addition, these areas generally illustrated poor housekeeping and inattention in minor maintenance items.

Predictive maintenance procedures are used in some instances; however, they are not widely used to trend, establish causal factors, or to anticipate equipment problems. In addition, maintenance procedures were not prepared, controlled, or disposed of in the manner required by DOE 1324.2.

Essentially, all of the concerns generated in this appraisal were included in the PTTSA as primary concerns, or were included in the discussions supporting the concerns. Significant concerns that were not included related to: control of materials and spares, maintenance of low-voltage electrical systems, and control of records.

In summary, SNL, Albuquerque, does not have a well documented maintenance program, and faces a significant task in bringing maintenance activities for real property and programmatic equipment into compliance with the new DOE 4330.4A on maintenance. This is particularly so with respect to programmatic equipment, since this will involve a "cultural" change. The maintenance of real property is being done in an acceptable manner with exception of the areas mentioned above, including procedures, electrical systems, cranes and hoists, housekeeping, and backlog of work. Programmatic equipment receives maintenance, but it is done with much less rigor, resulting in poor visibility and, to some extent, less assurance of safe operations and efficiency.

4.5.4.2 Findings and Concerns

MA.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Maintenance organization and administration should ensure effective implementation and control of maintenance activities.

- FINDINGS:**
- SNL, Albuquerque, has no clearly stated Corporate maintenance policy.
 - The Facilities Maintenance and Operations Department has been active in developing a Plant Maintenance Program, as required by DOE 4330.4A; however, the plan is not complete and has not been fully implemented.
 - The maintenance program for real property, consisting of buildings and grounds, is not fully developed.
 - There is no well defined maintenance program for programmatic equipment, including laboratory research and development equipment.
 - Programmatic organizations, except for the larger organizations, are not familiar with the requirements of DOE 4330.4A regarding the conduct of maintenance, and are not aware of how this Order applies to them and to their equipment.
 - The Facilities Maintenance and Operations Department has formulated a plan and schedule to bring their operations into compliance with DOE 4330.4A. No such plan has been developed for the programmatic organizations and their equipment. The Facilities Maintenance and Operations Department has been charged with the responsibility to initiate the development of this plan.
 - This Concern was addressed in the PTSA.

CONCERN: Sandia National Laboratories, Albuquerque, lacks a consistent formal maintenance program for both real and programmatic property, and is not in compliance with DOE 4330.4A in this regard. In the case of programmatic property, plans and goals have not been prepared to achieve compliance with DOE 4330.4A.

(MA.1-1)
(H2/C1)

- FINDINGS:**
- Because of the lack of a formal SNL, Albuquerque, policy on maintenance, several problems have resulted, including:
 - The organizational structure and related responsibilities for maintenance are not clearly defined.
 - Maintenance procedures are in an interim stage. Upgrading of some procedures is essentially complete, while work on others has not started.

- In some instances, the absence of an overall policy has resulted in inconsistency in the format and content of maintenance procedures.

- See Concerns OP.1-3, OA.1-4, and TS.1-2.
- This Concern was addressed in the PT TSA.

CONCERN:
(MA.1-2)
(H2/C1)

The Sandia National Laboratories, Albuquerque, maintenance organizational structure and the related responsibilities, authorities, and procedural methods are not defined, as required by DOE 4330.4A.

FINDINGS:

- A key element in implementing the graded approach to maintenance in accordance with the requirements of DOE 4330.4A, is a clear identification of systems critical to safety in major facilities. In most cases these systems have not been identified. This is true for programmatic systems as well as real property.
- Since critical systems have not been identified, maintenance on these systems is not necessarily properly prioritized.
- This Concern was addressed in the PT TSA.

CONCERN:
(MA.1-3)
(H2/C1)

The Facilities Maintenance and Operations Department and programmatic organizations have not applied a graded approach to their maintenance activities, as required by DOE 4330.4A.

FINDINGS:

- Resources have not been allocated to enable Facilities Maintenance and Operations to proceed to a position of full compliance with DOE 4330.4A in the planned timeframe.
- Plant maintenance is currently performed on a basis of "fix it when it breaks."
- Regular calls to conduct emergency-type repairs seriously impact the ongoing preventive maintenance program.
- Instances were noted where there were substantial delays (up to 12 months) in responding to maintenance requests.
- The following Concerns were addressed in the PT TSA.

CONCERN:
(MA.1-4)
(H2/C1)

Resources have not been allocated to enable the Facilities Maintenance and Operations Department to implement the requirements of DOE 4330.4A in a timely manner.

CONCERN:
(MA.1-5)
(H2/C2)

The maintenance work backlog is excessive.

MA.2 CONDUCT OF MAINTENANCE

PERFORMANCE OBJECTIVE: Maintenance should be conducted in a safe and effective manner to support each facility condition and operation on the site.

- FINDINGS:**
- Maintenance work is generally properly authorized and controlled; however, in some instances work stoppages due to wrong craft assignments or errors in materials requirements have occurred.
 - This Concern was addressed in the PT TSA.

CONCERN: See Concern MA.4-1.

- FINDINGS:**
- The Maintenance Warehouses do not, in all cases, ensure segregation of materials and control of equipment spares. (See Section 4.5.4, MA.3.)
 - This Concern was not addressed in the PT TSA.

CONCERN: See Concern MA.3-2.

- FINDINGS:**
- Maintenance managers do not, in all cases, take an active role in minimizing hazards to employees as noted by the persisting problems with defective cranes and hoists (see Concern MA.6-2), and the numerous electrical problems which have been noted in Section 4.5.4, MA.5 and Concern MA.5-2.
 - See Concerns WS.4-5, MA.4-2, and MA.6-2.
 - This Concern was not addressed in the PT TSA.

CONCERN: Not all maintenance managers and supervisors take an active role in minimizing the exposure of personnel to hazardous conditions, as required by DOE 4330.4A.
(MA.2-1)
(H1/C1)

- FINDINGS:**
- Low-voltage lock and tag procedures are used at SNL, Albuquerque, facilities; however, they are not done in a standardized or well-documented manner, and, in some instances, lack some of the steps required by DOE 5480.19 or 29 CFR 1910.147.
 - An instance was noted where a "redtag" on a crane was ignored. (See Concern WS.4-5.)
 - Currently, many cranes and hoists are red-tagged for safety deficiencies. Many instances were noted where managers and supervisors of the user organizations were insistent about restoring service on an interim basis, indicating an indifferent attitude toward safety issues.
 - See Concerns OP.4-1, OP.4-2 and OS.2-5.
 - This Concern was addressed in the PT TSA.

CONCERN: See Concern OP.4-2.

- FINDINGS:**
- Good maintenance practices are not used in all cases as indicated by:
 - Systems not properly protected against the environment, including junction boxes, cable trays, and instrument lines. (See Section 4.5.4, MA.5.)
 - Defective tools including arc-damaged hand tools and instances of defective cords on electrical hand tools.
 - Numerous disorderly work sites. (See Section 4.5.4, MA.5.)
 - Substandard workmanship. (See Section 4.5.4, MA.5.)
 - Maintenance personnel do not, in all cases, exhibit a strong feeling of ownership with respect to their job assignment and the related equipment. The tendency is to fix only what is required by the work request. Other simple maintenance items such as missing lights, loose fasteners, and dirt or liquids on the floor do not get corrected or reported.
 - See Concerns OP.5-1, WS. 4-1, and WS.4-8.
 - This Concern was addressed in the PTTSA.

CONCERN: Maintenance practices do not ensure that maintenance areas are kept in an orderly, clean, and safe condition, as required by 29 CFR 1910.141.
(MA.2-2)
(H2/C1)

- FINDINGS:**
- The majority of maintenance supervisors are strongly oriented toward mechanical systems and are less familiar with electrical equipment and circuitry.
 - As noted in Sections 4.5.4, MA.5 and MA.6, electrical problems are the most serious maintenance related issue at SNL, Albuquerque.
 - Craftsmen, primarily electricians, do not feel that they get satisfactory supplemental training particularly on new equipment or in the event they are assigned to a new facility.
 - See Concern WS.4-9.
 - This Concern was addressed in the PTTSA.

CONCERN: There is a lack of emphasis on training and qualification of electrical craftspersons and mechanical supervisors supervising electrical crafts.
(MA.2-3)
(H1/C2)

MA.3 MAINTENANCE FACILITIES EQUIPMENT AND MATERIAL

PERFORMANCE OBJECTIVE: Facilities, equipment, and material should effectively support the performance of maintenance activities.

- FINDINGS:**
- The major portion of maintenance materials and spare parts is stored at the Maintenance Warehouse (Bldg. 954); however, much equipment is also stored in small satellite warehouses in the outlying facility areas. This has resulted in excessive duplication of spares and significant problems in the control, inspection, and in maintenance of material standards.
 - Used parts are stored in the Maintenance Warehouses for use in instances where new parts are no longer available. There is no formal method to determine the condition and performance of these used parts prior to reuse. Many of these parts are electrical switches, breakers, and disconnects.
 - Surplus materials are stored outdoors in unfenced and uncontrolled areas. In some cases, the areas have been used for the unauthorized disposal of hazardous materials.
 - At several of the outlying facilities, numerous small buildings are used for parts storage under substandard conditions including poor lighting, mixed bin storage of parts, used parts mixed with new parts, stainless steel stored with carbon steel, and improper storage cabinets.
 - See Concern QV. 5-1.
 - This Concern was not addressed in the PTTSA.

CONCERN: The maintenance warehouse system does not ensure control, protection, or segregation of materials and spare parts, in accordance with 29 CFR 1910.176.
(MA.3-2)
(H2/C1)

- FINDINGS:**
- The Facility Modifications Division has a documented system to periodically inspect and load test lifting, hoisting, and rigging equipment. Some slings are sent in by programmatic organizations and are tested; however, the majority of the slings in the field are not identified, tested, or inspected in any manner.
 - The Facility Modifications Division has essentially no involvement in the procurement or usage of lifting, hoisting, and rigging equipment by the programmatic organizations.
 - See Concerns OS.2-2 and WS.4-5.
 - This Concern was addressed in the PTTSA.

CONCERN: The requirements of 29 CFR 1910.184, are not being met at Sandia
(MA.3-3) National Laboratories, Albuquerque, in that uncertified lifting,
(H1/C1) hoisting, and rigging equipment are employed.

FINDINGS:

- There is generally no indication on the face of an instrument clearly relating to its calibration requirement or status.
- There is no uniform documented and enforced policy describing requirements and methods for calibration of instruments.
- Instruments are calibrated by the user, by subcontractors, and by the SNL, Albuquerque, calibration facility. In some instances, calibrations are done in place. In other instances, the instrument is removed and replaced.
- See Concern QV.4-1.
- This Concern was addressed in the PT TSA.

CONCERN: There is no system that ensures all instruments requiring
(MA.3-4) calibration have been identified and their calibration
(H2/C1) maintained, as required by DOE 4330.4A.

MA.4 PLANNING, SCHEDULING AND WORK CONTROL

PERFORMANCE OBJECTIVE: The planning, scheduling, and control of work should ensure that identified maintenance actions are properly completed in a safe, timely, and effective manner.

- FINDINGS:**
- The maintenance activities for real property and the associated support equipment are planned and scheduled using the computerized Automated Maintenance Management System; however, instances were noted where field jobs were terminated or were improperly staffed or supplied because of planning deficiencies. Other instances were noted where the absence of planning resulted in a lack of control over work order time and materials expenditures.
 - Maintenance work packages lack detail and are deficient in the areas of quality control requirements and pre- and post-maintenance requirements.
 - See Concern MA.1-5.
 - This Concern was addressed in the PT TSA.

CONCERN:
(MA.4-1)
(H3/C1)

The Sandia National Laboratories, Albuquerque, planning, scheduling, and work control system for facility maintenance does not always ensure that maintenance activities are conducted in a timely and efficient manner, as required by DOE 4330.4A.

- FINDINGS:**
- Instances were noted where significant safety-related deficiencies were identified and reported. However, they were not entered into the work control system and prioritized in an effective manner.
 - This Concern was partially addressed in the PT TSA.

CONCERN:
(MA.4-2)
(H1/C1)

Some safety-related maintenance tasks are not entered into the work control system and are not always addressed in a timely manner, as required by DOE 4330.4A.

- FINDINGS:**
- There is no documented SNL, Albuquerque, policy on maintenance-related work control for programmatic equipment.
 - For large accelerators and reactor facilities, planning and scheduling of maintenance is done in a formal manner. For smaller programs employing similar equipment, maintenance is conducted in a much less formal manner.
 - Work packages for maintenance activities on programmatic equipment at smaller facilities are generally nonexistent. Reliance is placed in the knowledge, experience, and reliability of the individual technicians.
 - This Concern was partially addressed in the PT TSA.

CONCERN:
(MA.4-3)
(H2/C1)

The maintenance of programmatic equipment at the smaller experimental facilities is not planned, scheduled, or controlled, as required by DOE 4330.4A.

MA.5 CORRECTIVE MAINTENANCE

PERFORMANCE OBJECTIVE: The material condition of components and equipment should be maintained to support safe and effective operation of all facilities on the site.

- FINDINGS:**
- The Corrective Maintenance Program for real property and facility-related support systems does not ensure that such systems are maintained at a level consistent with the intent of DOE 4330.4A. This was found to be particularly so with regard to facility low-voltage electrical systems. Examples noted included:
 - Numerous defective junction boxes, control panels, and breaker panels. Defects included loose fasteners, missing door handles, exposed conductors, wooden cover panels, corroded or burnt contacts, and burnt out or missing indicator lights.
 - Many instances of nonstandard markings on electrical panels were noted, including the use of felt-tip markers and chalk to indicate switch positions and functions including, in one instance, a cryptic message stating "call (name of individual) immediately if all three lights go out."
 - Numerous instances of poor work practices and code violations including: twisting and taping high-voltage leads rather than using twist nuts, unsupported conduit, wooden supports within junction boxes, hand torquing of critical terminal fasteners rather than the use of a torque screwdriver, inadequate clearance between electrical panels, and wires not labeled.
 - Similar conditions were noted with regard to facility mechanical systems. Examples included:
 - Loose or missing insulation on ducting.
 - Loose or missing fasteners.
 - Leakage around valve stems and seals.
 - Odor of natural gas in one boiler room.
 - Generally poor housekeeping.
 - This Concern was addressed in the PT TSA.

CONCERN:
(MA.5-2)
(H2/C1)

The Sandia National Laboratories, Albuquerque, has not implemented a Corrective Maintenance Program for real property which ensures that equipment is maintained to uniform high standards, as required by DOE 4330.4A.

FINDINGS:

- There is no SNL, Albuquerque, policy describing requirements, responsibilities, and procedures for maintenance on programmatic equipment.
- Corrective maintenance of programmatic equipment is conducted in a nonuniform and informal manner.
- Numerous examples of defective equipment and poor maintenance practices were noted, including:
 - A "fix it when it breaks" mentality.
 - No documented Preventive or Corrective Maintenance Programs.
 - Excessive leakage of hydraulic systems.
 - Poor housekeeping.
 - Loose, unmarked control and instrumentation wiring.
 - Defective cell door closure mechanism.
 - Loose or missing fasteners.
- Maintenance is often performed on the basis of inspection results rather than on a preventive basis.
- Critical systems are not identified and do not receive emphasis from the standpoint of maintenance.
- This Concern was addressed in the PTSA.

CONCERN:
(MA.5-3)
(H2/C1)

The Sandia National Laboratories, Albuquerque, has not implemented a Corrective Maintenance Program for programmatic equipment which ensures that equipment is maintained to uniform high standards, as required by DOE 4330.4A.

MA.6**PREVENTIVE MAINTENANCE**

PERFORMANCE OBJECTIVE: Preventive maintenance should contribute to optimum performance and reliability of systems and equipment important to operations.

- FINDINGS:**
- Preventive maintenance procedures for real property and facility-related equipment are generally limited to simple, nonquantitative, "reminder" type sheets. Quantitative information such as oil types, part numbers, anticipated operating parameters, or other special requirements are not given.
 - A program is underway to upgrade facility related preventive maintenance procedures; however, it is only about 10 percent complete.
 - Extensive reliance is placed on the knowledge, experience, and reliability of the SNL, Albuquerque, craftspersons and subcontractor employees in carrying out maintenance activities in the proper manner.
 - This Concern was addressed in the PTTSA.

CONCERN:
(MA.6-1)
(H2/C1)

The Preventive Maintenance Program for real property is not complete or fully implemented, as required by DOE 4330.4A.

- FINDINGS:**
- The Preventive Maintenance Program for cranes and hoists at SNL, Albuquerque, up until October 1990, consisted of oiling, greasing, and repairing "when broken."
 - A Preventive Maintenance Program for cranes and hoists is under development and is approximately 10 percent complete.
 - The responsibility for crane and hoist inspection and maintenance has been reassigned, and under the current mode, cranes and hoists are inspected by a subcontracted organization and are maintained by a combined force of subcontracted personnel and SNL, Albuquerque, maintenance personnel. Initial inspections early this year have resulted in approximately 90 cranes/hoists being "red tagged." Deficiencies included: frayed cables, defective brakes, excessive hook distortion, etc.
 - A "crash" program has been initiated to correct deficiencies and reactivate the cranes and hoists.
 - See Concern WS.4-5.
 - This Concern was addressed in the PTTSA.

CONCERN: Sandia National Laboratories, Albuquerque, does not have a
(MA.6-2) Preventive Maintenance Program for cranes and hoists which
(H1/C1) identifies and corrects deficiencies in a timely manner, as
required by the Department of Energy Hoisting and Rigging Manual,
29 CFR 1910.179 and OSHA 5A1.

FINDINGS:

- Many of the deficiencies in facility equipment mentioned in Section 4.5.4, MA.5, dealing with corrective maintenance are largely due to earlier shortcomings in the Preventive Maintenance Program which did not identify and correct incipient problems as they were noted. (See Section 4.5.4, MA.5.)
- This Concern was addressed in the PT TSA.

CONCERN: See Concerns MA.4-1, MA.4-2, and MA.5-2.

FINDINGS:

- The Preventive Maintenance Program for programmatic and experimental equipment varies widely from program to program.
- Very good preventive maintenance procedures were noted at the larger experimental accelerator and reactor facilities, although the procedures are not fully upgraded to the requirements of DOE 4330.4A.
- At most of the smaller experimental and test facilities, Preventive Maintenance Programs and procedures did not meet the requirements of DOE 4330.4A. Procedures are either nonexistent or are simple check sheets with instructions such as: inspect, clean, add oil, and record parameters.
- A high degree of reliance is placed on the knowledge, experience, and reliability of the SNL, Albuquerque, and contractor employees in performing preventive maintenance in a complete and correct manner.
- This Concern was addressed in the PT TSA.

CONCERN: The Sandia National Laboratories, Albuquerque, do not have a
(MA.6-3) Preventive Maintenance Program for programmatic equipment that
(H2/C1) ensures complete, detailed and documented maintenance is
performed, as required by DOE 4330.4A.

MA.7 PREDICTIVE MAINTENANCE

PERFORMANCE OBJECTIVE: Maintenance history evaluation and systematic root cause analyses should be used to support maintenance activities and optimize equipment performance.

- FINDINGS:**
- Most maintenance procedures are simple checklists and do not require the recording of sufficient historical or quantitative information to enable trending and predictive maintenance. Where such information is available, it is not reviewed or analyzed to identify trends or to isolate causal factors.
 - Predictive maintenance procedures, which include such techniques as: oil analysis, vibration analysis, and infrared scanning are used in some instances at SNL, Albuquerque, but their use is not widespread, and there is no requirement or formal policy mandating or describing their use.
 - This Concern was addressed in the PTTSA.

CONCERN: The Sandia National Laboratories, Albuquerque, do not have a
(MA.7-2) formal Predictive Maintenance Program for real property and
(H2/C1) programmatic equipment, as required by DOE 4330.4A.

MA.8 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Maintenance procedures and related documents should provide appropriate directions and guidance for work, and should be used to ensure that maintenance is performed safely and effectively.

- FINDINGS:**
- At essentially all facilities visited, there was no evidence of a records control system, as required by DOE 1324.2. The responsibility for records management had not been assigned, a records inventory had not been prepared, and a disposal plan was not in effect.
 - In many instances, records storage was substandard, including storage of records at one location, an unprotected or vulnerable storage locations.
 - See Concern OA.7-3.
 - This Concern was addressed in the PT TSA.

CONCERN:
(MA.8-1)
(H3/C1)

Maintenance records are not controlled, protected, or disposed of, in accordance with DOE 1324.2.

- FINDINGS:**
- Maintenance procedures are not prepared to a uniform format. In some instances, procedures incorporate a high level of detail and descriptive information. In other cases, for equally complex systems, they consisted of simple single line sentences on an index card. Several instances were noted where procedures were handwritten and contained red-marked revisions.
 - Information with regard to approvals, methods for revision, dates, special precautions, etc., is not shown.
 - Drawings used in support of maintenance procedures are generally out of date or are not available. Many drawings, particularly at the test facilities, were simple unnumbered hand sketches.
 - See Concerns OA.7-2 and OP.3-9.
 - This Concern was addressed in the PT TSA.

CONCERN:
(MA.8-2)
(H2/C1)

Maintenance procedures do not provide accurate and complete detailed information to enable users to understand and perform their activities safely and efficiently, as required by DOE 4330.4A.

4.5.5 Training and Certification

4.5.5.1 Overview

This appraisal addressed all 11 Training and Certification performance objectives. The appraisal was conducted through interviews with personnel of the Education and Training Department of the Human Resources organization. In addition, training was discussed with supervisory and operations staff from a selection of diverse organizations including ES&H Training Coordinators from the various organizations. Documentation reviewed included SAND88-1161, Environmental, Safety, and Health Manual, September 1988; the draft version of MN471001, the new ES&H Manual that is to be implemented June 1, 1991; the draft of Division 3524 Policies and Procedures Manual; SAND90-2827, "Pre-Tiger Team Self-Assessment Report," January 1991; and "DOE-AL Self-Assessment Report," April 1991.

Administration of training at SNL, Albuquerque, has been primarily a line function with direct supervision being responsible. In late 1990, the ES&H Training Division was established in the Human Resources organization. This division has the responsibility to provide generic training for all SNL, Albuquerque, and assigned contractor personnel in the Laboratory. This training organization also assists line organizations with their training when requested, and maintains records of training for all Laboratory personnel.

DOE 5480.20, "Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities," specifies training requirements. This Order applies to the reactors and other nuclear facilities. However, the general requirements and personnel selection criteria apply to all training programs as a matter of good practice.

Training results, even when measured, are not always being documented, as evidenced by some training session records failing to include evidence of examinations given or, when given, of examination grades received. In addition, on-the-job training has been conducted without use of structured check sheets to record training material and the trainee's grades. Also, some training records consist of attendance sheets only. Evaluation methods to verify trainee competence were not completely satisfactory; the passing grade for some courses was 50 percent, while in other instances employees who have been in their assignments for a number of years were considered as qualified without examination (grandfathered). These grandfathered employees will, in the future, have to be reexamined every 2 years to determine that their knowledge is acceptable and, if not, they will have to be retrained.

Job task analyses have not been performed. Job descriptions have been written for a number of positions, but there is no standardization of their content. Job task analyses and job descriptions yield bases for job specific training. A new program has been developed and should be fully implemented by year-end. This program is based on self-analysis of each individual's job and will essentially provide the job task analyses and the job descriptions. This program, "ES&H Responsibilities-Qualifications-Performance," will also provide records of all training that each individual has received and, when assignments change, will automatically provide a list of those training courses that are required in the new position.

The PTTSA fully addressed one concern, partially addressed two others, but did not address a fourth. The AL Self-Assessment report addressed training of DOE personnel, but not the specific concerns of this appraisal.

Training programs were found to be good in a few isolated groups. However, training programs at SNL, Albuquerque, have not been consistently and effectively implemented. Training records have not been stored in repositories that provide protection, as required by ASME NQA-1-1989 and DOE 1324.2A. Review of examination results with the trainee has not been consistently the practice, a practice that would help ensure that the intended training messages have been received by the trainees.

4.5.5.2 Findings and Concerns

TC.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: The training organization and administration should ensure effective implementation and control of training activities.

- FINDINGS:**
- Training manuals, with few exceptions, have not been approved.
 - The Sandia Corporate commitment to personnel training has not been properly articulated to all employees.
 - The Human Resources organization established the position of Supervisor for ES&H Training in late 1990. This Supervisor has the responsibility to provide training assistance to SNL, Albuquerque, organizations.
 - Training and qualifications requirements do not exist for some assigned tasks. Requirements that do exist are not standardized, and the ES&H Training Division has no authority to effect standardization.
 - Job task analyses have not been performed. An "ES&H Responsibilities-Qualifications-Performance" program is being developed to provide job task analyses for every SNL, Albuquerque, employee.
 - Job descriptions have not been written for all job assignments. The format and content of those job descriptions that have been written vary widely.
 - Job specific training is conducted primarily as on-the-job training. Organizations using on-the-job training do not uniformly use check sheets to ensure that necessary training is covered and documented. Some organizations do not maintain records of training content.
 - Many experienced employees have been qualified for their jobs based on experience (grandfathered) without having formal training and examinations. Therefore, training records for these employees were not available for audit. DOE 5480.20 requires that these persons be reexamined on a biennial cycle. It has not been 2 years since the date of grandfathering, so reexamination has not yet been required.
 - See Concerns OP.6-2, PT.2-1, and ES.4-1.
 - This Concern was addressed in the PT TSA.

CONCERN: Training commitment and procedures at Sandia National Laboratories, Albuquerque, have not been properly articulated.
(TC.1-2)
(H2/C2)

FINDINGS:

- ASME NQA-1-1989 lists in Appendix 17A-1, Section 3, those records specified as lifetime records. Paragraph 3.6 identifies lifetime records which include "training and qualification records for current members of the plant operating staff."
- Part II "Basic Requirements" of ASME NQA-1-1989 states in Section 17, "Quality Assurance Records," that "records shall be protected against damage, deterioration, or loss." DOE 1324.2A mandates the use of ASME NQA-1-1989.
- Training records are scheduled to be transferred to a form suitable for permanent storage, such as microfiche, and stored so as to be safe from damage.
- Training records are stored in many different locations. The records are stored in standard filing cabinets of various types that are neither fireproof nor waterproof, as observed for storage in the ES&H Training and Health Physics Divisions. Records are not being protected, as required by ASME NQA-1-1989 and DOE 1324.2A during the interval between generation and final filing.
- See Concern MA.8-1.
- This Concern was partially addressed in the PTTSA.

CONCERN:

See Concern OA.7-3.

TC.4 GENERAL EMPLOYEE/PERSONNEL PROTECTION TRAINING

PERFORMANCE OBJECTIVE: General employee and personnel protection training programs should ensure that site/facility personnel, subcontractors, and visitors have an understanding of their responsibilities and expected safe work practices, and have the knowledge and practical abilities necessary to effectively implement personnel protection practices associated with their work.

- FINDINGS:**
- Programs for generic initial and retraining of most employees exist and are essentially up-to-date.
 - There is no lessons learned program that would provide instructions on events, incidents, and accidents that occur at SNL, Albuquerque, other DOE facilities, other nuclear facilities, and in general industry facilities.
 - Technicians who perform surveys on excess property in the Reallocation Yard were given the training course for technicians who collect radioactive waste. The training did not educate them to detect low-level contaminated material.
 - See Section E1.3 and Concerns QV.1-2, SS.4-1, EP.4-1, ES.4-1, and RP.10-2.
 - This Concern was partially addressed in the PTTSA.

CONCERN: The elements and bases for formal training and retraining programs do not exist.
(TC.4-2)
(H2/C2)

- FINDINGS:**
- The following deficiencies were noted in the administration of examinations following training lectures:
 - Examinations were not always reviewed with the trainees after being graded. The fact that a pass or fail grade was received is reported. However, questions that are incorrectly answered are not reviewed with the involved employees to ensure that their response will be based on correct knowledge and not on incorrect beliefs.
 - Some courses did not have examinations. These included "Laser Safety Training," "Laser Safety DLSO Workshop," and the 40-hour initial and 8-hour retraining courses for Hazardous Waste Handlers.
 - Examinations are given following training for many courses. The passing grades for these examinations vary from 100 percent for examinations on emergency actions at the reactors to 50 percent for examinations following the training for the eight courses, such as HAZ 201, "Non-Halogenated Solvents," through HAZ 208, "Corrosives."
 - This Concern was partially addressed in the PTTSA.

CONCERN:
(TC.4-3)
(H2/C2)

Examinations were not always conducted to evaluate the trainees understanding of the course subject material.

TC.9 RADIOLOGICAL PROTECTION PERSONNEL

PERFORMANCE OBJECTIVE: The radiological protection personnel training and qualification program should develop and improve the knowledge and skills necessary to perform assigned job functions.

- FINDINGS:**
- Radiological protection technicians are hired primarily from the Nuclear Navy, with a few holding Associate Degrees in radiological protection. Not all technicians receive specific radiation protection training after they are on SNL, Albuquerque, roles; they do receive job familiarization and general employee training.
 - Some of the radiological protection technicians are sent to offsite training seminars and courses where they receive additional training but not all have been included.
 - The onsite training program for SNL, Albuquerque, radiological protection technicians has not been implemented, although one is in the preparation stage.
 - This Concern was addressed in the December 1990 AL Appraisal.
 - This Concern was not addressed in the PTTSA.

CONCERN: A training program for radiological protection technicians, as
(TC.9-1) required by DOE 5480.11, Section 9.0.(3), has not been
(H2/C1) implemented.

4.5.6 Auxiliary Systems

4.5.6.1 Overview

All nine performance objectives for Auxiliary Systems were addressed in this appraisal. Seven concerns have been cited for six performance objectives. The appraisal has been based on interviews with SNL, Albuquerque, personnel responsible for the auxiliary systems associated with programmatic and facilities-related systems. Tours and inspections of facilities and systems in Technical Areas I, III, IV, V, and a few of the facilities in Coyote Canyon, such as the Solar Power facility, were conducted. Personnel from the Director down through the program and technician level were interviewed.

Available organization charts, directories, and counterpart assistance were used to identify appropriate programs to inspect and programmatic personnel to interview. Documentation, such as SARs, Technical Specifications, Safety Assessments, procedures, test data reports, self-assessment documentation, and other similar system-related documentation were reviewed.

Some of the specific facilities and programmatic areas inspected and appraised include:

- Technical Area I: Bldg. 858, MDL; Bldg. 870, Albuquerque Microelectronics Operation; Bldg. 878, Product Development Laboratory; Bldg. 862, Standby Power Plant; Bldg. 605, Steam Plant; and Bldg. 887, Facilities and Maintenance.
- Technical Area III: Bldgs. 6505 and 6510, Drop Tower; Bldg. 6587, Maintenance and Vehicle Shops; Bldg. 6584, Offices.
- Technical Area IV: Bldg. 961, Reactor Support Facility; Bldg. 970, Simulation Technology Laboratory; Bldg. 983, PBFA II.
- Technical Area V: Bldg. 6588, ACRR and GIF; Bldgs. 6590 and 6593, SPR; Bldg. 6580, Hot Cell; Bldg. 6581, Support; and Bldg. 6582, Emergency Evacuation Center.
- Coyote Canyon: Bldg. 9980, Solar Power Test facilities.

An SNL, Albuquerque, escort was present during all tours, inspections, and interviews.

Of the seven concerns cited for auxiliary systems, the SNL, Albuquerque, PTTSA addressed one concern, partially addressed four concerns, and did not address two concerns. The most significant concern involves the lack of formality of documentation of the requirements and safety considerations for auxiliary systems that are not generally considered to be part of the nuclear facilities in Technical Area V, the accelerators in Technical Area IV, or the newer programs and facilities (such as the MDL) in Technical Area I. Even at these areas, the documentation of procedures and test data records for required periodic tests to assure safe operation of auxiliary systems is not complete. This is especially true of some of the tests and checks performed by outside subcontractors.

Another major auxiliary systems concern involves the handling and disposal of solid, liquid, and gaseous hazardous, radioactive and mixed wastes. For determining the amount of stack emissions of hazardous gaseous wastes, many of the monitoring systems and methods do not provide an accurate measure of the amount released. Low-level radioactive liquid effluent is being released to the soil after being sampled. Methods for reducing the amount of this liquid effluent need to be improved. Currently, solid and slurry radioactive and mixed wastes are being held at the facilities of the waste generator or surface stored at the burial site. Improvement of this situation could be accomplished with the completion of Bldg. 6920, improved programs, and action by DOE to expedite disposal of low-level radioactive and mixed waste.

Most of the concerns noted resulted from the lack of a clear definition and/or understanding of what constitutes an auxiliary system, and what are the safety considerations associated with auxiliary systems. The requirements for the safety-related considerations of auxiliary systems require improved definition. The need to reduce and control hazardous, radioactive, and mixed wastes also is being more vigorously emphasized than in the past, and will result in improved compliance with DOE requirements. Changes in management and personnel emphasis to achieve the desired levels of safety, formality of records and activities, as well as control of hazardous materials, will require a continued dedicated effort by SNL.

4.5.6.2 Findings and Concerns

AX.1 SYSTEMS REQUIREMENTS

PERFORMANCE OBJECTIVE: Auxiliary systems should be considered under the same functional criteria for design, engineering, operation, maintenance, and modifications as the structural, confinement, and primary process system of the facility.

- FINDINGS:**
- Functional requirements for auxiliary systems associated with nuclear reactor and radioactive materials handling facilities in Technical Area V (i.e., ACRR, SPR, Hot Cell, etc.) are documented in SARs and Technical Specifications. However, other documentation, such as procedures, test data, and similar documentation lack formality, traceability, and appropriate references to procedures. This especially pertains to tests performed on auxiliary systems by SNL, Albuquerque, subcontractors.
 - Similarly, the functional requirements for auxiliary systems associated with newer accelerators and other associated experimental facilities in Technical Area IV (PBFA II, High Energy Radiation Megavolt Electron Source (HERMES) III, etc.) are documented in SARs and other appropriate safety documentation. Other procedural and test data documentation for auxiliary systems, however, lack formality and traceability.
 - Specification of the functional requirements for auxiliary systems for facilities in Technical Area I is inconsistent in some cases and absent in others. An example of this inconsistency is a comparison of the functional requirements documentation for the (emergency) Standby Power Generation facility in Bldg. 862 with the documentation for the MDL in Bldg. 858. The functional requirements for MDL are presented in Safety Assessment documentation, while the functional requirements for the Standby Power Generation facility are set forth in miscellaneous memoranda and not formally documented.
 - In general, the facilities that are older, and are not nuclear or accelerator facilities, do not have formal documentation that addresses auxiliary systems and/or safety requirements. This is particularly true for real property equipment, such as the Standby Power Generator (Bldg. 862) and some ventilation and access control systems.
 - Interpretation of the definition of, and requirements for, systems that must be considered as auxiliary systems is inconsistent across the SNL, Albuquerque, site.
 - This Concern was partially addressed in the PTTSA.

CONCERN:
(AX.1-1)
(H2/C1)

The specification and formal documentation of the functional requirements for auxiliary systems at Sandia National Laboratories, Albuquerque, are inconsistent across the site, and in some cases do not comply with the requirements of DOE 5480.1B, Section 7; DOE 5481.1B, Chapter 1; DOE 5480.5, Section 8; and DOE 5480.6, Section 8.

AX.2 EFFLUENT HOLDUP AND TREATMENT

PERFORMANCE OBJECTIVE: Effluent holdup and treatment should ensure that the amount of hazardous substances released to the environment as escaping emissions and/or as effluent gaseous or liquid releases are less than DOE and EPA standards and are ALARA.

- FINDINGS:**
- Stack effluents from Bldg. 858 are not measured, but are determined by calculations based on mass balance and air flow rate up the stack. (Reference: "Organization 2000 Self-Assessment Jump Start Report," Finding 4B2-1-19.)
 - Hazardous waste accumulation/collection sites in Bldg. 858 are not under the control of the operator generating the waste. (Reference: "Organization 2000 Self-Assessment Jump Start Report," Finding 4A1-2-14.)
 - The Hot Cell stack monitor in Bldg. 6581 of Technical Area V has recently been installed and made operational. The procedures for operation of the system and for performing required activities to measure stack effluent, such as "counting the filters," are neither completed nor in use.
 - Final release of low-level contaminated liquids from the Hot Cell, ACRR, and SPR at Technical Area V is to an existing septic field and/or storm drainage. The liquid waste is sampled before release to assure the contamination levels are within permitted guidelines. These releases are not evaluated against ALARA criteria. (See Concern RP.11-2.)
 - Contaminated resins (radiation level approximately 1 to 2 milliroentgens/hour (mr/hr) from the water purification system at ACRR are being stored at ACRR or Bldg. 6596 until an appropriate disposal method at SNL, Albuquerque, is provided. (Note: The resins are wet and in an aqueous slurry.)
 - Construction of a building to handle some of the liquid and solid radioactive and mixed wastes (Bldg. 6920) is nearly complete, but has been stopped due to fiscal limitations. In addition, the long lead equipment necessary for this facility has not been ordered.
 - This Concern was addressed in the PT TSA.

CONCERN: Monitoring and disposal of hazardous and radioactive effluents at
(AX.2-1) Sandia National Laboratories, Albuquerque, is not consistent with
(H2/C1) the requirements of DOE 5480.4, Attachment 1, Section 2b; DOE
5484.1, Chapter IV; DOE 5480.11, Sections 5 and 8.

AX.3**SOLID WASTES**

PERFORMANCE OBJECTIVE: Solid hazardous wastes (including radioactive wastes) should be controlled to minimize the volume generated and handled in a manner that provides safe storage and transportation.

- FINDINGS:**
- Solid contaminated radioactive and mixed waste at the Technical Area V Hot Cell are collected and held at the Hot Cell or the "Sand Lot" for future disposal (planned future disposal at the Waste Isolation Pilot Plant).
 - Solid radioactive and mixed waste cannot be disposed of offsite and must be stored at the generator's facility or aboveground at the interim storage site landfill in Technical Area III.
 - Bldg. 6920, at which completion of construction has been delayed, is planned to be the staging area for disposition of solid waste.
 - Programs and procedures for handling, minimizing, and disposing of radioactive and mixed wastes are in preparation but are not complete.
 - This Concern was partially addressed in the PT TSA.

CONCERN:
(AX.3-1)
(H2/C1)

The storage of solid radioactive and mixed waste at the generator's facilities is not consistent with the requirements of DOE 5480.4, Attachment 1, Section 2b, and DOE 5480.11, Sections 5 and 8, and presents potential for unnecessary personnel exposure.

- FINDINGS:**
- The accumulation of radioactive and mixed waste on site is contrary to the ALARA principle. Disposal is hampered by lack of an approved site for disposal of waste.
 - SNL, Albuquerque, is currently prohibited from disposing of radioactive or radioactive mixed waste on site. SNL, Albuquerque, and AL plan to ship the waste to the Nevada Test Site (NTS). NVO-325 (rev. 1), "Draft, Nevada Test Site Defense Waste Acceptance Criteria, Certification and Transfer Requirements," September 1990, prepared jointly by the Nevada Operations Office, DOE, and Reynolds Electrical and Engineering Co., Inc., outlines the generator application and approval process. This document requires Headquarters, DOE, designation of the waste as defense waste before it is evaluated for acceptance by NTS. Although a letter (MDS:ESHB:SEU) July 2, 1990, to N. R. Ortiz of SNL from Thomas B. Hyde, Chief, Environmental, Safety and Health Branch, Management Support Division, AL indicates that the approved designation of SNL as a generator of defense waste for purposes of disposal at NTS is attached, the Headquarters, DOE, letter attached does not say that.

- A June 19, 1990, letter from James E. Dieckhoner, Acting Director, Division of Site Operations, Environmental Restoration and Waste Management, to P. Higgins, Albuquerque Operations Office, indicated that Headquarters, DOE, will not authorize shipment without National Environmental Policy Act documentation and certification that the waste is properly characterized and can meet all of the requirements of NVO-325. Since one of the NVO-325 requirements is the certificate from Headquarters, DOE, the NVO-325 requirements are not met.
- This Concern was partially addressed in the PT TSA.

CONCERN:
(AX.3-2)
(H2/C2)

Headquarters, Department of Energy, has not provided the defense waste generator certification necessary to meet the requirements of NVO-325 (revision 1), "Draft, Nevada Test Site Defense Waste Acceptance Criteria, Certification and Transfer Requirements," September 1990.

AX.4 STORAGE AND HANDLING OF FISSILE MATERIAL

PERFORMANCE OBJECTIVE: Fissile material should be stored and handled in a manner which minimizes the chances of loss, contamination, release, or inadvertent criticality.

- FINDINGS:**
- An April 1, 1991, correspondence from AL to SNL, Albuquerque, with an attached copy of a January 1991 AL report on the implementation of the requirements of DOE 5481.1B and AL 5481.1B "Safety Analysis and Review Systems," at SNL, Albuquerque, was provided to the team on May 10, 1991. The report cites deficiencies in the SNL, Albuquerque, implementation of the Orders and requested an action plan that addresses the findings in the report and a plan for implementation.
 - Fissile material is stored in three locations at Technical Area V. These are the Hot Cell, ACRR, and the SPR.
 - Although separate criticality analyses have been performed, the SARs for the Hot Cell, ACRR, and SPR did not include a safety analysis for bounding conditions and tests for safe storage areas.
 - This Concern was not addressed in the PTSA.

CONCERN:
(AX.4-2)
(H2/C1)

Storage of fissile material in Technical Area V is not considered in the Safety Analysis Report, as required by DOE 5480.5, Section 8A and DOE 5481.1B, Chapter 1, Section 4. (See Concern CS.3-1.)

AX.5 VENTILATION SYSTEMS

PERFORMANCE OBJECTIVE: Ventilation systems should reliably direct all airborne effluents from contaminated zones or potentially contaminated zones through cleanup systems to ensure that the effluent reaching the environment is below the maximum permissible concentration and is ALARA.

- FINDINGS:**
- Responsibility for maintaining the balance of air flow for the ventilation systems is shared by the facilities group (for facilities assigned equipment) and by the programmatic groups (for programmatic assigned equipment). Balancing of air flows is necessary to assure flow is from clean to less clean areas.
 - There is no installed instrumentation to indicate the proper amount and direction of ventilation air flow.
 - There was no evidence of calibration of magnahelic gauges that indicate the pressure drop and flow direction across the high-efficiency particulate air (HEPA) filters for most filter locations. Most magnahelic gauges had stickers stating "calibration not required."
 - Efficiency tests on the HEPA filters in Technical Area V are performed exclusively by a subcontractor on a regularly scheduled basis. Inspection of the procedures, contract documentation, and test data sheets received from the subcontractor for filter tests at ACRR do not specify the requirements and procedures to which the filters are tested. (See Concern RP.10-4.)
 - This Concern was addressed partially in the PTTSA.

CONCERN: Ventilation air flow from clean to less clean areas to control
(AX.5-1) contamination cannot be ensured due to the potential for blockage
(H2/C2) in the filters. (See Concerns QV. 6-1 and QV. 4-1.)

AX.8 ENGINEERED SAFETY SYSTEMS

PERFORMANCE OBJECTIVE: Engineered Safety systems should be reliable and available to provide protection to the facility when required.

- FINDINGS:**
- The SARs, Technical Specifications, Safety Assessments, and similar safety programmatic documentation at SNL, Albuquerque, in general, address engineered safety systems for the reactor, accelerator, and new development programs.
 - For some of the smaller and older programs, as well as some of the safety systems provided by the Facilities Directorate (Org. 7800) such as the (emergency) Standby Power Generator in Bldg. 862 in Technical Area I, formal engineering specifications, procedures, and similar formal documentation of tests and periodic checks are not available.
 - Some of the ventilation and drain systems at SNL, Albuquerque, are important to safety. Examples are the ventilation and drain systems for the reactors and Hot Cell at Technical Area V, some of the ventilation and drains for the accelerators in Technical Area IV, and the development buildings in Technical Area I. In many cases, the requirements for the safety aspects of many of these systems are not documented.
 - Some tests to ensure proper operation of many safety systems are contracted to outside vendors; others are performed by SNL, Albuquerque, personnel. Formality and documentation for some of these safety system tests is inadequate or nonexistent.
 - This Concern was not addressed in the PTTSA.

CONCERN: There is no program to ensure that tests and checks on engineered
(AX.8-1) safety systems are performed to ensure system reliability and
(H2/C2) safety. (See Concern QV.6-1.)

4.5.7 Emergency Preparedness

4.5.7.1 Overview

Emergency preparedness at SNL, Albuquerque, was evaluated against each of the seven performance objectives in DOE/EH-0135, "Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites," June 1990, which includes by reference the emergency preparedness requirements in Draft DOE 5500.3A. The evaluation included tours of facilities, numerous discussions with contractor personnel and TSA specialists, reviews of documentation, and observation of actual emergency responses. Provisions for coordinated responses to emergencies were reviewed, i.e., concept of operations, interfaces, command, control, communications, information flow, training, and sitewide emergency preparedness program management.

Although S&H Subteam observed preparations for an emergency exercise scheduled to be conducted during the TSA, the exercise was aborted due to several real and false alarms that demanded actual responses during the scheduled exercise period. Observations of the actual responses were considered to be an acceptable substitute for an exercise.

A matrix management approach is used for emergency preparedness and emergency response. Medical, Security, and Fire Protection departments are line organizations. Radiation protection and environmental programs are run by various divisions; provisions for emergency environmental, and hazardous materials monitoring and control are maintained in ES&H. The SNL, Albuquerque, Emergency Operations Center (EOC) is maintained in the Emergency Preparedness and Occurrence Reporting Division of Security Operations. Security Operations also provides initial alarm response, most of the time, and provides cohesive training for all emergency response personnel. The staff which maintains the EOC is also responsible for the development of the sitewide Emergency Plan. The Security Division also provides an on-the-scene Commander in a well-equipped van to coordinate overall emergency responses.

Offsite support is available for emergency response to major illness or fire, treatment of injured and contaminated patients, or a mass casualty event. Formal support agreements exist between SNL, Albuquerque, and the Kirtland Air Force Base Fire Department and the University of New Mexico Hospital (UNMH). AL maintains its own onsite Emergency Operations Center. UNMH has provided emergency helicopter evacuation of a heart attack victim from the site to the hospital. An annual exercise with the UNMH helicopter is conducted in Technical Area III. The City of Albuquerque conducts a mass casualty drill biennially; the last one involved a simulated commercial airline crash in which high school students acted as "victims." The Kirtland Air Force Base Fire Department has the capability to smother an aircraft fire within 5 minutes after arriving on the scene.

For emergency preparedness and hazards identification the SNL, Albuquerque, site is divided into 75 sectors, each having a designated Sector Chief. Sector Area Plans identify the hazards in the areas and immediate emergency action plans. Each office and laboratory has recently participated in the Sandia Workplace Hazards Awareness System, which has resulted in a uniform and concise method of identification and posting of hazards in various areas.

Some 6,000 warning signs have been developed and posted, which are especially useful to first responders in an emergency. These signs are scheduled to be updated at least semiannually. Since each sign was individually designed by the area owners, this system has considerably elevated the safety consciousness of a large fraction of the personnel at SNL, Albuquerque.

Tours of facilities and reviews of various safety documents revealed that the hazards at this site are typical of the hazards that exist in any moderately large city; e.g., Albuquerque. Moreover, SNL, Albuquerque, either has under its control, can obtain through mutual aid agreements, or has available informally, sufficient resources prepared to deal effectively with any credible emergency due to accidents initiated on the site. This is a value judgment based on observations and discussions during the site visits and reviews of safety analyses and Sector Area Plans. SNL, Albuquerque, plans to prepare qualitative and quantitative risk assessments that can confirm this value judgment.

SNL, Albuquerque, does not have an approved sitewide Emergency Plan, but a final draft is in the last stages of internal review; this draft adequately describes the concept of operations, duty assignments, resources, training requirements, etc., that currently exist or are planned for the near future. Emergency Plan Implementing Procedures are yet to be developed. Currently, plans and procedures exist in the various specialties that support the emergency preparedness organization; e.g., medical, fire, security, radiological, and hazardous material specialties.

There are nine Category III concerns with regard to emergency preparedness; eight pertain to SNL, Albuquerque, and one to AL. Satisfactory resolution of these concerns, especially in regard to communications during an emergency, will significantly improve the level of emergency preparedness at SNL, Albuquerque.

Of these nine concerns, three were fully addressed in the PTSA and AL Self-Assessment reports. Six concerns relate to specific aspects of emergency preparedness, which were not addressed in either the PTSA or the AL Self-Assessment.

Overall, emergency preparedness is high, but formal plans and procedures do not strictly meet DOE requirements. All of the personnel contacted during this appraisal, in both SNL, Albuquerque, and support organizations were competent, well-versed, highly motivated, and cooperative. Greater management attention is needed to assess priorities, assess schedules, and allocate resources; to maintain the current level of preparedness and alleviate the concerns identified; and to achieve desirable improvements in emergency preparedness.

4.5.7.2 Findings and Concerns

EP.2 EMERGENCY PLAN AND IMPLEMENTING PROCEDURES

PERFORMANCE OBJECTIVE: The emergency plan, the emergency plan implementing procedures, and their supporting documentation should provide for effective response to operational emergencies.

- FINDINGS:**
- SNL, Albuquerque, does not have an approved Emergency Plan and lacks numerous Emergency Plan Implementing Procedures. A final draft of a plan is in the process of review at SNL, Albuquerque.
 - The current draft of the Emergency Plan does not address the planned role of the facility owners and Sector Chiefs in emergency response.
 - This Concern was addressed in the PT TSA.

CONCERN: Sandia National Laboratories does not have an approved Emergency Plan and Emergency Plan Implementing Procedures, as required to DOE 5500.1A and DOE 5500.3A. (See Concern FP.6-1.)
(EP.2-1)
(H2/C1)

- FINDINGS:**
- Firemen depend on the availability of SNL, Albuquerque, building owners and/or Sector Chiefs for details regarding hazardous materials in buildings. However, these assets are not assuredly available about 75 percent of the time; e.g., nights and weekends.
 - Sector Area Plans at SNL, Albuquerque, which are not readily available to firemen, contain generic descriptions of hazardous materials in various buildings, but these are revised only annually and are not necessarily up to date. (See Concern FP.6-1.)
 - Two areas at SNL, Albuquerque, have developed a bar code system for maintaining a real time inventory of hazardous materials; i.e., Bldg. 858 MDL and the Hazardous Waste Area. However, this system does not show the exact locations of the materials in the buildings.
 - On May 5, 1991, an informal agreement was reached between the Kirtland Air Force Base Deputy Fire Chief and the SNL, Albuquerque, Emergency Preparedness Coordinator that detailed prefire plans for selected vital buildings would be provided, to include the hazardous materials information desired by the Fire Department. Also, more frequent tours of these buildings would be arranged for firemen.
 - This Concern was not addressed in the PT TSA.

CONCERN: Detailed information regarding hazardous materials in vital
(EP.2-2) buildings is not readily available to the Fire Department, as
(H1/C1) required by NFPA 1500. (See Concern CS.5-1.)

FINDINGS:

- Sector Area Plans contain the essentials of area and building Emergency Planning Zones (EPZs), although they are not called EPZs. These should satisfy the DOE planning requirements in this regard for onsite fixed facilities. However, no EPZs are established for risks due to fixed hazards located outside the Laboratory grounds which could require onsite emergency response; e.g., for the two 55,000-pound chlorine tanks at the Albuquerque Sewage Treatment Plant. SNL, Albuquerque, is within the EPZ for these tanks.
- SNL, Albuquerque, is beginning a program to identify offsite hazards that could involve the SNL, Albuquerque, site.
- This Concern was not addressed in the PT TSA.

CONCERN: Emergency Planning Zones for fixed offsite hazards have not been
(EP.2-3) established, as required by NFPA 1500.
(H2/C1)

FINDINGS:

- Neither Technical Area V, nor the Coyote Test Complex (CTC) include formal provisions in experiment evaluation safety reviews for consideration of emergency response, emergency notifications, planned immediate actions in the event that experiment safeguards fail, or the need for consideration of pretest notifications of the emergency preparedness organization.
- The CTC Technical Manager has instituted an informal Test Operations Review procedure and schedule to review the safety implications of experiments to be conducted during each week. The associated checklist does not include explicit consideration of the necessity for emergency preparedness interaction.
- This Concern was not addressed in the PT TSA.

CONCERN: Experiment test planning is not coordinated with appropriate
(EP.2-4) emergency planning and/or emergency response organizations. (See
(H3/C2) Concern EA.2-1.)

FINDINGS:

- AL does not have an approved Emergency Plan. A final draft, due May 15, 1991, is in preparation.
- This Concern was addressed in the AL Self-Assessment.

CONCERN: The Albuquerque Operations Office does not have an approved
(EP.2-5) Emergency Plan, as required by DOE 5500.1A.
(H3/C1)

EP.3 EMERGENCY RESPONSE TRAINING

PERFORMANCE OBJECTIVE: Emergency response training should develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

- FINDINGS:**
- Emergency response training in Technical Areas is presented and controlled in the various technical support departments (e.g., medical, fire, security, hazardous materials, environmental monitoring).
 - The Emergency Preparedness Department training centers on command, control, communications, and concept of operations.
 - Training modules based on the current Draft Emergency Plan are not fully developed. Those that are developed are excellent and are being implemented in training programs.
 - The lead Emergency Preparedness Department resource for the emergency preparedness training module development is about to retire, yet no effort was underway to obtain a replacement.
 - This Concern was partially addressed in the PTTSA.

CONCERN: See Concerns EP.2-1 and TC.4-2.

EP.4

EMERGENCY PREPAREDNESS DRILLS AND EXERCISES

PERFORMANCE OBJECTIVE: Emergency preparedness programs should include provisions for simulated emergency drills and exercises to develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

- FINDINGS:**
- A major exercise was initiated during the TSA. However, it was canceled because of several actual emergency conditions. This provided the S&H Subteam the opportunity to observe actual emergency responses, which was considered adequate for the TSA appraisal objectives.
 - The S&H Subteam reviewed a number of drill scenarios and critiques, as well as critiques of real emergency responses that occurred over the past few years. It was observed that a number of reoccurring problems have not been corrected, as documented in the Emergency Preparedness Department's drill and critique notebook at the SNL, Albuquerque, Emergency Operations Center (EOC).
 - Communication problems at the EOC are persistent. Failures of cellular telephones is a chronic and well-known problem, yet these telephones are planned as a major asset during a response for which the EOC is activated. Moreover, these telephones are known to set off false alarms. A concerted effort to solve this long-standing problem was not apparent during this appraisal.
 - The technical support stations in the EOC are not routinely established when the EOC was activated. This caused the management participants to be constantly on the telephones, which significantly interfered with their management roles.
 - The use of checklists in the EOC was not evident.
 - The team observed instances of a failure in the EOC to verify information in a timely manner, both in a drill and during an actual event. This recurring problem has been noted previously in drill critiques.
 - The On-Scene Commander was observed to have two major roles that often interfered with each other. This person is to assure an orderly coordinated response at the scene, and to assess the need for and obtain additional resources, if necessary. The Commander is also the EOC principal contact for on-the-scene information. In a rapidly developing situation, the commander's attention is correctly addressed to controlling the situation at the scene rather than communicating with the EOC. EOC information flow suffers. (The EOC does not have an assigned on-the-scene, dedicated EOC communicator.)

- During the delay in the planned exercise, it was observed that there was confusion in the EOC as to which event was real, and which was not. It is clear that the frequency of real events is high (although many are false alarms), yet provisions are not in place in the EOC to clearly distinguish between drills and exercises from real events (or two concurrent events from each other).
- In response to an S&H Subteam inquiry, a member of SNL, Albuquerque, senior management stated that communications is the biggest problem in the EOC.
- This Concern was addressed in the PTTSA.

CONCERN:
(EP.4-1)
(H2/C2)

Lessons learned from drills, exercises, and actual events are not being investigated for root causes and solutions, especially in the area of communications.

EP.5 EMERGENCY FACILITIES, EQUIPMENT AND RESOURCES

PERFORMANCE OBJECTIVE: Emergency facilities, equipment, and resources should adequately support site/facility emergency operations.

- FINDINGS:**
- Maintenance support is often not readily available during off-hours; i.e., about 75 percent of the time, when security personnel are the first responders.
 - During off-hours, Security personnel most often call upon technicians from the Steam Plant for support with maintenance problems.
 - This Concern was not addressed in the PT TSA.

CONCERN: The timely availability of craft support during off-hours is not
(EP.5-1) assured.
(H2/C2)

EP.6 EMERGENCY ASSESSMENT AND NOTIFICATION

PERFORMANCE OBJECTIVE: Emergency assessment and notification procedures should enable the emergency response organization to correctly classify emergencies, assess the consequences, notify emergency response personnel, and recommend appropriate actions.

- FINDINGS:**
- Although computer codes are widely available for projecting the consequences of releases of hazardous chemicals to the atmosphere, their use in emergency planning and emergency response is not evident at SNL, Albuquerque.
 - This Concern was not identified in the PTTSA.

CONCERN: A methodology for rapidly assessing potential consequences of
(EP.6-1) hazardous chemical releases to the atmosphere is not readily
(H3/C2) available for emergency response.

EP.7**PERSONNEL PROTECTION**

PERFORMANCE OBJECTIVE: Personnel protection procedures should control and minimize personnel exposure to any hazardous materials during abnormalities, ensure that exposures are accurately determined and recorded, and ensure proper medical treatment.

- FINDINGS:**
- Contrary to widely accepted and utilized practice, a rough terrain vehicle equipped for atmospheric monitoring of particulates and gases, e.g., radioiodine, is not available to the radiological environmental monitoring team. The team is currently attempting to acquire such a capability.
 - This Concern was not addressed in the PTTSA.

CONCERN: Field mobility of atmospheric radiological monitoring teams during an emergency is restricted due to the lack of a suitably equipped rough terrain emergency vehicle.
(EP.7-1)
(H2/C2)

4.5.8 Technical Support

4.5.8.1 Overview

This assessment was based on the performance objectives and criteria given in DOE/EH-0135, "Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites," June 1990. Of the eight performance objectives in Technical Support, six were addressed in this section. Objective TS.6 was covered in the Packaging and Transportation section, while Objective TS.8 Criticality Safety was addressed in the section on Nuclear Criticality Safety.

The SNL, Albuquerque, programs and facilities are very broad. Therefore, this assessment was conducted on a sampling basis. The appraisal is based on review of general information documents provided by the contractor prior to the site visit and review of documents during the assessment period on site. These included documents and reports on procedures, policy, technical specifications, SARs, completed work packages, and log sheets for technical support activities. In addition, SAND90-2827, "Pre-Tiger Team Self-Assessment Report," January 1991, and SAND90-3192, "PTTSA Action Plan Report," February 1991, were reviewed. Reports on the SNL, Albuquerque, Jump Start Program were also reviewed.

Interviews with SNL, Albuquerque, management and staff, technicians, and inspectors were conducted in numerous organizations, including the 7000 Technical Support area. This area includes construction, shops, and testing. It was also necessary to interview numerous other test facility personnel because the programmatic technical support responsibilities reside with them. Numerous facilities were visited including ACRR, SPR II and III; the GIF, and Hot Cells in Technical Area V; the large centrifuges in Technical Area III, and the Hypersonic Wind Tunnel and the Electromagnetic Test Facility in Technical Area I. The National Solar Thermal Test Facility was also inspected.

All SNL, Albuquerque, interviewees had sufficient or superior formal education and experience for their positions. The staff was professional, enthusiastic, and dedicated. All appeared to have accepted the new ES&H and Conduct of Operations requirements. However, some new procedures are being initiated and implemented without adequate review and approval. A constantly recurring positive finding was that technical facility (programmatic) managers display clear ownership of their areas. They follow SNL, Albuquerque, general guidance manuals. However, each conducts his business in his own way to a large extent. Apparently this is done because the appropriate SNL-wide control and safety requirements are not yet fully in place.

Three concerns were identified in this assessment, one each in TS.1 (Organization and Administration), TS.2 (Procedures and Documents), and TS.3 (Facility Modifications). There were no concerns that required immediate action. The concern in TS.1 was addressed in the PTTSA, but the other two were not.

In summary, personnel associated with technical support are dedicated professionals who appear to have accepted new ES&H requirements and are responding satisfactorily. The concerns expressed in this technical support

section are mainly the result of a lack of formality of operations, which is being corrected by SNL, Albuquerque.

4.5.8.2 Findings and Concerns

TS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: The technical support organization and administration should ensure effective implementation and control of technical support activities.

- FINDINGS:**
- Individual position descriptions generally are not available. Position descriptions do appear in the recent "Plan of Operations and Practices" for the Facilities Construction and Environmental Engineering Department (Org.7850). (Distributed 10/22/90, but not dated.) Position descriptions are required by DOE 5480.19.
 - Controls for assuring ES&H performance on technical support operations were absent at times (see Section WS 4.5.15).
 - This Concern was addressed in the PT TSA.

CONCERN: Individual responsibilities and authorities are not clearly delineated throughout Sandia National Laboratories, Albuquerque, technical support organizations, as required by DOE 5480.19. (TS.1-2) (H2/C1) (See Concerns OA.1 and OP.1-2.)

TS.2 PROCEDURES AND DOCUMENTS

PERFORMANCE OBJECTIVE: Technical support procedures and documents should provide appropriate direction, allow for adequate record generation and maintenance for important activities, and should be properly and effectively used to support safe operation of all facilities on the site.

- FINDINGS:**
- Approved Technical Specifications and SARs are in place for the Technical Area V nuclear facilities and reactors.
 - Preliminary Hazards Analyses have been performed for the major facilities on site.
 - Documentation of procedures and completed work packages have varied from facility to facility. One package for modification of Bldg. 6582 (start order dated November 11, 1988) was extensive. Packages in the Electromagnetic Test Division are adequate. Other work packages for Technical Area III tests consisted of log sheets and checkoff sheets. One package for a test on a Technical Area V reactor did not indicate whether or not the test was ever performed. None of the packages inspected contained a list of contents.
 - Some completed work packages were immediately retrievable. Others took up to 10 days to assemble/retrieve.
 - The approval committee records showing approval of a test in a Technical Area V reactor facility were not in the completed work package. (Later, copies of the test records and approvals were provided.)
 - This Concern was not addressed in the PT TSA.

CONCERN: There is no reliable Sandia National Laboratories, Albuquerque,
(TS.2-1) system for developing and controlling procedures and documents
(H2/C2) for technical support, including those important to environment,
 safety, and health. (See Concerns MS.1-1 and EA.2-2.)

TS.3 FACILITY MODIFICATIONS

PERFORMANCE OBJECTIVE: Technical support services required by each facility on the site to execute modifications should be carried out in accordance with sound engineering principles that should assure proper design, review, control, implementation, and documentation in a timely manner.

- FINDINGS:**
- Large construction/modification projects managed by Technical Support (Org. 7000) require appropriate concurrences from ES&H and Safeguards and Security. Smaller projects (less than \$150,000) do not. (See Concern SS.1-1.)
 - A facility modification in Bldg. 865 done several years ago still showed signs of incomplete job closeout. The job was left with a steel I-beam supporting deck grating and a 100-pound gas bottle. The I-beam was supported by a 2- by 4-inch wood support. (This was corrected by SNL, Albuquerque, when reported.)
 - Work done on programmatically owned facilities is controlled by the facility manager. The work appears to be acceptable, but the process is not rigorous.
 - Documentation was frequently inadequate to establish the quality of engineering for technical support. (See Concern TS.2-1.)
 - There are no defined systems for conducting Operational Readiness Reviews.
 - This Concern was not addressed in the PTTSA.

CONCERN: There is no Sandia National Laboratories, Albuquerque, system to
(TS.3-2) ensure proper design, review, control, and documentation of all
(H2/C2) facility modifications. (See Concerns FR.1-1, OP.3-1, WS.5-3.)

4.5.9 Packaging and Transportation

4.5.9.1 Overview

All 12 of the performance objectives in the Packaging and Transportation technical area were addressed in this appraisal. Information was obtained by: (1) reviewing policies, procedures, the SAND88-1161, Environmental, Safety, and Health Manual, September 1988, QA, receipts and shipments of materials, AL appraisals and SNL, Albuquerque, internal audits; (2) interviewing packaging and transportation personnel in the Transportation Services Division; the Storage and Equipment Services Division; the Shipping and Receiving Division; the Hazardous Material/ES&H Coordination Division; the Traffic, Travel and Stores Management Division; the Hazardous Waste and Wastewater Division; and the Radioactive and Mixed Waste Division; (3) observing packaging and transportation activities in Bldgs. 957, 819, 958, 959, 867, 894, Technical Area V, 6000 Igloo Area, Bldg. 6920, an unfinished radioactive waste facility, and a landfill area used for radioactive waste storage; and (4) observing SNL, Albuquerque, hazardous waste contractors Rinchem Company, Inc., and Rollins ChemPack, Inc.

The packaging and transportation operations were being performed safely; however, there is potential for safety concerns, as confirmed by recent DOE and SNL, Albuquerque, appraisals, the PT TSA and the ES&H Self-Assessment Jump Start Program. Some deficiencies were identified in those appraisals, and there are work, planning, and action plans in progress to correct the deficiencies. Some very positive steps are being taken in packaging and transportation, and this is a credit to the experienced personnel. However, there is a serious SNL, Albuquerque, problem affecting packaging and transportation operations that deserves top SNL, Albuquerque, and DOE management attention, namely, disposal of liquid and solid radioactive and mixed wastes.

A summary of the deficiencies are: (1) packaging and transportation activities are fragmented and no single person or organization is responsible; (2) QA plans and independent audit plans have not been developed for all packaging and transportation activities; (3) there is no formal training and qualification program; (4) an emergency communication and response plan for packaging and transportation of hazardous materials is not available; (5) operating procedures for packaging and transportation of hazardous wastes are not available or not properly implemented; (6) onsite transportation of hazardous materials is not being performed in accordance with the onsite transportation manual; (7) there is no independent safety oversight; (8) the current Transportation Safety Committee does not include all organizations involved in packaging and transportation activities; and (9) there is no transportation safety manual.

The SNL, Albuquerque, Self-Assessment addressed all nine concerns and action plans were in place to correct the majority of the deficiencies. The ES&H Self-Assessment Jump Start Program also identified nine additional deficiencies for packaging and transportation.

In conclusion, the major efforts already initiated in packaging and transportation, QA, training, procedures, transportation safety manual, and

Transportation Safety Committee should be vigorously pursued to completion.
Special attention should be given to radioactive and mixed waste disposal.

4.5.9.2 Findings and Concerns

PT.1 ADMINISTRATION AND ORGANIZATION

PERFORMANCE OBJECTIVE: Management should develop and implement a system of policies and directives that will provide for effective implementation of DOE Orders, particularly DOE 5480.3, DOE 1540.1, DOE 1540.2, Federal and State regulations, and good industrial practices in operations involving packaging and transportation of hazardous materials.

- FINDINGS:**
- There was no central organization for packaging and transportation activities. Packaging and transportation activities are carried out in five major organizations and in several other small groups.
 - There was no control system to ensure that all persons involved in packaging and transportation activities had ready access to current procedures.
 - There was no procedures manual for packaging and transportation activities. Procedures were fragmented in the many organizations involved in packaging and transportation.
 - There was no sitewide transportation safety manual.
 - A Transportation Safety Committee Charter was approved April 18, 1991. This Committee has been formed and has been meeting since January 1991. Not all packaging and transportation organizations are represented.
 - This Concern was addressed in the PT TSA.

CONCERN:
(PT.1-1)
(H2/C1)

The overall management system does not provide control over packaging and transportation activities at Sandia National Laboratories, Albuquerque, as required by DOE 5480.3.

- FINDINGS:**
- There was no ES&H oversight of line functions, as required by DOE 5480.1B.
 - There was no line safety oversight or independent safety oversight, as required by SEN-6.
 - Packages are checked by the same people who provide packaging instructions with no independent oversight.
 - This Concern was addressed in the PT TSA.

CONCERN:
(PT.1-2)
(H3/C1)

There is no independent safety oversight, as required by DOE 5480.1B and DOE 5482.1B.

PT.2 TRAINING

PERFORMANCE OBJECTIVE: Personnel should be trained, qualified, and certified in handling hazardous materials, as required by DOE 5480.3 and 49 CFR.

- FINDINGS:**
- There was no formal documented training program for packaging and transportation employees involved in radioactive and hazardous materials and wastes.
 - There was no formal certification or recertification program for all packaging and transportation employees.
 - On-the-job training requirements were not identified or documented.
 - There was no Lessons Learned Program for packaging and transportation activities.
 - There were no job task analyses to determine the training or qualification needed for packaging and transportation employees.
 - There were no procedures requiring that packaging and transportation employees be qualified for a specific task, nor for how the qualification was to be obtained.
 - See Concerns QV.1-2 and TC.1-2.
 - This Concern was addressed in the PTTSA.

CONCERN: There is no formal training and qualification program for all
(PT.2-1) packaging and transportation employees, as required by DOE 5480.3
(H2/C1) and 49 CFR Parts 100-199, 391, 392, 393 and 396.

PT.3 QUALITY ASSURANCE

PERFORMANCE OBJECTIVE: A system of checks and balances should exist that ensures the quality assurance (QA) requirements of the applicable DOE Orders, especially DOE 5700.6B, and ANSI NQA-1989 are met.

- FINDINGS:**
- There was no SNL, Albuquerque, QA plan for packaging and transportation.
 - Three of five major organizations involved in packaging and transportation had QA plans.
 - There were no independent QA audits, although some internal audits were available.
 - There was no system in place for routine internal audits of packaging and transportation activities.
 - There were no QA checks for new packagings supplied by vendors and fabricated at SNL, Albuquerque,.
 - There was no independent SNL, Albuquerque, program for internal appraisals of all packaging and transportation activities.
 - See Concerns QV.1-1 and 1-3.
 - This Concern was addressed in the PT TSA.

CONCERN: Quality assurance plans have not been developed for all packaging
(PT.3-1) and transportation activities consistent with DOE 5700.6B.
(H2/C1)

PT.5 ACCIDENTS AND INCIDENTS

PERFORMANCE OBJECTIVE: Accidents and incidents involving packaging and transportation of hazardous materials should be reported in a timely manner to DOE.

- FINDINGS:**
- There was no emergency communication and response plan for packaging and transportation emergencies involving hazardous materials.
 - This Concern was addressed in the PT TSA.

CONCERN: An emergency communications and response plan for packaging and transportation emergencies involving hazardous materials was not available, as required by 49 CFR 172.600.
(PT.5-1)
(H2/C1)

PT.6 OPERATIONS

PERFORMANCE OBJECTIVE: Sitewide operations involving packaging and transportation of hazardous materials should be conducted in a safe, consistent, and accountable manner, following approved procedures, in conformance with applicable standards and accepted practices.

- FINDINGS:**
- Hazardous waste is currently being handled and moved onsite and offsite by SNL, Albuquerque, contractors who are trained in all aspects of hazardous waste packaging and transportation.
 - Not all packaging and transportation operating procedures are documented, controlled, and current.
 - Packaging and transportation procedures appear in manuals of several different organizations.
 - Packaging and transportation procedures were not always available and coordinated with all packaging and transportation organizations.
 - This Concern was addressed in the PT TSA.

CONCERN: Operating procedures for packaging and transporting hazardous
(PT.6-1) materials and radioactive and mixed wastes are not properly
(H2/C2) implemented and not uniform among organizational units.

- FINDINGS:**
- Radioactive and mixed waste must be stored onsite because an approved offsite disposal facility is not available. Such onsite storage could result in packaging and storage problems.
 - See Concern AX.3-1.
 - This Concern was addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, does not have access
(PT.6-2) to an approved offsite disposal area for radioactive and mixed
(H2/C2) wastes.

PT.8 ONSITE TRANSFERS

PERFORMANCE OBJECTIVE: Onsite transfers of hazardous materials should be conducted in a safe, consistent, and accountable manner, following approved procedures, in conformance with applicable standards and accepted safety practices.

- FINDINGS:**
- SNL, Albuquerque, has developed a manual for onsite transportation of hazardous materials.
 - The onsite manual is not a controlled document, and is not distributed and used.
 - A revised onsite manual, Chapter 12 in the new ES&H Manual, is to be effective June 1, 1991.
 - Procedures for onsite transportation of hazardous materials have not been implemented.
 - This Concern was addressed in the PTTSA.

CONCERN: Onsite transportation of hazardous materials is not being
(PT.8-1) controlled in accordance with the Sandia National Laboratories
(H3/C2) Onsite Transportation Manual.

PT.11 APPRAISALS AND INTERNAL AUDITS

PERFORMANCE OBJECTIVE: Periodic PT safety appraisals of contractors by the Field Office, and independent internal PT safety audits by each contractor, as required by DOE 5480.3, are conducted in accordance with DOE 5482.1B.

- FINDINGS:**
- Safety appraisals were conducted by AL.
 - There were no independent internal safety appraisals of packaging and transportation activities by SNL, Albuquerque.
 - There was no SNL, Albuquerque, schedule for safety appraisals.
 - See Concerns QV.1-3, QV. 1-4 and FR.1-2.
 - This Concern was addressed in the PTTSA.

CONCERN: There were no independent internal safety appraisals of packaging
(PT.11-1) and transportation made by Sandia National Laboratories,
(H3/C1) Albuquerque, as required by DOE 5480.3.

4.5.10 Nuclear Criticality Safety

4.5.10.1 Overview

This appraisal addressed all five performance objectives of the Nuclear Criticality Safety functional area. The appraisal was accomplished by means of interviews with persons concerned with nuclear criticality safety issues at SNL, Albuquerque; by review of numerous documents; and inspection tours of areas affected by nuclear criticality safety. The areas toured were the Hot Cell facility (including room 108--the main special nuclear materials (SNM) storage area at Technical Area V), the emergency control room in Bldg. 6577, and the SNM storage areas at the SPR and ACRR facilities, and the Manzano Area.

In the area of organization and administration it was found that the necessary elements are in place and documented, and necessary functions are being performed. Personnel qualifications are exemplary. In this area, it should be noted that there are two nuclear criticality safety review committees at SNL, Albuquerque. The Technical Area V Radiological and Criticality Safety Committee (RCSC) has 12 members, only three of whom have line responsibilities. The RCSC is active, having held 23 meetings during the last year. The Sandia Radiological and Criticality Safety Committee (SRCSC) reviews the activities of the RCSC, and performs other functions as well. The SRCSC meets several times per year. Both committees have effective action item tracking systems, and the distribution of the meeting minutes is appropriate. The functioning of the field office is also reviewed in this area. Three concerns are expressed here.

In the area of use of nuclear criticality safety control parameters it was found that essentially every operation with fissile materials is reviewed for safety by the RCSC prior to authorization or implementation. Operations of any significant complexity are subjected to comprehensive nuclear criticality safety analysis. Criticality guidance is then formulated based on the results of the analyses. No concerns are expressed in this area.

Nuclear criticality safety evaluations are conducted for planned or proposed operations as already mentioned. Some shortcomings are noted here. Also addressed in this area is the issue of safety analyses, and it was noted that the existing Hot Cell facility and the ACRR SARs do not sufficiently address nuclear criticality safety. Further, there is no safety analysis for the fissile material storage areas associated with the SPR and ACRR facilities. It is planned to produce an improved SAR for the Hot Cell facility and the ACRR facility wherein nuclear criticality safety will be addressed in more detail. Personnel at Technical Area V propose to apply a new four-step "Risk Management Program" to the fissile material storage areas mentioned. Three concerns are expressed in this area.

Operating procedures and criticality safety limits were seen generally to be well conceived and executed. A few deficiencies in mass limit postings led to the expression of one concern in this area.

In the area of criticality alarm system and emergency procedures it was determined that criticality alarm systems were provided in the Hot Cell facility and in the SPR facility. The SPR facility criticality alarm system

is a portable unit. The alarm system audibility has been tested and the criticality alarm systems are tested on a defined schedule. Fixed and personnel nuclear accident dosimeters are provided. Technical Area V has a well-documented emergency procedure, and exercises and drills are conducted on an appropriate schedule. Evacuation routes are well-marked. Three concerns are expressed in this area.

SAND90-2827, "Pre-Tiger Team Self-Assessment Report," January 1991, contains seven concerns (referred to as "Findings") in the area of nuclear criticality safety. These concerns were generated from the response to questionnaires circulated in October 1990. The responses to the questions were largely "yes" or "no" and, in some cases, resulted in a misrepresentation of prevailing conditions. The concerns as expressed, except for Finding SF-CS-07, tended to be global and of marginal use in narrowing down deficiencies. The AL Self-Assessment and KAO Self-Assessment did not address nuclear criticality safety.

Overall, the SNL, Albuquerque, nuclear criticality safety program was seen to be of high quality. It exhibits dedication to compliance with requirements, with relevant activities carried out at a high level of professionalism. The deficiencies noted here are readily correctable.

4.5.10.2 Findings and Concerns

CS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: All operations with fissionable material should be conducted to provide effective nuclear criticality control during all activities.

- FINDINGS:**
- The "ACRR Procedure Instruction," February 28, 1990, requires that procedures be reviewed by the Sandia Reactor Safety Committee and the ACRR Safety Committee. It requires approval by the responsible Division Supervisor.
 - The "ACRR Instruction," March 30, 1990, does not require committee review of instructions and requires approval only by the Supervisor, Reactor Applications Division. Regardless of this, those instructions with nuclear criticality safety implications are usually reviewed by the Technical Area V RCSC.
 - Neither instruction requires review by the Technical Area V RCSC, but such review is sometimes needed.
 - The "Criticality Safety Analysis for ACRR SNM Storage" was intended to be reviewed by the RCSC but was not. It was approved and implemented without RCSC review.
 - Although DOE 5480.5, Sec. 9h(2), requires that proposed experiments and operations having safety significance receive objective and independent review, the document, GN470000 Issue C "Generic Standard Operating Procedure," April 8, 1991, p. 15, does not require QA review or approval of major documents.
 - This Concern was not addressed in the PTSA.

CONCERN:
(CS.1-1)
(H2/C1)

The Sandia National Laboratories, Albuquerque, Nuclear Criticality Safety Program does not include the independent review to meet all requirements of DOE 5480.5, Section 9h(2).

- FINDINGS:**
- Neither DOE 5480.5, Sec. 7e(9), AL 5480.5, nor DOE 5482.1B specify the frequency of field organization appraisals of nuclear facilities. The last two appraisals conducted by AL were in April 1988 and December 1990. The interval between these two appraisals is about 31 months.
 - This Concern was not addressed in the AL Self-Assessment.

CONCERN:
(CS.1-2)
(H2/C2)

The Albuquerque Operations Office does not perform frequent appraisals of nuclear criticality safety. (See Concern QV.1-4.)

FINDINGS:

- KAO neither receives nor distributes Unusual Occurrence Report (UOR) notices nor TSA Noteworthy Practices.
- Personnel at SNL, Albuquerque, sometimes receive UOR notices and TSA Noteworthy Practices, but employees at the working level see these only infrequently.
- This Concern was not addressed in the PT TSA.

CONCERN:
(CS.1-3)
(H2/C2)

Sandia National Laboratories, Albuquerque, personnel do not regularly receive Technical Safety Appraisal Noteworthy Practices or Unusual Occurrence Report Notices. (See Concern OA.1-5.)

CS.3 NUCLEAR CRITICALITY SAFETY EVALUATIONS

PERFORMANCE OBJECTIVE: Nuclear criticality safety evaluations of the design and operation of process equipment should ensure that subcriticality is maintained under normal and credible abnormal operating conditions.

- FINDINGS:**
- Nuclear criticality safety is not sufficiently addressed in the current Hot Cell facility SAR or in the ACRR SAR.
 - Updated versions of the Hot Cell facility SAR and the ACRR SAR are in preparation.
 - DOE 5480.5, Sec. 8a, requires conduct of a safety analysis and DOE 5480.6, Sec. 8h, states that for fissile material storage and handling facilities and operations located within a reactor facility, the requirements of DOE 5480.5 shall be applied as appropriate [emphasis added].
 - Although storage of experiments containing high radiation levels or SNM at Technical Area V are evaluated for nuclear criticality safety and reviewed by the Technical Area V RCSC, Technical Area V personnel contend that no safety analysis (as defined in DOE 5480.5) is required for the reactor storage areas.
 - Recommendation S-NSF-90-6 in the "Nuclear Facility Safety Appraisal of the Hot Cell Facility, Bldg. 6580, Sandia National Laboratories, Albuquerque, December 3-13, 1990," calls for preparation of safety analysis documentation of radioactive material storage facilities within Technical Area V. A response is required during June 1991.
 - This Concern was not addressed in the PT TSA.

CONCERN: Safety analyses have not been performed for fissile material
(CS.3-1) storage areas at Technical Area V nor has the requirement been
(H2/C1) analyzed, as required by DOE 5481.1B. (See Concern AX.4-2.)

- FINDINGS:**
- A table of threshold mass limits is presented on p. 14D-1 of MN471001, the new ES&H Manual, February 28, 1991. These mass limits are derived from Table 1 of ANSI/ANS-8.1-1983, and do not allow for contingencies such as double batching or failure of analytical techniques to yield accurate values.
 - This Concern was not addressed in the PT TSA.

CONCERN: The Nuclear Criticality Safety Program at Sandia National
(CS.3-2) Laboratories, Albuquerque, does not provide evidence that the
(H1/C2) threshold mass limits are safe against credible contingencies.

- FINDINGS:**
- Although input to nuclear criticality safety analyses may be checked, there is no SNL, Albuquerque, requirement to do so.

- No central file of nuclear criticality safety analyses is maintained.
- This Concern was partially addressed in the PTTSA.

**CONCERN:
(CS.3-3)
(H2/C2)**

Sandia National Laboratories, Albuquerque, has no requirement to check input to nuclear criticality safety analyses, and no central file of nuclear criticality safety analyses is maintained.

CS.4 OPERATING PROCEDURES AND CRITICALITY SAFETY LIMITS

PERFORMANCE OBJECTIVE: The approved written operating procedures should address criticality safety limits in providing effective guidance for all aspects of facility activities.

- FINDINGS:**
- The fissile materials mass limit postings at SPR II and SPR III X vaults are obsolete.
 - Although mass limit postings are provided on the north wall of Manzano Area Structure 37063, they are not provided on the south wall. They are not posted at all in Structures 37055 and 37057.
 - This Concern was not addressed in the PTTSA.

CONCERN: Posting of fissile materials storage limits at Sandia National
(CS.4-1) Laboratories, Albuquerque, does not, in all cases, meet the
(H2/C1) requirements of DOE 5480.5, Section 13b(4).

CS.5 CRITICALITY ALARM SYSTEM AND EMERGENCY PROCEDURES

PERFORMANCE OBJECTIVE: All reasonable steps should be taken to mitigate the consequences of a nuclear criticality accident.

- FINDINGS:**
- The portable criticality alarm system used at the Hot Cell facility does not require concurrent response of two or more detectors to initiate an alarm.
 - The same situation pertains when the portable criticality alarm system is used at the SPR facility.
 - ANSI/ANS-8.3-1986 requires consideration of avoidance of false alarms, and permits minimization of false alarms to be achieved by concurrent response of two or more detectors or use of reliable single detector channels. SNL, Albuquerque, personnel assert that this requirement is achieved because their detector channels are reliable.
 - Since installation in mid-1988, the two portable instruments have produced one false alarm, and the fixed instruments (same design as the portables) have experienced one "fail-mode." The fail-mode would have initiated an alarm in a portable criticality alarm system.
 - Commercial units (Nuclear Measurements Corporation, Models GA2T or GA2T0) were modified to comply with the other requirements of ANSI/ANS-8.3-1986. The modifications are not formally documented.
 - This Concern was not addressed in the PT TSA.

CONCERN: The criticality alarm systems at Sandia National Laboratories, Albuquerque, do not satisfy all generally accepted elements of good industry practice.
(CS.5-1)
(H2/C2)

- FINDINGS:**
- SNL, Albuquerque, has no documented instructions on how to provide immediate response to a mass limit violation.
 - Many of the containers at Manzano Area Structures 37055, 37057, and 37063 are not provided with clear information as to the form or mass of their contents. Further information is not provided at a more convenient, local station. (This information is available from the Material Systems and Security Audits Division, Org. 3442.)
 - In the event of a fire at any of the Manzano Area structures, the Fire Department will not engage in any fire fighting until SNL, Albuquerque, personnel, including personnel from Division 3442, have arrived at the scene. The emergency would then be handled on an ad hoc basis.
 - This Concern was not addressed in the PT TSA.

CONCERN:
(CS.5-2)
(H2/C1)

The emergency response planning provisions of the Sandia National Laboratories, Albuquerque, Nuclear Criticality Safety Program do not satisfy some requirements of DOE 5480.5, Section 8k. (See Concerns EP.2-1 and FP.6-1.)

FINDINGS:

- The absence of a fixed criticality alarm system at the SPR facility has been recognized and accepted in the course of AL appraisals, but application for a variance has not been made.
- AL has directed that a formal analysis be prepared by SNL, Albuquerque, to support a request for a variance that would eliminate the requirement for a fixed criticality alarm system at SPR.
- This Concern was not addressed in the AL Self-Assessment.

CONCERN:
(CS.5-3)
(H2/C1)

The Albuquerque Operations Office has not enforced provision of a criticality alarm system at Sandia Pulsed Reactor, as required by DOE 5480.5, Sections 11c(3)(g) and 11c(3)(h).

4.5.11 Security/Safety Interface

4.5.11.1 Overview

The appraisal of the Security/Safety Interface technical area addressed all four performance objectives. Areas and sites visited included the Manzano Area, the Central Training Academy (CTA), Technical Area V (including the ACRR and SPR facilities, the Emergency Assembly Building, and Perimeter Access Building), Technical Area III, and Technical Area I (including the Emergency Operations Center and the MDL). SNL, Albuquerque, organizations and functions interviewed included Security, Health Physics, Safety, Emergency Preparedness, and Facilities Engineering. Kirtland Air Force Base Security, AL Security, and DOE Transportation Safeguards Division personnel were also interviewed. Documents reviewed included security training plans, protective force orders, emergency plans, the SPR SAR, the CTA Live Fire Range Risk Analysis Report, SNL, Albuquerque-Kirtland Air Force Base agreements, and Facilities Engineering files.

Designs for new facilities and modifications for security/safeguards purposes receive the same reviews, approvals, and treatment as other modifications. The process makes no distinction between types of projects and all types receive the same safety, security, and other reviews and approvals. There is also a change control process. However, review by appropriate organizations of lower cost projects (less than \$150,000) and of design changes, judged to be minor, is not ensured. There is a mechanism for resolving comments and conflicts. Records of reviews are documented and retained in project files.

Access to, and egress from, the Technical Areas and individual facilities are preplanned for site personnel and emergency staff and equipment. Access and egress during emergencies are controlled by security forces, which have roles that are clearly defined in the emergency plans and Operational Security Systems Department Orders. However, a few inconsistencies and omissions were identified in these Orders. Emergency egress is unimpeded or conducted according to preplanning. Holding areas are generally based upon sheltering or accountability considerations, rather than confinement for security purposes. Safety is stated to have a high priority in security-related matters, and information obtained from interviews, document reviews, and observation of egress provisions indicates that this is, indeed, the case. In places where electrically operated gates are used, there are either manual overrides or nearby manual gates that can be used in case of power loss. All enclosed areas have some exits through which egress can be achieved promptly via mechanically operated gates or doors.

Emergency drills include security involvement. Security forces, which are on duty at all times, play a significant role in the on-scene management of emergencies. Separate security drills are held, with each shift crew conducting at least one drill of some type each month. Pre-exercise meetings are held, and documented post-exercise critiques are also held. A safety engineer assigned to support security forces participates in the exercise planning and, as appropriate, is an observer and a participant in the briefings and critiques.

Analyses of hazards associated with security force activities in facilities that contain special nuclear material (SNM) have been performed as a part of the Master Safeguards and Security Agreement. However, similar analyses have

not been performed for other SNL, Albuquerque, facilities. Consequently, facility-specific hazard training is not being performed for all facilities. Security forces do receive general training in radiation safety, hazardous materials, and other safety areas, and also receive extensive training in the safe use and handling of weapons. Safety is emphasized both in written material and in oral instructions in security force training, and personnel are closely monitored during training involving use of weapons. Personnel protective equipment, such as self-contained breathing apparatus and individually-fitted gas masks, is provided to security force personnel who might be placed in a situation where such equipment may be needed. The personnel are trained in the use of this equipment in one of the standard training blocks.

Overall, the security/safety interface at SNL, Albuquerque, was found to be satisfactory. The SNL, Albuquerque, security forces are staffed with well trained and capable personnel. Emphasis on safety and safety training were generally found to be very good, although some facility-specific analyses and training for security/safety interactions remain to be done. The role of security forces in emergency situations, and definition of that role, were good in most respects. Satisfactory relationships have been established with interfacing agencies, including the CTA and Kirtland Air Force Base Security. Deficiencies were identified in the review process for facility modifications but these are generally applicable to modifications of all kinds, and not specific to security-related modifications. Six concerns, in the areas of facility modification review, Security Operations Orders, interaction with Health Physics, and facility-specific safety evaluations and training, were identified. The PTTSA was not very effective in the Security/Safety Interface technical area; fully addressing two of these concerns, but not addressing the other four.

4.5.11.2 Findings and Concerns

SS.1 SAFETY OF IMPROVEMENTS

PERFORMANCE OBJECTIVE: Security/safeguards improvements and modifications should not create or increase hazards that would impede the safe, reliable operation or shutdown of any facility on the site in normal, abnormal, or emergency situations.

- FINDINGS:**
- The design review process for security and other modifications, as described in Items 13-16 of the Facilities Engineering Design Manual (issued June 2, 1986, with subsequent revisions), specifies review at the Title I, Title II, and Title III design stages by a number of organizations. These include Security and ES&H. There is a formal review process for the modifications. However, Facilities Engineering Department staff members, including the Department Manager, stated that this process applies only to modifications costing in excess of \$150,000.
 - No internal SNL, Albuquerque, documentation of the basis for the \$150,000 cutoff for the formal review process was provided. The rationale, as explained by the Facilities Engineering staff, was that AL-4700.1, "Project Management System," which requires a formal project management plan, is applicable only to projects costing \$150,000 or more.
 - For all projects, there is an initial identification of safety and security requirements as part of the Request for Facility Support. For projects costing less than \$150,000, the review process is not formalized, and can depend upon the judgment of the Project Engineer. There is no documented guidance for such judgments. Thus, review by appropriate organizations, including Security and ES&H, is not ensured.
 - See Concerns OS.2-5, TS.3-2, FP.7-1, and FR.3-1.
 - The following Concern was addressed in the PT TSA.

CONCERN:
(SS.1-1)
(H2/C2)

The Sandia National Laboratories, Albuquerque, review system for facility modifications, including security modifications, does not ensure review by all affected organizations for modifications costing less than \$150,000.

- FINDINGS:**
- A Facilities Engineering Quality Control Record Sign-Off Sheet Status Log is used to record the status of project design reviews by the various reviewing organizations, which include the Operational Security Systems Department, using organization, and ES&H, among others. The log sheets cover reviews of the conceptual design, design criteria, Title I and Title II designs, and change orders.
 - For change orders, the sheets have a parenthetical statement: "Major--Review with Division Supervisor." Facilities Engineering Department staff members were uncertain what this

statement meant in terms of requiring review of design changes considered to be minor. However, they conceded a definite possibility that changes considered to be minor by the Project Engineer would not be submitted for review.

- During interviews with Facilities Engineering staff, no guidance or criteria were identified that would assist the Project Engineer in deciding the importance of the change.
- See Concern TS.3-2.
- The following Concern was addressed in the PTTSA.

CONCERN:
(SS.1-2)
(H2/C2)

The Sandia National Laboratories, Albuquerque, change control process does not ensure that design changes are appropriately reviewed by all affected organizations.

SS.2 EMERGENCY ACCESS AND EGRESS

PERFORMANCE OBJECTIVE: Authorized facility and safety support personnel should not be denied access in an emergency. Egress during emergencies should be conducted according to approved preplanning.

- FINDINGS:**
- Several Operational Security Systems Department Orders address emergency vehicle access and egress. These Orders, however, are not entirely consistent with one another with respect to emergency vehicle access and egress. For example:
 - The General Gate Orders permit fire trucks, Albuquerque Ambulance Services ambulances, Kirtland Air Force Base ambulances, and other emergency vehicles to enter areas without inspection or delay during emergencies. A recent revision also permits exiting of emergency vehicles without search during an emergency if the vehicle has been under continuous escort or surveillance, and there is an urgent reason for the vehicle to leave (e.g., ambulance transporting patients, or firefighting apparatus changing response location).
 - Special Gate Orders No. 5, "Tech Area V, C-5," in par. III.A.13, "Emergency Vehicles," addresses entry of fire trucks, but does not address entry of other types of emergency vehicles. Par. III.A.21 specifies that no vehicles will be permitted to exit until they have been searched and monitored for radioactive material. Par. IV.C.4 specifies that all authorized vehicles entering Technical Area V will be thoroughly searched prior to being allowed entry.
 - Special Orders No. 44, "Area 5 Emergency Evacuation Alarm Response and Tech Area 3/5 Area Emergency Evacuation Procedures," in par. III.A.2, states that the Fire Department is authorized unrestricted access to fight fires in the areas designated on the Emergency Supervisor map, but makes no mention of other types of emergency vehicles. Par. III.C.1 directs the C-5 Bravo Security Inspector to provide emergency vehicle access/egress, but does not identify the types of vehicles or access/egress requirements.

- With several Orders giving different direction to the Security Inspectors and senior protective force staff, it is not certain which direction will be followed. This could result in unnecessary delays in the response of emergency vehicles.
- The following Concern was not addressed in the PTTSA.

CONCERN:
(SS.2-1)
(H2/C2)

The Sandia National Laboratories, Albuquerque, Operational Security Systems Department Orders do not ensure unimpeded access and/or egress for all types of emergency vehicles when required.

FINDINGS:

- SNL, Albuquerque, Operational Security Systems Department Special Orders No. 44, "Area 5 Emergency Evacuation Alarm Response and Tech Area 3/5 Area Emergency Evacuation Procedures," in par. III.I.1.b, directs the Security Inspector at the Bldg. 6593 Hardened Auxiliary Reactor Portal Operations to evacuate to a safe area if the Security-issued RAD-85 monitor alarms or shows a reading of 0.100 rem or more. A memorandum (S. Ortega to R. Stump and G. Arellano, dated April 3, 1991, "Security Evacuation Procedure Tech Area V") proposed adding a provision that the position also be secured if the wall mounted gamma radiation monitor near the security post alarms for greater than 20 seconds. Another memorandum (S. Ortega to R. Stump, G. Arellano, and J. Larson, dated April 22, 1991, "Security Evacuation Procedures, Tech Area V") proposes yet another change in the response to the alarms.
- During the aborted emergency exercise at Technical Area V on April 18, 1991, it was observed that the gate on the inner fence of the double fence behind the Emergency Assembly Building was secured with both a security forces padlock and a Health Physics Division combination padlock. The locks were arranged such that both would have to be removed for the gate to be opened. The stated purpose of the Health Physics Division lock was to prevent access by anyone, including security forces, to the area between the inner and outer fences when the SPR is being operated in the open beam mode. The intent is to prevent people from entering the beam area behind the SPR. However, the SPR was not being operated in open beam mode at the time. HP-S-001, "Sandia Pulse Reactor Health Physics Pre-Operational Checkout Procedure," September 25, 1989, does not address placement or removal of the Health Physics Department locks on the Technical Area V double fences. From discussions with Health Physics Division staff, doses to persons between the inner and outer fences behind the SPR during open beam operations might be on the order of a few hundred mrem to a few rem, but the magnitude of the risk is not fully defined at this time.
- At a Patrol Force South shift briefing on April 18, 1991, one of the Security Inspectors commented that a Health Physics

Division lock had been placed on one point of entry to an area at Bldg. 6596, presumably to prevent entry to an area of radiological concern. However, as the Inspector stated, there are three other points of entry into the area that were not secured by Health Physics Division locks.

- The following Concern was not addressed in the PTTSA.

CONCERN:
(SS.2-2)
(H2/C2)

Radiological controls in Technical Area V are not fully coordinated with the security forces to ensure a proper balance between radiological safety and security.

SS.3**FACILITY PLANNING FOR SECURITY/SAFEGUARDS EMERGENCIES**

PERFORMANCE OBJECTIVE: Safety authorities and responsibilities for all types of security/safeguards emergencies should be well defined and understood by all involved parties.

- FINDINGS:**
- A systematic analysis of the potential effects of security force actions on SNM operations was performed as a part of the Master Safeguards and Security Agreement (which includes vulnerability analyses). No significant hazards were identified. This analysis relates primarily to certain facilities in Technical Area V.
 - Similar analyses have not been performed for SNL, Albuquerque, facilities other than those that contain SNM. Such analyses are scheduled to begin in May 1991.
 - See Concern SS.4-1.
 - The following Concern was not addressed in the PT TSA.

CONCERN:
(SS.3-1)
(H2/C2)

Analyses of the consequences of using weapons and other protective force equipment in the vicinity of safeguarded components and systems, and hazardous materials and processes, have not been performed for all Sandia National Laboratories, Albuquerque, facilities.

SS.4 SAFETY OF SECURITY ACTIVITIES

PERFORMANCE OBJECTIVE: Safety aspects of security activities involving use of weapons and other protective force equipment in the vicinity of safety systems and/or hazardous processes and material should be identified and understood by all involved parties.

- FINDINGS:**
- Security forces receive general training in radiation safety, hazardous materials, and other safety-related matters, and in recognizing the hazards postings used at the SNL, Albuquerque, facilities.
 - Facility-specific hazard training concerning the hazards of using weapons and other protective force equipment in and around individual facilities cannot be provided, in many cases, because the hazards associated with security force activities within the facilities have not been analyzed systematically. (See Concern SS.3-1.)
 - See Concerns SS.3-1 and TC.4-2.
 - The following Concern was not addressed in the PTTSA.

CONCERN:
(SS.4-1)
(H2/C1)

Security forces personnel have not received facility-specific training on the potential consequences of using weapons and other protective force equipment in the vicinity of hazardous materials and processes at all Sandia National Laboratories, Albuquerque, facilities, as required by DOE 5480.16, Chapter I, paragraph 2.c.8.

4.5.12 Experimental Activities

4.5.12.1 Overview

This appraisal of the Experimental Activities at SNL encompassed facilities at the Albuquerque site. These facilities were chosen because of their contribution to the fulfillment of the SNL, Albuquerque, mission as well as the complexity and hazard potential of the experiments conducted. These facilities include the PBFA II facility, Bldg. 983; Simulation Technology area; SPR facility, Bldg. 6590; ACRR, Bldg. 6588; Aerodynamic Wind Tunnel Facility, Bldg. 865; Light Initiated High Explosive Facility, Bldg. 6715; Hot Cell Facility, Bldg. 6580; GIF, Bldg. 6588; Sled Track Facility, Bldg. 6741; and the National Solar Thermal Test Facility Bldgs. 9980, 9981, 9981A, and 9984.

This appraisal addressed all four of the performance objectives of the Experimental Activities technical area. Staff were interviewed to ascertain how experiments were conducted and controlled. Facilities in which experiments were conducted were inspected; logs, records, and procedures were examined; and policy and practices were reviewed.

The performance of experiments was generally accomplished in a professional but informal manner. The laboratory personnel exhibited enthusiasm in their work and demonstrated a desire to improve the operation and safety of the experimental activities.

Experiments are reviewed for safety and approval at the facility level prior to performance. These reviews, depending on the complexity, history, and hazards of the experiments, range from an informal review by the facility operator to a formal review by several safety committees in series. The membership mix on some safety committees is such that they cannot fulfill the requirements for an independent review of experiments. The formality and rigor of the review provided experiments is primarily dependent on the formality of operations at the facility in which the experiment is conducted. SNL, Albuquerque, has not implemented an experimental activities review and approval policy/process which is responsive to the safety needs of the facilities, and which complies with the applicable DOE Orders.

The timeliness of responses and the approach to implementation of safety-related requirements by the safety committees and ES&H indicates that SNL, Albuquerque, has not implemented a disciplined, safety-oriented approach to the review of experimental activities.

The PTTSA focused on the formality and independence of the review to which proposed experiments were subjected and the structure of the review process. The relationship between the facility operator and the experimenter was not addressed, nor was the interrelationship of facility operating practices and the experimenter's needs explored. However, despite the lack of detail at the experimenter/operator interface, the self-assessment has captured the majority of significant issues needing management attention at SNL, Albuquerque.

The program governing the conduct of experiments, in general, lacks formality and discipline and is not in compliance with DOE requirements. The experimental activities conducted at SNL, Albuquerque, vary greatly in formality of both the review and the performance of experiments.

4.5.12.2 Findings and Concerns

EA.1 INTERFACE WITH EXPERIMENTERS

PERFORMANCE OBJECTIVE: Persons planning or conducting experiments in, or with, the facility should have their relationship to the operating group clearly defined.

- FINDINGS:**
- The responsibilities and authorities, associated with experimental activities, for each position within the facility operating organizations are not defined, and are promulgated in an informal and essentially verbal manner, for most facilities.
 - Generally there are no documented guidelines that define the responsibilities and relationships of personnel involved in experimental activities.
 - This Concern was not addressed in the PT TSA.

CONCERN:
(EA.1-2)
(H3/C1)

Persons planning or conducting experiments do not have their responsibilities and authorities clearly defined with respect to interfaces with the facility operations group, as required by DOE Order 5480.19. (See Concerns OA.1-4, OP.1-3, MA.1-2, and TS.1-2.)

EA.2

EXPERIMENT CATEGORIES

PERFORMANCE OBJECTIVE: All proposed experiments should be approved by an independent Safety Review Committee before they are performed.

- FINDINGS:**
- A formal procedure to determine the extent of review required for experiments does not exist for all facilities.
 - In several facilities, there is no formal process by which the experimenter is notified that an experiment has been approved for performance.
 - The Troll is in operation generating high levels of radiation; however, the Standard Operating Procedures being used, SP471183, "Standard Operating Procedure for the Troll," has not been reviewed and approved by Health Physics.
 - PBFA II does not have a specific formal process for reviewing and approving experiments.
 - Several facilities do not have a formal review and approval process for experiments.
 - The GIF operator in conjunction with the experimenter prepares a GIF Experiment Plan.
 - The GIF operator and the division supervisor determine if further review of the experiment is needed. This is an informal process for which there is no specific guidance or criteria. (See Concern EP.2-5 and TS.2-1.)
 - The ES&H personnel providing technical support to the MDL staff are, under a documented agreement between MDL and ES&H, also providing independent oversight and review of MDL.
 - This Concern was addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, has not developed and implemented a program which ensures that all experiments are formally reviewed and approved prior to execution, as required by DOE 5481.1B, DOE 5480.5, DOE 5480.6, and DOE 5482.1B. (See Concerns FR.1-1, FR.3-1, OA.2-2, and TS.2-1.)

- FINDINGS:**
- The membership and quorum requirements of the Technical Area V RCSC, Sandia Pulsed Reactor Committee, Annular Core Research Reactor Committee and the Sandia Reactor Safety Committee are such that at any given meeting the committees may not provide an independent safety review.
 - The June 1986 AL audit of ACRR also had this same finding.
 - This Concern was addressed in the PT TSA.

CONCERN:
(EA.2-3)
(H2/C1)

The charters and membership makeup of the committees that perform the reviews do not ensure an independent review, as required by DOE 5480.6 and DOE 5480.5. (See Concerns FR.1-1 and OA.2-2.)

EA.3 EXPERIMENT PROPOSALS

PERFORMANCE OBJECTIVE: Sufficient information on a proposed experiment should be submitted to permit a safety evaluation to be made.

- FINDINGS:**
- The Sandia Reactor Safety Committee report documenting the 1990 annual review of the accuracy and completeness of recordkeeping, and documentation has not been prepared.
 - The "Safe Operating Procedure for the Gamma Irradiation Facility" was due for annual review on February 1, 1990. On April 1, 1991, a GIF operator, in a telephone conversation, was advised by an SNL, Albuquerque, ES&H representative that the SOP is valid until informed otherwise by ES&H.
 - The SOP 60029003, "Safe Operating Procedures for the Gamma Irradiation Facility," February 1, 1991, does not contain operating procedures for the GIF, nor does it require they be used in the operation of the GIF or the performance of experiments in the GIF.
 - The charter for the Technical Area V RCSC states, "The division of experiments and operations into experiment classifications is still in development. Until these classifications have been approved for inclusion in this, any activities involving significant quantities of radioactive or Special Nuclear Materials must be reviewed by the Radiological and Criticality Safety Committee." The charter was approved July 14, 1989, some 22 months ago. The term "significant quantities" is subjective and open to wide interpretation.
 - This Concern was addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, has not established an
(EA.3-1) experimental activities process that is responsive to the safety
(H2/C1) needs of the facilities, as required by DOE 5480.5, DOE 5480.6
and DOE 5482.1B. (See Concern FR.3-1.)

EA.4 OPERATION OF EXPERIMENTS

PERFORMANCE OBJECTIVE: Experiments performed in any facility on the site should not present undue risk or significantly increase the risk previously evaluated for the facility or the site.

- FINDINGS:**
- Formality of experiment plans varies greatly depending on the facility and the nature, size, and hazards associated with an experiment.
 - Some facilities have handwritten experiment plans that are very informal in nature.
 - In many instances, determination of whether the risks associated with an activity are outside the normal operating envelope, and would require an independent review or supplemental SOP, resides primarily with the designer of the experiment.
 - There is a strong correlation between the formality of operations at a facility and the formality and depth of review of experiments. (See Concern OP.3-9.)
 - Some experiments are performed with approved procedures; however, the procedures do not always include action to be taken in the event of abnormal conditions. (See Concern EP.2-5.)
 - This Concern was addressed in the PTTSA.

CONCERN:
(EA.4-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, does not have a program to ensure that experimental activities are performed with the appropriate level of formality, and are performed without increasing the risks previously evaluated for the facility or site, as required by DOE 5480.19. (See Concern FR.3-1.)

4.5.13 Site/Facility Safety Review

4.5.13.1 Overview

All six performance objectives for the Site and Facility Safety Review functional area were addressed during this appraisal. The appraisal was conducted by reviewing documentation relating to organization and implementation of the independent review and appraisal system, and by interviewing line management, ES&H staff, safety committee chairpersons, facility personnel, ES&H coordinators, and organizations responsible for regulatory and appraisal activities.

Among the many documents reviewed were policy, appraisal program, all of the major safety committee charters, safety committees' minutes, department mission documents, conduct of operations documents, self-assessment documents, documents at each facility visited, and other documents relating to the ES&H program. Numerous facilities were toured, including the Simulation Technology Laboratory, Hermes III, Proto II, SABRE, Particle Beam Fusion Accelerator II, Gas Gun Facility, Explosives Projects and Diagnostic Facility, Sled Track Facility, and the Microelectronic Development Laboratory.

The ES&H appraisal program at SNL, Albuquerque, has been elaborately documented with clear lines of authority and responsibility. A layered appraisal system covers appraisals and reviews by all levels of management and supervision, as well as provides for independent appraisals of the internal safety review system. While the ES&H program has been developed, documented and issued, there are some areas that affect the Independent Safety Review and Appraisal System that need attention. The lack of an institutional plan for implementing the DOE requirements relating to internal review and appraisals has affected the overall review system, including makeup of safety committees and the operation, effectiveness, and efficiency of these committees. With the advent of the newly developed ES&H appraisal program, this is an opportunity to encompass all operations under the master plan, which should enhance safety of all facilities, including reactor and nuclear facilities.

Based on this review, improvement can be made by giving more attention to safety committee charters, safety review system structure, and operation of the committees. Facility personnel have been obtaining reviews on their own because they were needed, not because they were required. Additional formality in the reviews of experiments for smaller facilities will help ensure that multidisciplinary reviews are made of experiments. Some changes in the areas identified above could give a higher degree of safety. In addition, triennial appraisals need more attention, with emphasis on independence and comprehensiveness, to help enhance the overall ES&H program. The review system at facilities which do not have safety committees should be evaluated.

In conclusion, the SNL, Albuquerque, "ES&H Appraisal Program" has been elaborately documented and appears to be all inclusive. However, management had not planned to include appraisals of the reactor and nuclear facilities safety review system in the new "ES&H Appraisal Program." In addition, the ES&H document does not specifically cover the structure and operation of the SNL, Albuquerque, facility safety review system, which could result in continuation of a system that does not provide guidance for facility safety reviews, as required by DOE Orders. With establishment and implementation of

a structured internal review system as a part of the overall ES&H program now in effect, the deficiencies identified in this report should be corrected. The PTSA report addressed all of the areas of concern covered in this report.

4.5.13.2 Findings and Concerns

FR.1 SAFETY REVIEW COMMITTEE

PERFORMANCE OBJECTIVE: A Safety Review Committee should be available to review safety questions and the safety impacts of experiments. This committee is part of the "Contractor Independent Review and Appraisal System" specified in DOE 5480.5, or DOE 5480.6, and/or DOE 5482.1B, Section 9.d.

- FINDINGS:**
- The existing internal safety review system includes the following:
 - Facility safety committees.
 - An undocumented practice by facility managers of getting reviews from specialists within the ES&H Directorate.
 - Six institutional specialty committees, such as electrical, pressure, and explosives, which are primarily working committees and not technical review committees, with the exception of the radiological and criticality committee.
 - Newly formed independent assessment organization, the Regulatory Assessment Division.
 - The management appraisals performed by the Director of Quality Improvement.
 - Some of the above safety committee charters do not have quorum requirements, and management sometimes directs the chairman to appoint the other members of a committee.
 - Except for facilities that have advisory safety committees, none of the facility people interviewed use the specialty committees. The charters of these specialty committees do not make it clear that they are primarily working committees.
 - Written policy and procedures at the institutional level have been issued, but not fully implemented, which identify the type of reviews required for each level of hazard.
 - Even though lasers are used extensively, an institutional laser committee has not been established, as recommended by ANSI Z136.1-1986, Appendix D3.
 - An SNL, Albuquerque, plan has not been established at the institutional level to ensure that the newly created independent appraisal system encompasses the reactor safety review system.
 - These Concerns were partially addressed in the PTSA.

CONCERN:
(FR.1-1)
(H2/C1)

There is no formal sitewide policy and requirements that cover the structure and operation of the facility safety review system to ensure consistent, uniform, independent reviews, as required by DOE 5480.1B, DOE 5481.1B, DOE 5480.5 and DOE 5480.6. (See EA.2-2, EA.2-3, EA.3-1, OA.2-2 and PT.11-1.)

CONCERN:
(FR.1-2)
(H2/C1)

The Sandia National Laboratories, Albuquerque, institutional plan has not ensured that the internal, independent safety review system covers all operations, as required by DOE 5480.5, DOE 5480.6 and DOE 5482.1B.

FR.3 OPERATIONS OF SAFETY REVIEW COMMITTEE

PERFORMANCE OBJECTIVE: Review of site/facility activities by the Safety Review Committee should ensure achievement of a high degree of safety.

- FINDINGS:**
- Many operations in the laboratory obtain safety reviews from ES&H staff rather than through a safety committee. Records of reviews sometimes consist only of the reviewer's signature, which appears on a concurrence sheet included with the procedure. No other documentation is made of the review.
 - The effects of facility aging has not been reviewed for all of the facilities onsite involving potentially hazardous operations.
 - Experiment plans and procedures have not been prepared and issued to the Reactor Safety Committee on a timely basis, which has required some members of the Reactor Safety Committee to work overtime, which risks performing hasty reviews to meet the operating schedule.
 - This Concern was partially addressed in the PT TSA.

CONCERN: Reviews of site/facility activities have not been conducted
(FR.3-1) effectively to ensure a high degree of safety. (See Concerns
(H2/C2) EA.3-1, SS.1-1 and EA.2-2.)

FR.5 TRIENNIAL APPRAISAL OF SITE/FACILITY SAFETY REVIEW SYSTEM

PERFORMANCE OBJECTIVE: A triennial appraisal of the safety review system should be performed by contractor management.

- FINDINGS:**
- Triennial appraisals have not been performed for each facility on the SNL, Albuquerque, site. Triennial appraisals have only been conducted on nuclear facilities.
 - Although the required frequency of triennial appraisals of nuclear facilities has been met, the last triennial appraisal was performed by an individual in line management. This compromises independence and objectivity of the review. The content of the last triennial appraisal report of the reactor safety review system was not comprehensive; therefore, its usefulness in aiding improvement of safety was limited.
 - SNL, Albuquerque, indicated that an appraisal was also conducted in 1988. However, the one and one-fourth page memorandum, dated July 7, 1988, addressed to "Sandia Reactor Safety Committee File" does not meet the requirements of DOE 5480.5, DOE 5480.6 or DOE 5482.1B as a triennial appraisal.
 - PY471000, "ES&H Policy, Requirements and Responsibilities Program," December 17, 1990, identifies that the President, SNL, Albuquerque, is responsible for performing independent appraisals.
 - This Concern was addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, performance of triennial appraisals has not satisfied all of the requirements of DOE 5480.5, DOE 5480.6 and DOE 5482.1B.
(FR.5-2)
(H2/C1)

4.5.14 Radiological Protection

4.5.14.1 Overview

Radiological Protection at SNL, Albuquerque, was evaluated against all 12 performance objectives. There were concerns in all areas appraised. The appraisal was performed by a team of three Health Physicists by reviewing documents, inspecting facilities, and interviewing staff in both the line organizations and in the safety disciplines. In addition, a limited number of measurements were made using SNL, Albuquerque, portable radiation protection instruments.

The Health Physics Division and Health Instruments Division are two divisions within the Health and Safety Department. They are staffed primarily by people with considerable experience, most of it at SNL. In the Health Physics Division, there are only eight Health Physics Technicians and eight professionals plus the supervisor. In the Health Instruments Division, there are five technicians and clerks, three programmers, six professionals and a supervisor. Staffing levels impact the rate at which program improvements are being implemented.

Up until a few years ago, radiation protection operated with few procedures and formal systems, but that is in the process of changing. As part of the Laboratory-wide ES&H initiative, a new and more comprehensive ES&H Manual has been prepared (but not yet issued for compliance), and a Radiation Protection Overview Program has been prepared for guidance. The new ES&H Manual will reportedly become effective in June 1991. Not all of the Radiation Protection Overview Program elements are included. There is no implementation schedule for those not included. The elements of the overview program appear to be technically sound, and the technical basis has been documented along with development of the program.

However, in the absence of firm, current guidance, it appears that many managers in the line organization are establishing their own radiation protection policy, and interpreting the DOE Orders rather than relying on the health physics professionals. The result is inconsistent practices and, in some cases, technically flawed internal requirements. Although the new system of Standard Operating Procedures should minimize this diversity and give the professional staff input into the way radiation protection is implemented, this result is not evident. Lack of familiarity with procedures and the line organization preparing implementing procedures that do not include the requirements of the approved Standard Operating Procedures subvert this effort.

SNL, Albuquerque, has known that it operated out of compliance with DOE Orders in radiological protection for many years. Despite this, there has been no analysis of the potential impact on any facility.

SNL, Albuquerque, has not implemented an internal audit program, as required by DOE 5480.11 and DOE 5482.1B. Although it has the beginnings of an effective radiological incident reporting system, it has been implemented only in the reactor area (Technical Area V). Sealed radiation sources are inventoried and the larger ones are checked for leakage. Radiation generating devices are appropriately interlocked and most have been recently surveyed. A radiation work permit system has not yet been implemented.

Most radiation areas, high radiation areas and very high radiation areas are appropriately identified. However, many controlled areas are not yet marked.

The SNL, Albuquerque, Personnel Dosimetry Program has met the requirements for the Department of Energy Laboratory Accreditation Program. However, SNL, Albuquerque, does not have criteria for the assignment of dosimeters, and has not calibrated the self-reading dosimeters that are used for backup. Nuclear accident dosimeters meet the requirements of ANSI N13.3, except that they have not been qualified by exposure to test radiations because DOE has closed the only reactor providing this service.

The internal radiation exposure control program is deficient in that the respiratory protection program does not comply with ANSI Z88.2, and the air monitoring program has not been implemented.

Considerable progress has been made in the area of internal dosimetry, however, the program is not yet fully implemented. It may require expansion beyond that currently planned, based on the results of an ongoing investigation of several cases of low level tritium exposure in the plant protective force.

The plant appears to have an adequate, or nearly adequate, supply of instruments for the current program and the ability to calibrate them effectively. (Program expansion may require additional instrumentation.) Two concerns in the area of instrumentation involved the fact that some locations are without instruments during calibration, and some older remote area monitors are of a design that gives erroneously high readings at background levels. Personnel are not informed that these readings are not accurate.

Although air sampling and monitoring are performed at several potential exposure locations, there is not a documented air monitoring program. In some other locations, the appraisal team identified a potential for airborne activity, but personnel routinely entered and worked without air monitoring.

The two most significant concerns were in the area of contamination control. SNL, Albuquerque, is unable to assure that material released from the site meets the criteria established in DOE 5400.5. Also, there are at least three outdoor locations where contamination levels are sufficient to require posting, control, and egress surveys, but such control is absent. A routine contamination survey program generally covers indoor locations, but survey schedules often slip.

Some HEPA filters are not tested, as required, and some glovebox gloves are patched when they should be replaced. The formal ALARA Program is not yet fully implemented, and the accumulation of unneeded contaminated facilities and radioactive materials was judged to be contrary to the ALARA principle. One factor impacting the cleanup plans is the inability to dispose of radioactive waste. This is directly the result of not having the proper certifications due to an unresolved conflict in requirements. Headquarters, DOE, appears to have the only authority to resolve this issue.

The PTTSA appeared to be an honest and reasonably comprehensive self-assessment, which included 33 findings in radiation protection. It fully addressed 10, and partially addressed three, of the 24 concerns in this appraisal. It agreed with the S&H Subteam observations particularly well in

the areas of inspection and audits, internal and external dosimetry, air monitoring, and ALARA. The areas in which it failed to identify problems involved operating procedures, posting, and contamination control.

The team found no evidence that employees or others onsite were being exposed to more than a small fraction of the allowable radiation limits. While several areas for improvement were noted, a significant effort has been made to increase the rigor and formality of the radiation protection program. While not yet fully implemented, the enhanced program appears to be comprehensive. In the transition period during implementation, facility operations organizations have assumed a much greater role in radiation protection, often with inconsistent results. Full implementation of the program should provide for a comprehensive and consistent radiation protection program.

4.5.14.2 Findings and Concerns

RP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Site/facility organization and administration should ensure effective implementation and control of radiological protection activities on the site/facility.

- FINDINGS:**
- The old ES&H Manual had eight pages devoted to radiation safety. It is being replaced by a new ES&H Manual, MN471001, which has been distributed for information and is scheduled to be implemented June 1, 1991. It has about 37 pages devoted to radiation protection. A new "Sandia National Laboratories, Radiation Protection Overview Program" (Overview Program) has been prepared and approved within the ES&H Directorate. It contains a comprehensive radiation protection program. SNL, Albuquerque, plans to add sections of the Overview Program to the ES&H Manual as implementation is considered feasible and resources are available to support them.
 - Neither the old system of Safe Operating Procedures nor the new system of Standard Operating Procedures, as implemented during the appraisal, effectively promote radiological safety as discussed in the findings supporting Concern RP.3-2.
 - The health physics review and approval of procedures was delaying the implementation of some new procedures (or they were implemented prior to review). There was evidence that some of the reviews were not in sufficient depth to assure the desired margin of safety. (See Concern RP.3-2.)
 - There is considerable diversity in the posting of controlled areas. (See Concern RP.3-4.)
 - During the recent implementation of the space ownership system, the SPR reactor keys were transferred to the owner in the line organization. Shortly thereafter, the two keys were found to be separated, with one key in the operating console and the other used to unlock the gate to the exclusion area for personnel entry. This violated procedures.
 - In some locations, facility users have established technically flawed radiation protection requirements (such as requiring that lunches be enclosed when they are carried through an uncontaminated area where sealed sources are stored in Bldg. 809).
 - There are instances where facility users have established radiation areas, and also marked them indicating far greater radiation and health hazards than those present.
 - Facility decontamination had been performed without health physics coverage or procedures. It was done by personnel

with minimal knowledge of the hazard, or of applicable measurement techniques.

- The procedure for collection, transportation, and storage of radioactive waste, including bags reading up to 200 mrem/hr, was issued without approval of the health physics organization. The procedure contains no requirements for Health Physics Division involvement.
- Radioactive material is routinely moved between bunkers at the Manzano Area without coverage by health physics staff.
- Facility managers, safety coordinators, and "trained" radiation workers were observed to wear their dosimeters improperly and many persons contacted, including facility managers, supervisors of radiation workers, and workers who operate neutron generating equipment, were unaware of the SNL, Albuquerque, requirement to wear their dosimeter on clothing rather than on a chain around the neck.
- There is no consistent policy or color code for anticontamination clothing. Red, yellow, and white clothing are used for contamination control as well as for other purposes.
- Contrary to SNL, Albuquerque, policy, personnel outside of the health physics organization often interpret health physics requirements regarding posting, survey requirements, procedures, etc.
- Some routine radiation and contamination surveys are not performed at the SNL, Albuquerque, designated frequencies.
- A dose rate monitoring procedure for Technical Area V that was prepared in 1988 has not been implemented.
- Numerous users of radioactive materials and radiation generating devices indicated that they had requested health physics studies, guidance, or surveys within the past few months, but had not yet received assistance.
- These deficiencies were partially identified in the AL Appraisal of December 1990.
- This Concern was partially addressed in the PTTSA.

CONCERN:
(RP.1-3)
(H2/C2)

Radiation protection activities at Sandia National Laboratories, Albuquerque, are being performed without definitive written guidance or rigorous professional oversight, resulting in inconsistency and noncompliance with Department of Energy requirements.

FINDINGS:

- The PTTSA identified 12 findings in radiation protection that are known to be out of compliance with DOE Orders or

mandatory standards as well as 21 other deficiencies. This report documents additional instances of noncompliance.

- DOE/EH-0073, "Technical Safety Appraisal of the Sandia Reactors, ACRR, SPR III," (5/89), identified the following noncompliance with DOE Orders and mandatory standards that still persist on the SNL, Albuquerque, site: the absence of independent audits and inspections of the radiation protection program, the absence of internal audits in radiation protection, and the absence of a documented air monitoring program. Each of these concerns appears again in this report.
- There has been no formal evaluation of the acceptability of continued operation of the site, or of any facility on site, in noncompliance with DOE Orders and mandatory standards.
- This Concern was not addressed in the PT TSA.

CONCERN:
(RP.1-4)
(H2/C2)

Continued operation in noncompliance with Department of Energy radiation protection Orders, and mandatory standards has not been systematically evaluated.

RP.2 AUDITS AND INVESTIGATIONS

PERFORMANCE OBJECTIVE: The internal audit program for both routine operations and unusual radiological occurrences should provide adequate performance assessments.

- FINDINGS:**
- Internal audits of the SNL, Albuquerque, Radiation Protection Program have not been performed.
 - The absence of internal audits of radiation protection was identified in the DOE/EH-0073, "Technical Safety Appraisal of the Sandia Reactors, ACRR, and SPR III," May 1989.
 - This Concern was addressed in the PT TSA.

CONCERN: Internal audits of the Radiation Protection Program are not being
(RP.2-3) conducted, as required by DOE 5480.11 and DOE 5482.1B.
(H2/C1)

- FINDINGS:**
- A system of documenting minor radiation incidents, the Health Physics Anomaly Reporting (HPAR) System, has been established in Technical Area V. Minor incidents have been documented. In most cases, followup and corrective actions were appropriate. Documentation of the corrective action was less than adequate in some cases. Minor incidents involving contamination of skin or personnel clothing are not always entered into the employee's personal exposure file. The HPAR System has not yet been applied to other areas.
 - The current HPAR form has no provisions for a response from other organizations who have a role in the incident. Corrective actions are not formally tracked. Some of the health physics personnel contacted during the appraisal indicated they were aware of these deficiencies and intend to correct them. Other health physics staff (outside of Technical Area V) were not familiar with the system.
 - This Concern was partially addressed in the PT TSA.

CONCERN: The system for documentation and followup of incidents of
(RP.2-4) potential radiological significance is incomplete and does not
(H2/C2) apply sitewide.

RP.3

RADIOLOGICAL PROTECTION PROCEDURES AND POSTING

PERFORMANCE OBJECTIVE: Radiation protection procedures for the control and use of radioactive materials and radiation generating devices should provide for safe operations and for clearly identified areas of potential consequences.

- FINDINGS:**
- Although there is a system of Safe Operating Procedures in place and formally extended for use until new approved Standard Operating Procedures are in place, only one employee referred to Safe Operating Procedures when asked for an "SOP" for the work in their facility.
 - Some of the new Standard Operating Procedures are fully approved, but many more were either not approved or approved only by the line organization. Numerous users were using Standard Operating Procedures that indicated the need for sign-off by the health physics organization but were not signed.
 - One of the new Standard Operating Procedures for operation of an x-ray diffraction unit included detailed procedures for routine operation with the interlocks in place, but provided for a class of users that were permitted to bypass the interlocks. No controls were established for the conditions under which this was permitted. This Standard Operating Procedure was approved by the line organization and had been reviewed by the Health Physics Division. Health Physics had asked for minor revisions, but their comments did not address the fact that no control measures were specified for the people who were permitted to operate the machine with the interlocks defeated. One of the people allowed to bypass interlocks stated that he routinely did this and, in fact, used some controls. These included room entry control, keeping the power low, and using a radiation detection instrument. He was not issued extremity dosimetry.
 - SP 471473, "Activity Specific ES&H Standard Operating Procedure for X-ray Generating Devices (Ionizing Radiation) In the Materials and Process Sciences Directorate (1800)," dated April 1991, was approved and serves as the prototype procedure for x-ray machine operations. It requires that, prior to nonroutine operations such as instrument alignment where exposure to the primary beam is possible, the SNL, Albuquerque, Health Physics Division shall be notified either verbally or in writing. It also provides other controls for operation with interlocks bypassed. It requires the generation of a specific operating procedure for each device or group of devices at a single location. The specific procedures do not require approval by the Health Physics Division. The specific procedure for the devices in Bldg. 805, room 314, reference the generic procedure and contain most of the same controls for bypassing the interlocks except for the requirement to notify the Health Physics Division. These procedures are inconsistent.

- A researcher with other x-ray diffraction units indicated that the existing Safe Operating Procedures required that Health Physics be present any time interlocks were bypassed. The researcher did not expect the new Standard Operating Procedure to retain this requirement.
- An SNL, Albuquerque, employee working in the Manzano Area storage facility had never seen an approved SOP for his work. The approved SOP was dated March 1, 1990.
- Both the supervisor of the Reallocation Yard and one of the employees surveying material there stated there was a procedure for material survey. In fact, the procedure had not even been drafted.
- In violation of the SOP Number HP 30004-9003, "Radiation Safety Procedures, SNM Storage Areas, Bldg. 819 and Manzano Class "A" Structures," March 1, 1991, packages of radioactive material had been moved from Bldg. 819 to Bldg. 957 without being monitored for external dose rates by Health Physics.
- Radioactive materials packages had been moved from one Manzano Area storage bunker to another without being monitored by the Health Physics staff, as required by the Standard Operating Procedure.
- This Concern was not addressed in the PTTSA.

CONCERN:
(RP.3-2)
(H2/C2)

The Sandia National Laboratories, Albuquerque, procedure system is ineffective in providing for radiation protection.

FINDINGS:

- SOPs and training requirement documents for pulse generators, accelerators, and x-ray generating devices provide only general requirements necessary for certification as an operator of the device rather than specifying the training needed.
- With the exception of the radiation worker training course, none of the training requirements for radiation generating machine operator certification require demonstration of proficiency by written examination.
- This Concern was not addressed in the PTTSA.

CONCERN:
(RP.3-3)
(H2/C1)

The certification process for operators of nonreactor radiation generating devices does not provide rigorous documentation of the requirements for certification, nor assurance that personnel have been trained, as required in DOE 5480.20, Attachment IV, Part 5.

FINDINGS:

- There are no controlled areas established in Technical Area V. (Technical Area V contains the reactors, hot cells and other radiation, high radiation and very high radiation areas.) Contaminated materials have been found (during the

followup to Occurrence Number SNL1-91-F6-005) outside of designated radiation areas in Technical Area V.

- In Technical Area III, there are unmarked contaminated areas (see Concern RP.10-3) as well as designated radiation areas.
- Many laboratories that use radioisotopes or contain radiation generating devices are labeled controlled areas, others are not. Still others may receive a temporary designation only while radiation generating devices are operated. One organization has established a practice of posting controlled area signs if the radiation generating device is in excess of 40 keV. This is contrary to the requirements of DOE 5480.11, Section 9k.
- This Concern was not addressed in the PTTSA.

CONCERN:
(RP.3-4)
(H2/C1)

Controlled areas are not posted consistently, as required by DOE 5480.11, Section 9k.

RP.4 EXTERNAL RADIATION EXPOSURE CONTROL PROGRAM

PERFORMANCE OBJECTIVE: External radiation exposure controls should minimize personnel radiation exposure.

- FINDINGS:**
- Formal criteria for dosimeter assignment was not documented in SAND88-1161, ES&H Manual, April 1988 (updated 1990). Also, dosimeter assignment does not correlate with radiation worker training.
 - While most hand contact work with radioactive material is performed using extremity dosimeters, some activities are conducted without appropriate dosimeters. Some personnel aligned x-ray generating machines without extremity dosimeters.
 - A new MN471001, ES&H Manual, February 28, 1991, and Radiation Protection Overview Program document will provide criteria for dosimeter assignment.
 - This Concern was addressed in the PTTSA.

CONCERN: Sandia National Laboratories, Albuquerque, has not established
(RP.4-1) formal criteria for assigning personnel dosimeters, as required
(H2/C1) by DOE 5480.11.

- FINDINGS:**
- Although the experiment review system provides some level of control of personnel exposure from reactor experiment activities, SNL, Albuquerque, does not have a radiation work permit system.
 - This Concern was addressed in the PTTSA.

CONCERN: A formal permit system for control of radiation work has not been
(RP.4-2) implemented by Sandia National Laboratories, Albuquerque.
(H2/C2)

RP.5 EXTERNAL RADIATION DOSIMETRY

PERFORMANCE OBJECTIVE: The routine and accident personnel radiation dosimetry programs should ensure that personnel radiation exposures are accurately determined and recorded.

- FINDINGS:**
- SNL, Albuquerque, dosimeter issue and exposure control program permits nonemployees to receive radiation exposure without knowing their exposure history.
 - This Concern was partially addressed in the PTTSA.

CONCERN:
(RP.5-2)
(H2/C1) The Sandia National Laboratories, Albuquerque, exposure control program does not ensure nonemployee radiation exposure is maintained below the regulatory limit, as required by DOE 5480.11.

- FINDINGS:**
- The Alnor self-reading dosimeters are used along with the primary thermoluminescent dosimeter for dose indications in Technical Area V and by the Radioactive and Mixed Waste Division. These are not in the calibration program.
 - Self-reading dosimeters used in other areas of SNL, Albuquerque, are not included in the calibration program.
 - This Concern was not addressed in the PTTSA.

CONCERN:
(RP.5-3)
(H2/C1) Self-reading radiation dosimeters used at Sandia National Laboratories, Albuquerque, are not included in the calibration program, as required by DOE 5480.11 and ANSI N13.5-1972.

RP.6 INTERNAL RADIATION EXPOSURE CONTROL PROGRAM

PERFORMANCE OBJECTIVE: Internal radiation exposure controls should minimize internal exposures.

FINDINGS: • The respiratory protection program does not comply with ANSI Z88.2.

CONCERN: See Concern IH.5-2.

FINDINGS: • Airborne radioactivity survey information is not provided for all locations for which air monitoring may be needed.

CONCERN: See Concerns RP.9-1 and IH.4-1.

RP.7 INTERNAL RADIATION DOSIMETRY

PERFORMANCE OBJECTIVE: The internal radiation dosimetry program should ensure that personnel radiation exposures are accurately determined and recorded.

- FINDINGS:**
- The FASTSCAN whole body counter has not yet arrived. If it is necessary to determine whether an intake of radioactive material has occurred, the employee would need to go to Los Alamos National Laboratory or wait for the mobile service to arrive.
 - A contractor has not been selected to analyze urine and/or feces samples.
 - The selection of individuals and the frequency for in vivo or in vitro analyses is not documented, as required by DOE 5480.11.
 - This Concern was addressed in the PTTSA.

CONCERN:
(RP.7-2)
(H3/C1)

The Internal Dosimetry Program is not yet fully implemented, as required by DOE 5480.11, Section 9m.

RP.8 FIXED AND PORTABLE INSTRUMENTATION

PERFORMANCE OBJECTIVE: Personnel dosimetry and radiological protection instrumentation used to obtain measurements of radioactivity should be calibrated, used, and maintained so that results are accurately determined.

- FINDINGS:**
- At Bldg. 6630, the radiation detection instrument had been sent in for calibration and no instrument was available for personnel to perform personal surveys after working with radioactive contaminated equipment.
 - Several x-ray facilities had no radiation detection instruments available during the appraisal because they had been removed for calibration.
 - This Concern was not addressed in the PT TSA.

CONCERN: Some radiation work is conducted without instruments while they
(RP.8-3) are removed for calibration.
(H2/C2)

- FINDINGS:**
- The Remote Area Monitors at numerous locations were noted to be showing radiation levels that were greater than those measured with other instrumentation. The staff stated that the meter indications were intentionally caused by an internal signal used to ensure instrument function.
 - This finding was reported in a June 1986 audit of the ACRR.
 - This Concern was not addressed in the PT TSA.

CONCERN: Remote Area Monitors indicate incorrect readings.
(RP.8-4)
(H2/C2)

RP.9**AIR MONITORING**

PERFORMANCE OBJECTIVE: Air monitoring systems through selection, location, calibration, and maintenance should ensure reliable estimates of air activity for radiological control purposes.

- FINDINGS:**
- Bldg. 9939 C is posted as a respirator area and personnel working in the facility wear respiratory protective devices. However, air sampling is not conducted at the facility to determine air concentrations and the level of respiratory protection required.
 - Bldg. 819 was used for the storage of radioactive material including SNM. (Some of this material did not have evidence of monitoring prior to placement.) No air sampling or monitoring had been performed to determine the concentrations of airborne activity in the facility.
 - Entry and work in the SNL, Albuquerque, assigned portions of the Manzano Area radioactive material storage areas is routinely performed with no air sampling or monitoring prior to entry. No study had been conducted to assure that air sampling/monitoring is unnecessary.
 - There was no formally documented air monitoring program in place at SNL, Albuquerque.
 - This Concern was addressed in the PTTSÄ.

CONCERN:
(RP.9-1)
(H2/C1)

Personnel are permitted to enter and work in areas with a potential for airborne radioactive contaminants that have not been monitored, as required by DOE 5480.11.

RP.10**RADIATION MONITORING/CONTAMINATION CONTROL**

PERFORMANCE OBJECTIVE: The radiation monitoring and contamination control program should ensure worker protection from radiation exposures.

FINDINGS:

- As a result of past operations, contaminated or activated material is occasionally found outside of designated radiation areas and radioactive materials areas. (A careful survey of a laboratory in Technical Area V revealed several such items.) Although such areas are scheduled to be designated and marked as controlled areas, this has not been done in all cases.
- When an SNL, Albuquerque, employee wishes to dispose of excess property, the employee fills out a form to have it picked up by the Reallocation Division. A survey by personnel from the Health Physics Division is made only if requested by the employee disposing of the property.
- Before excess property is picked up by the Reallocation Division, it is inspected for potential toxic or hazardous materials and given a cursory survey with a Geiger-Muller type instrument by a contract technician assigned to the Reallocation Division. Although one technician and the supervisor of the Reallocation Yard stated that there was a procedure for such surveys, later investigation indicated that it did not exist.
- An interview with one of the technicians who performs these surveys indicated that the technician had received training from an individual within the Radioactive and Mixed Waste Division, and believed the instructions had been to operate the instrument on the least sensitive scale (100X rather than 1X). Material is usually surveyed on pallets without additional handling so that not all surfaces are covered. Surveys for removable contamination are not made.
- Once the material is received at the Reallocation Yard, it is again surveyed in the same manner. In fact, the practice seemed to be to resurvey it in this manner each time it was moved, including prior to delivery to another agency or auctioneer. None of the surveys performed by the Reallocation Division are documented, as required by DOE 5400.5.
- A recent Unusual Occurrence Report documented the fact that five items were found in the Reallocation Yard with detectible radiation levels. Levels on three items exceeded those specified in DOE 5480.11 and DOE 5400.5. (A cursory survey by the S&H Subteam revealed no such items.)
- A draft memorandum, "Guidance on the Definition and Interpretation of What is Radioactive Waste," March 30, 1991, has been prepared by the Radioactive and Mixed Waste Division to assist plant personnel in determining appropriate

disposition of excess material. The memorandum has not yet been distributed.

- A May 1990 letter from N. R. Ortiz to A. R. Chernoff of AL outlined the status of compliance with DOE 5400.5 and identifies this concern. It indicates that, "If adequate funding is made available, SNL, Albuquerque, should be able to fully implement the requirements of this Chapter within one year."
- This Concern was addressed in the PTTSA.

CONCERN:
(RP.10-2)
(H2/C1)
CAT. II

Sandia National Laboratories, Albuquerque, has no effective radiation survey program to ensure that material released to the public meets the criteria established in DOE 5400.5.

FINDINGS:

- There are at least three outdoor locations where tests have involved firing projectiles containing depleted uranium at stationary targets. In these locations, the largest pieces thought to contain depleted uranium have been removed but small pieces and measurable contamination remain. The locations are neither marked to indicate the hazard nor are personnel and vehicle traffic controlled. Surveys for possible contamination are not required or performed when leaving these areas.
- This Concern was addressed in the PTTSA.

CONCERN:
(RP.10-3)
(H2/C1)
CAT. II

Personnel may be exposed to radioactive contamination in excess of Department of Energy limits and may transfer that contamination to other areas because some contaminated areas are not marked, nor are proper egress surveys performed, as required by DOE 5480.11.

FINDINGS:

- In the PBFA II facility, a temporary confinement system and a vacuum cleaner both use HEPA filters on the effluent. However, the HEPA filter installations had not been dioctyl phthalate (DOP) tested, as required by DOE Orders and ANSI/UL 586.
- HEPA filters used to clean the effluent from a uranium vaporization experiment in Bldg. 865 had not been DOP tested.
- This Concern was not addressed in the PTTSA.

CONCERN: Not all high-efficiency particulate air filters used for cleaning
(RP.10-4) of gaseous effluent have been performance tested, as required by
(H2/C1) DOE 6430.1A, ANSI/UL 586, and ASME N 510-1989. (See Concern
AX.5-1.)

FINDINGS:

- A glovebox used to grind activated material in the PBFA II facility had gloves with numerous tape patches. In most facilities, such gloves would have been replaced.
- This Concern was not addressed in the PTTSA.

CONCERN: Glovebox gloves are frequently patched rather than replaced as
(RP.10-5) industry practice dictates.
(H2/C2)

PERFORMANCE OBJECTIVE: A formally structured, auditable program should be in place with established milestones to ensure that exposures are maintained as low as reasonably achievable (ALARA).

FINDINGS:

- Room 212a in Technical Area V is referred to as the cutting closet. It was lined with plastic and used to cut experimental samples with a diamond saw. It was contaminated up to a few hundred counts per minute alpha and several thousand counts per minute beta shortly before it was removed from service in the summer of 1988. Since that time, no entries or surveys have been made, and no plans are in place to decontaminate it (although the facility manager indicated that he intends to clean it up as soon as possible).
- The Sandia Engineering Reactor was defueled and filled with dirt or gravel in the mid-sixties. There have been conflicting reports about the level of interest in decommissioning it, and there are no firm plans at present.
- A basement laboratory in Bldg. 805 contains various radioactive chemicals and may not be entered without shoe covers. Contamination levels make it unusable for current research; however, there is no plan in place to clean it.
- A basement room in Bldg. 869 (room B10) is designated as the "toxic machine shop" because it was used to machine uranium and beryllium. It has not operated for approximately 2 years. Entry is restricted, and there is no plan in place to decontaminate it.
- Bldg. 9939E is designated as a respiratory protection required area since it was used to saw uranium oxide billets. It has not been used since 1989, and is considered unusable in the future.
- Three laboratories in Bldg. 891 no longer use tritium. They are still considered controlled areas because of contaminated equipment.
- In Bldgs. 809 and 835, there are cabinets full of weapons parts, such as depleted uranium parts and tritium-containing neutron generators, some of which appear to be unnecessary.
- In each case above, the contaminated facilities and radioactive materials are assigned to different owners. Cleanup activities are hampered by waste disposal limitations.
- This Concern was not addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, has not addressed the
(RP.11-1) problem of the accumulation of unneeded contaminated facilities
(H2/C2) and radioactive materials, nor have plans been developed to
reduce them as the as-low-as-reasonably-achievable (ALARA)
philosophy indicates.

FINDINGS: • This Concern was not addressed in the AL Self-Assessment.

CONCERN: The Albuquerque Operations Office has not addressed the problem
(RP.11-2) of the accumulation of unneeded contaminated facilities and
(H2/C2) radioactive materials, nor have plans been developed to reduce
them as the as-low-as-reasonably-achievable (ALARA) philosophy
indicates.

FINDINGS: • Only the Technical Area V reactors have formal ALARA goals
and these deal only with the whole-body dose of personnel
assigned to the reactor division. Experimenters who use the
reactors may receive more than 1 rem per year, but are not
covered by a formal ALARA program. (The ALARA goals for each
of the two reactor groups covered was not more than 5 person-
rem whole body exposure. These groups accounted for less
than 30 percent of the laboratories 33 person-rem.)

• No ALARA goals have been established to reduce the number of
radiation sources or the areas that are contaminated.

• SAND 88-1161, the current ES&H Manual, does not have a
definitive ALARA program. MN 471001, the new ES&H Manual,
which is not fully implemented, establishes the philosophy of
ALARA both in the general ES&H program and in the Radiation
Protection section. PG 470044, "Sandia National
Laboratories: Radiation Protection Overview Program,"
contains requirements for a comprehensive ALARA Program.

• This Concern was addressed in the PTTSA.

CONCERN: The Sandia National Laboratories, Albuquerque, As Low As
(RP.11-3) Reasonably Achievable Program (ALARA) for radiation protection
(H2/C1) does not fully meet the requirements of DOE 5480.11 and other
Department of Energy guidance.

RP.12**RECORDS**

PERFORMANCE OBJECTIVE: Records related to occupational radiation exposure should be maintained in a manner that permits easy retrievability, allows trend analysis, and aids in the protection of an individual and control of radiation exposure.

- FINDINGS:**
- Although not all personnel dose information has been placed in the Health Hazard Files, dosimeter results, bioassay results, whole body counting results, offsite dose data, and preemployment history data are available.
 - Unusual occurrence and accident investigation data were available. However, Health Physics Anomaly Reporting System incidents, such as personal skin and clothing contamination events, were not included in the files unless they resulted in an Unusual Occurrence Report or higher level investigation.
 - These deficiencies were partially identified in the AL Health Protection Division appraisal of September 1, 1986.
 - This Concern was addressed in the PTTSA.

CONCERN:
(RP.12-1)
(H3/C1)

Personnel exposure files do not contain all the radiological information related to personal exposures and radiological working conditions, as required by DOE 5480.11.

- FINDINGS:**
- A report of the activity detected in each individual from whole body counting, along with information on the measurement sensitivity, is provided by the contractor. Since only one copy was available, it was not clear if all appropriate divisions had seen the report.
 - Urinalyses, primarily for tritium, were performed by the Industrial Hygiene Division. For 1990, the results were handwritten on a single piece of paper with data for each individual on a line making it difficult to incorporate into individual exposure files. No information on the analytical instrumentation was included or referenced.
 - For 1989, individual cards were prepared for each employee in the internal dosimetry program but no dose calculation method was given.
 - This Concern was addressed in the PTTSA.

CONCERN:
(RP.12-2)
(H3/C1)

The Sandia National Laboratories, Albuquerque, internal dosimetry records are not generated and maintained, as required by ANSI N13.6 and DOE 5480.11.

4.5.15 Worker Safety and Health Compliance

4.5.15.1 Overview

A comprehensive safety and health compliance OSHA-type appraisal covering general industry and construction standards was conducted at SNL, Albuquerque, to determine compliance with existing OSHA regulations as adopted by DOE. Noncompliances and hazards were documented and discussed with management at the end of each day. Repeated noncompliances of the same standard in a department were only noted once on the inspection report form. (See Appendix F.) All performance objectives for the Worker Safety and Health (OSHA) Compliance technical area were evaluated.

Thirty-one buildings and all major construction sites were inspected for compliance with OSHA regulations. Evaluation criteria were based, in part, on OSHA general industry and construction standards, 29 CFR 1910 and 29 CFR 1926, respectively.

The inspection covered major laboratories, process, service, and maintenance buildings. The appraisal focused primarily on areas selected according to where the majority of the employees worked, where hazardous materials were present, the type of activity, the size of the activity, and the size of the building. Facilities satisfying these criteria are the maintenance shops, hazardous materials storage areas, materials storage areas, hazardous waste disposal and decontamination areas, laboratories, and process buildings. These buildings encompass a majority of the hazardous workplaces. A less comprehensive sample of office buildings and other low-hazard areas was also inspected.

A total of 433 noncompliance issues were identified. Of these, 417 were considered serious (96%) and 16 were classified as other than serious (4%). The high percentage of serious noncompliance issues may be misleading because the appraisal team expended most of its effort in identifying this type of issue. Furthermore, de minimis issues noted during appraisal are not included in the inspection forms. Table WS-1 provides a summary of the buildings that were inspected, the number of noncompliance issues noted and the OSHA noncompliance classification of each. Appendix F is a tabulation, by building, of all noncompliances of OSHA standards and the classification of each.

The team noted that the individual deficiencies and noncompliances noted in the inspection reports (Appendix F) were being corrected almost as soon as they were identified. This is commendable; however, a long-term solution involves evaluation of the root causes for the noncompliances.

Collectively, the findings indicate serious deficiencies in the following areas:

- In the Bldg. 840 Machine Shop, the 72-inch HYPRO Vertical Turning Lathe was observed in operation without proper guarding of the rotating chuck and ingoing nip points created by the guard, thus exposing an employee to serious injury by the rotating chuck. This condition resulted in a Category I concern.

- Noncompliance with machine guarding requirements was noted in numerous locations, resulting in serious hazards to the employees. For example, lack of chuck guarding for lathes and milling machines in Bldgs. 840, 841, and 892; improper guarding of belt sanders, band saws, and drill presses in Bldgs. 6630 and 6750; and failure to provide anti-restart devices for industrial equipment in Bldgs. 6750, 6630, and 841. The magnitude of machine guarding deficiencies resulted in a Category II concern.
- A 40-ton hydraulic construction crane, used to set utility poles at the Technical Area II running track, was noted to have serious equipment deficiencies. In addition, construction crane operator training deficiencies were discovered. Numerous other deficiencies related to the overall crane and rigging program at SNL, Albuquerque, existed with regard to training of operators, inspection of equipment, utilization of defective cranes, and modification of crane superstructures. Because of the high number of deficiencies, and the serious ramifications associated with crane or rigging failure, three Category II concerns were expressed with respect to the crane and rigging program.
- A representative sampling of inspected worksites revealed numerous serious electrical hazards. For example, in Technical Area III, at the auto service area, a 220-volt electrical service cabinet, which was located in a wet and damp location, was not weatherproof. The panel board had been modified and was not dead front in design, exposing employees to energized wiring. A control cabinet in Bldg. 858 in the Acid Waste Neutralization Area was observed to contain exposed 480-volt contacts. The cabinet was not used as a single purpose 480-volt electrical installation. Two breaker slot covers in the lighting panel in Bldg. 892, Model Analysis Laboratory, were not in place exposing employees to electrically energized parts. Other hazards included improper use of flexible cords, improper labeling of electrical panels, and ungrounded electrical equipment. These unsafe electrical system conditions have resulted in a Category II concern.
- Implementation of the Hazard Communication Program is deficient. The development and implementation of a Chemical Hygiene Plan has not been accomplished.
- Workplace monitoring for selected chemical and physical hazards by industrial hygiene has not been evaluated in many cases.
- More than 50 percent of all the construction subcontractor's fleet vehicles were noted with some type of safety problem.

Industrial Hygiene

It was not necessary to conduct air sampling during this appraisal because no employees were observed to be involved in jobs which were subjected to excessive levels of airborne contamination. During this appraisal, no asbestos removal or cleanup was observed to afford confirmation of program adequacy or evaluation of performance in these areas.

At the request of this appraisal team, Industrial Hygiene Department personnel collected wipe samples from the tops of work benches to determine if lead contamination was present. These samples were analyzed, and confirmed that the surfaces were contaminated with inorganic lead.

The noncompliance with OSHA regulations and standards reflect, in part, the lack of a proactive compliance-oriented industrial hygiene program.

Industrial Safety

The SNL, Albuquerque, Industrial Safety Program has not implemented a procedure for industrial site overview by safety staff. The 20-person staff indicate that the majority of time is spent with research review prior to experiment startup, and very little time is spent with overview of field operations. The field management has not been sufficiently trained on hazard recognition, as confirmed by field interview and observation.

The Construction Safety Program is coordinated by an SNL, Albuquerque, Manager with a staff of 23 inspectors who perform both safety and health compliance oversight, as well as contractor acceptance. Fifteen of these inspectors are contracted from a consulting engineers office. Although the staff is highly dedicated, it became obvious by interview and observation that they needed additional training in hazard recognition and safety enforcement.

**TABLE WS-1
BUILDINGS INSPECTED AND
NONCOMPLIANCE INFORMATION**

Location	Number of Noncompliances	
	Serious	Other-Than-Serious
Technical Area I		
General to Area	37	--
Building 605	5	--
Building 800	3	--
Building 808	7	2
Building 809	3	1
Building 840	35	--
Building 841	61	--
Building 858	74	6
Building 860	19	3
Building 861	5	--
Building 863	5	--
Building 864	14	--
Building 866	9	--
Building 867	1	--
Building 875	5	--
Building 876	1	--
Building 887	3	--
Building 892	4	--
Building 893	11	1
Building 894	3	1
Technical Area II		
General to Area	3	--
Building 966	2	0
Technical Area III		
General to Area	2	1
Building 6501	1	--
Building 6520	2	--
Building 6587	11	--
Building 6588	5	--
Building 6591	11	--
Building 6596	4	--
Building 6630	19	--
Building 6750	7	--
Technical Area IV		
General to Area	15	--

**WS-1
BUILDINGS INSPECTED AND
NONCOMPLIANCE INFORMATION
(Continued)**

Location	Number of Noncompliances	
	Serious	Other-Than-Serious
Employee Services Area	6	--
Central Training Academy	10	--
Construction Sites		
Building 4582	2	--
General Site	8	--
Building 9960	2	--
Building 9980	1	--
Manzano	1	1
TOTAL	417	16
Percent	96	4
Total Noncompliances	433	

4.5.15.2 Findings and Concerns

WS.3 COMPLIANCE WITH OCCUPATIONAL HEALTH STANDARDS FOR GENERAL INDUSTRY

PERFORMANCE OBJECTIVE: Site/facility should comply with DOE-prescribed standards for the evaluation and control of occupational health hazards.

NOTE: Noncompliance with this performance objective is documented utilizing the OSHA Form 1B format and compiled in Appendix F to the Tiger Team Assessment Report.

- FINDINGS:**
- There is no written Hazard Communication Program specific for each worksite at SNL, Albuquerque.
 - SNL, Albuquerque, written generic Hazard Communication Program does not address methods to provide other onsite employer(s) copies or information regarding material safety data sheets (MSDS) for each hazardous chemical the other employer(s)' employees may be exposed to while working.
 - Labeling of hazardous chemicals used at SNL, Albuquerque, was deficient. For example, a labeled container of tantalum powder in Bldg 858, Metals Bay, did not have appropriate hazard warnings. There was no MSDS for the tantalum powder. In addition, Dewar vessels for liquid nitrogen were not labeled.
 - Training of subcontractor employees was nonexistent as it related to the SNL, Albuquerque, Hazard Communication Program.
 - Subcontractors were noted using materials which were not properly labeled. For example, containers of welding rods used in Yard 1 at Bldg. 966 did not have appropriate hazard warnings on the labels.
 - Training of SNL, Albuquerque, employees in the area of hazard communication was deficient regarding the details of written programs, physical and health hazards, methods and observations that may be used to detect the presence or release of hazardous chemicals, and measures employees can take to protect themselves. For example, employees working in the Foundry located in Bldg. 841, who are potentially exposed to carbon monoxide gas during the melting and pouring of metals, were not trained regarding the hazards related to carbon monoxide exposure.
 - A Chemical Hygiene Plan has not been developed or implemented within laboratories at the SNL, Albuquerque, site.
 - Employees working in Bldg. 841 use PEP Set 53-959, which contains 30-60 percent phenol-formaldehyde, had not been monitored to determine their personal exposure to airborne levels of formaldehyde.

- Chemically incompatible materials were improperly stored. For example, in Bldg. 858 in the SOI Bay, acetic acid was stored in close proximity with nitric acid, hydrofluoric acid, and sulfuric acid.
- This Concern was not addressed in the PTTSA.

CONCERN: See Concern IH.6-2.

- FINDINGS:**
- Employee exposure to chemical hazards has not been fully evaluated. For example, chemicals such as formaldehyde and inorganic lead, which require mandatory workplace monitoring of employee exposure, have not been addressed. Employees working in Bldg. 841 who use PEP Set 53-959, which contains 30-60 percent phenol-formaldehyde, had not been monitored to determine their personal exposure to airborne levels of formaldehyde. Employees working in the Machine Shop of Bldg. 6591, who use machine metal alloys containing lead, have not been monitored to determine their personal exposure to airborne levels of inorganic lead.
 - Employee exposure to metal alloys containing chromium and nickel have not been fully evaluated. For example, the Plasma Arc Cutting Operator located in Bldg. 6630 has not been evaluated for exposure to metal fumes.
 - At the direction of S&H Subteam members, wipe samples were collected at the CTA to determine the presence of inorganic lead contamination. Cleaning tables for pistols and rifles were contaminated with lead.
 - Employee exposure to physical hazards such as noise has not been fully evaluated. For example, comprehensive noise surveys of Bldg. 841, Foundry area, and Bldg. 6630, Plasma Arc Cutting Operation, have not been conducted to ascertain the need for a hearing conservation program.
 - SNL, Albuquerque, did not identify the need for mandatory noise monitoring.
 - See Concerns IH.4-1, IH.5-1, and MS.1-1.
 - This Concern was partially addressed in the PTTSA as it related to mandatory monitoring for lead and formaldehyde exposure.

CONCERN: Sandia National Laboratories, Albuquerque, is not in compliance (WS.3-1) with the monitoring requirements of 29 CFR 1910.95, Occupational (H1/C1) Noise Exposure; 29 CFR 1910.1025, Lead; and 29 CFR 1910.1048, Formaldehyde.

- FINDINGS:**
- Single-use 3M 8710 respirators were made available for employee use, for example, in Bldgs. 841 and 6630.

- References to single-use respirators, used in Bldg. 841, the Wood Model and Pattern Shop, were not included in SNL, Albuquerque, Respiratory Protection Program with regard to written standard operating procedures, training in their use and limitations, and surveillance of the work area conditions and degree of employee exposure.
- An air line respirator protection system located in the basement of Bldg. 858 is supplied breathing air through a line which serves a dual function as a backup nitrogen gas line to other operations. The breathing air line was not designated for breathing air only.

CONCERN: See Concern IH.5-2.

- FINDINGS:**
- Several confined spaces were not identified by SNL, Albuquerque. For example, a 20-foot-deep pit on the west side of the main entrance to Bldg. 840, and steam pits numbered 111 and 112 outside of Bldg. 858.
 - The confined space beneath the melt furnaces in the Foundry area of Bldg. 841 was not monitored for toxic gases such as carbon monoxide.
 - SNL, Albuquerque, confined space entry procedures allow employees to enter areas if oxygen testing indicates levels of at least 19.5 percent oxygen present. The procedures have no provisions for ES&H professionals to evaluate the confined spaces if oxygen levels are between 19.5 and 21 percent.
 - SNL, Albuquerque, is not implementing the requirements of ANSI Z.117.1-1989.
 - Current SNL, Albuquerque, confined space entry procedures do not address the "zero energy state" concept or the use of energy isolating devices, such as a slip blind and a block or line valve.
 - This Concern was addressed with PTTSA.

CONCERN:
(WS.3-2)
(H1/C1)

Sandia National Laboratories, Albuquerque, does not have a comprehensive confined space entry program and is not in compliance with Section 5(a)(1), "General Duty Clause" of the Occupational Safety and Health Act of 1970.

WS.4 COMPLIANCE WITH OCCUPATIONAL SAFETY STANDARDS FOR GENERAL INDUSTRY

PERFORMANCE OBJECTIVE: Workplace should be free of uncontrolled physical hazards and be in compliance with DOE-prescribed occupational safety standards.

NOTE: Noncompliance with this performance objective is documented utilizing the OSHA Form 1B format. A compilation of these completed forms is included as Appendix F to the Tiger Team Assessment report.

- FINDINGS:**
- Employees were exposed to numerous tripping hazards throughout the facility. For example, in Bldg. 858, a ventilation duct hanger bolt extending through the expanded metal flooring of the second floor mezzanine. In the same area, overlapping pieces of metal flooring resulted in an uneven walking surface. In Bldg. 841, the Foundry area, metal grading around the Metal Melt Furnace was loose and caused a tripping hazard to exist.
 - There are no floor loading limit signs posted for the expanded metal flooring of the second floor mezzanine in Bldg. 858.
 - There is no toeboard on the 6-ton crane walkway in the Machine Shop in Bldg. 840.
 - Poor housekeeping practices were observed in the Compressor Room of Bldg. 866. The floor was littered with paper, cardboard, and empty pop cans.
 - Several emergency lighting systems were not maintained in proper working order.
 - Fire wall penetrations were not properly sealed.
 - Extensive use of portable metal ladders in fixed ladder applications was noted, both interior and exterior to Bldg. 840.
 - Crane access ladders were not designed or installed in accordance with OSHA requirements. The egress ladder to the 6-ton crane does not extend 36 inches above the crane walkway. In Bldg. 841, the north ladder has 5-3/4 inches clearance from the wall to the rung centerline. This is further reduced by piping passing between the ladder and the wall. In addition, there is no step-over provision from the ladder to the platform. The platform is behind the person attempting access. The south crane access ladder rung clearance from the wall is 6 inches.
 - Ladders for inside access to steam pits throughout the SNL, Albuquerque, site are not constructed according to OSHA requirements. There are no riser extensions, and the top step is not level with the platform.

- Standard guard rails and toeboards were not installed on the access platform for the Electron Beam Furnace located in Bldg. 6630.
- In Technical Area V, Bldg. 6591, the roof needed standard guard rails and toeboards around the perimeter.
- See Concerns OS.2-5, OP.5-1, MA.2-2, and FP.7-3.
- This Concern was addressed in the PT TSA.

CONCERN:
(WS.4-1)
(H1/C1)

Aisles, walkways, and ladders were not always maintained in a clean and orderly manner, free of tripping hazards and obstructions, or meeting design criterion specified in 29 CFR 1910, Subpart D, Walking-Working Surfaces.

FINDINGS:

- Egress from buildings is restricted in many locations. For example, metal storage cabinets are located in the hallways of Bldgs. 858, 893, and 894, which present obstructions to safe egress.
- The walkway to the equipment area on the second floor (north and adjacent to SC-1) was blocked by lumber, creating a tripping hazard.
- In Bldg. 858, a roof access discharges to the roof of the second floor. The only exit to the ground is down a ladder to the roof of the first floor and the only way off the first floor roof is a door locked from the inside.
- The exit door from room 1964 was not marked as an exit in Bldg. 858.
- See Concerns IH.5-3 and FP.2-1.
- This Concern was addressed in the PT TSA.

CONCERN:
(WS.4-2)
(H2/C1)

Not all exits were properly marked and adequately lighted, and not all means of egress are to the nearest continuous and unobstructed exit, in accordance with 29 CFR 1910, Subpart E, Means of Egress.

FINDINGS:

- Several compressed gas cylinders were noted with out-of-date hydrostatic tests. For example, in Bldgs. 809, 860, 864, and 893, compressed gas cylinders for oxygen and nitrogen had their last hydrostatic tests conducted in May 1980, September 1981, March 1983, September 1983, and December 1983.
- This Concern was partially addressed in the PT TSA.

CONCERN: Compressed gas cylinders are not being visually inspected and hydrostatically tested to determine if they are in a safe condition, as specified in 29 CFR 1910, Subpart H, Hazardous Materials, and as prescribed in 49 CFR Parts 171-179 and 14 CFR Part 103, or with Compressed Gas Association Pamphlets C-6-1968 and C-8-1962.
(WS.4-3)
(H2/C1)

FINDINGS:

- Emergency eyewash facilities were not fully operable or readily accessible. For example, in Bldg. 858 outside the north dock, an emergency eyewash station did not provide sufficient water delivery through the right spigot. In Bldg. 893, room 23, access to the emergency eyewash station was blocked by shelves and other portable equipment.
- Several locations which presented chemical splash hazards to the eyes were not provided with emergency eyewash facilities. Some of these areas are: Bldg. 893, rooms 97B, 102, 104, and 78A. In Bldg. 850, room 161, there was no eyewash facility for the solvent wash tank.
- SNL, Albuquerque, acknowledged in their Self-Assessment that they have deficiencies with their safety shower and eyewash program.
- See Concern FS.5-1.
- This Concern was addressed in the PTTSA.

CONCERN: Emergency eyewash facilities are not supplied or readily accessible in all areas where the eyes may be exposed to injurious, corrosive materials, as specified in 29 CFR 1910, Subpart K, Medical and First Aid.
(WS.4-4)
(H2/C1)

FINDINGS:

- Frequent and periodic inspection records for the bridge cranes in Bldgs. 970 and 840 are incomplete prior to January 1991.
- No monthly signed and dated inspection reports exist for running wire rope in service for the bridge cranes in Bldgs. 970, 840, 882, and 892.
- Numerous cranes are allowed to remain in service with documented noncompliance conditions. This was reflected in the annual safety inspection reports for Cranes #B888, B887, B872, 6354, B601, and B602.
- The supporting structure for the overhead crane in the Heat Treat Room of Bldg. 840 showed evidence of repair by cutting and welding. No records exist to show evidence that the repair was reviewed by a qualified engineer or the equipment manufacturer.
- The supporting structure for the overhead crane in the Bldg. 6587 Machine Shop was re-rated for 2 tons. A 6-ton hoist was

installed on this structure with no re-rating posted on the hoist.

- SNL, Albuquerque, employees assigned to conduct frequent inspection of cranes and hoists are not fully trained in crane hoist inspection techniques. For example, two employees interviewed did not know or understand the acceptance or rejection criteria for running wire rope on overhead cranes. In addition, an SNL letter dated April 15, 1991, made reference to a "two blocking" accident which occurred on an overhead crane in Bldg. 840 due to a failed limit switch. The proper inspection criteria requires operators to check limit switches for proper operation daily, and should remove the crane from service if the limit switch fails to function properly. The crane was not removed from service.
- On April 18, 1990, SNL, Albuquerque, personnel discovered cracks in the supporting structure on two 10-ton overhead cranes in the high bay of Bldg. 970. The documented engineering review of the supporting structure was not produced until September 19, 1990. During this 5-month time period, the two 10-ton overhead cranes continued to operate in Bldg. 970 with no restrictions or limitations.
- A top running bridge crane located in Bldg. 882, room 6, was modified by SNL, Albuquerque, to strengthen the supporting structure. There was no documentation in the crane's history file to show evidence that the modification was reviewed by a qualified engineer or that the manufacturer had been consulted. This crane was purchased from Industrial Electric in 1987 and was rated from the manufacturer as a 1-ton lifting device. In January 1991, Diversified Inspections again modified the supporting structure and re-rated the crane for 2-ton capacity. There was no documentation in the inspection records to show evidence that the modification was reviewed by a qualified engineer or that the crane manufacturer had been consulted. At the time of this review, the crane was tagged out-of-service for load test qualification only.
- See Concerns OS.2-2 and MA.6-2.
- This Concern was addressed in the PT TSA.

CONCERN:
(WS.4-5)
(H1/C1)
CAT. II

Sandia National Laboratories, Albuquerque, does not have an effective program for the inspection, testing, maintenance, repair, and operation of cranes and hoists to ensure compliance with 29 CFR 1910.179, Overhead and Gantry Cranes.

FINDINGS:

- In Bldg. 840 Machine Shop, the 72-inch HYPRO Vertical Turning Lathe was observed in operation without proper guarding of the rotating chuck and with ingoing nip points.

- The 72-inch turntable was operating at a maximum speed of 110 revolutions per minute. The height of the table is approximately 36 inches.
- Most of the chip guarding had been removed so the operator could reach the tool bit to manually apply lubricant while the machine was in operation.
- One portion of the chip guard was left in place. Its location was to the right of the employee. The turntable rotated counter clockwise toward the edge of the chip guard which was constructed of sheet metal. The edge of the guard presented a "knife-like" edge.
- For the employee to reach the point of operation (tool bit) to apply the lubricant, the employee had to lean over the rotating turntable. Because of the size of the table, the employee had to stretch and "stand on his toes" to reach the point of operation.
- The employee was wearing loose-fitting clothing.
- An employee from SNL, Albuquerque, informed the S&H Subteam members that the Lathe Operator was actually wearing a "paper" smock which could tear if caught.
- Had the employee lost his balance or had his shirt sleeve or other piece of clothing caught in the lathe chuck, he would have been pulled into the machine. Because of the rotation of the turntable and the proximity of the remaining sheet metal guard to the position of the employee, there is no question that he would have suffered an amputation of his arm(s), leg(s), or possible impalement upon the guard. Further, because of the chuck speed, the chuck could become a "grinder," resulting in dismemberment of the employee.
- This Concern was addressed in the PTTSA.

CONCERN:
(WS.4-6)
(H1/C1)
CAT. I

An operator was observed performing an activity on the improperly guarded HYPRO Vertical Turning Lathe, located in Bldg. 840, which put his life and safety in immediate peril. The machine guarding for the Vertical Turning Lathe did not meet the requirements of 29 CFR 1910.212(a)(1), Machine Guarding, and 29 CFR 1910.212(a)(2), General Requirements Machine Guards.

FINDINGS:

- SNL, Albuquerque, has designed, fabricated, purchased, and installed several machine guards. However, guarding on some drill presses, lathes, vertical mills, band saws, shafting, and other equipment were still deficient. Machine guarding problems were generic to the SNL, Albuquerque, facilities. The following are examples to support this finding:
 - Chuck guarding for lathes was found to be inadequate in Bldgs. 840 and 892.

- Chuck guarding for milling machines was inadequate in Bldgs. 840 and 841.
- Guarding of belt sanders, band saws and drill presses was inadequate in Bldgs. 840, 841, 6630, and 6750.
- Anti-restart devices, to preclude restart of machines in the event of a power failure, are not utilized in all cases. For example, the drill press in Bldg. 6750, Monarch Lathe in Bldg. 6630, and Delta Table Saw in Bldg. 841.
- Wood working machines in Bldgs. 866 and 841 were not equipped with approved guards. The radial arm saw in Bldg. 841, Wood Model and Pattern Shop, does not return the blade to the back of the table, its starting position, when released. There was no point-of-operation guarding for the shaper located in Bldg. 866.
- SNL, Albuquerque, has taken steps to upgrade the guarding on some of their fixed machinery by installing barrier-type guards. In some cases, this type of machine guarding should also incorporate the use of an interlock to prevent machine operation when the guard is removed or raised.
- See Concern OS.1-2.
- This Concern was addressed in the PTTSA.

CONCERN:
(WS.4-7)
(H1/C1)
CAT. II

Guarding was not universally available and in place for equipment in Sandia National Laboratories, Albuquerque, facilities, as required in 29 CFR 1910, Subpart O, for Machines and Tools with Moving and Rotating Parts.

FINDINGS:

- A large number of electrical hand tools were noted with damage to their power cords. For example, Bldg. 860, a 1/2-inch drill motor cord was damaged at the attachment plug. A damaged 1/4-inch drill motor cord, damaged at the attachment to the drill, had its insulation broken, exposing live wires. In Bldg. 6587, a damaged electric cord on a Thor grinder had been repaired with electrical tape.
- See Concern MA.2-2.
- This Concern was addressed in the PTTSA.

CONCERN:
(WS.4-8)
(H1/C1)

Hand and portable powered tools and equipment are not being maintained in a safe condition for use by employees, as specified in 29 CFR 1910, Subpart P, Hand and Portable Powered Tools and Other Hand-Held Equipment.

FINDINGS:

- SNL, Albuquerque, has several major compliance problems with

regard to proper electrical installation, identification, and use.

- In Technical Area III at the Auto Service Area, a 220-volt electrical service cabinet which was located in a wet and damp location was not weatherproofed. The panel board had been modified and was not dead front in design, exposing employees to energized wiring.
- A control cabinet in Bldg. 858 in the Acid Waste Neutralization Area was observed to contain exposed 480-volt contacts. The cabinet was not utilized as a single purpose 480-volt electrical installation. Computer manuals and hardware were stored in the control cabinet.
- Two breaker slot covers in the lighting panel in Bldg. 892, Modal Analysis Laboratory, were not in place, exposing employees to electrically energized parts.
- The following generic deficiencies were noted in a representative sampling of inspected buildings:
 - SNL, Albuquerque, has flexible cords permanently wired into electrical boxes.
 - Electrical panels were not properly labeled.
 - Equipment was not properly grounded.
 - Electrical boxes had knockouts missing.
 - Flexible electrical cords were run through walls and floors.
- See Concern MA.2-3.
- This Concern was addressed in the PT TSA.

CONCERN:
(WS.4-9)
(H1/C1)
CAT. II

Sandia National Laboratories, Albuquerque, does not comply with 29 CFR 1910, Subpart S, Electrical, and in many cases, electrical hazards presented significant danger to employees.

FINDINGS:

- SNL, Albuquerque, employees that perform diving operations at the Technical Area III Drop Test Site conduct wetsuit diving operations in cold weather and cold water conditions. The American Conference of Government Industrial Hygienists guidelines for exposure to cold stress are not consulted to establish a safe working time to ensure the threshold limit values for cold stress are not exceeded.
- SNL, Albuquerque, has established that a basic open water certification, is the minimum acceptable level of training to qualify as a dive team member. This is a basic scuba diver

certification, and the scope of this training does not address the elements of industrial diving operations. For example, diver rescue and recovery, the use of lift bags for recovery operations, and dive planning for decompression are not addressed in open water training and certification.

- This Concern was addressed in the PTTSA.

CONCERN:
(WS.4-10)
(H2/C1)

Sandia National Laboratories, Albuquerque, is conducting commercial diving operations that are not in compliance with 29 CFR 1910.410, Qualifications of Dive Team and 29 CFR 1910.421, Pre-Dive Procedure.

FINDINGS:

- Several carbon dioxide fire extinguishes were not hydrostatically tested within the test prescribed interval.
- Several fire extinguishes were not in their proper location.
- See Concerns FP.1-1 and FP.7-2.
- This Concern was addressed in the PTTSA.

CONCERN:
(WS.4-11)
(H2/C1)

Sandia National Laboratories, Albuquerque, is not in compliance with 29 CFR 1910, Subpart L, Fire Protection.

FINDINGS:

- Several employees who have received respirator use training and can be called upon to perform as members of the emergency response organization during a spill emergency, were not trained as a first responder, as required by 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response.
- This Concern was addressed in the PTTSA.

CONCERN:
(WS.4-12)
(H2/C1)

Sandia National Laboratories, Albuquerque, is not in compliance with 29 CFR 1910, Subpart H, Hazardous Materials.

WS.5 COMPLIANCE WITH OCCUPATIONAL SAFETY STANDARDS FOR CONSTRUCTION INDUSTRY

PERFORMANCE OBJECTIVE: Workplace should be free of uncontrolled physical hazards and be in compliance with DOE-prescribed occupational safety standards.

NOTE: Noncompliance with this performance objective is documented utilizing the OSHA Form 1B format. A compilation of these completed forms is included as Appendix F to the Tiger Team Assessment report.

- FINDINGS:**
- More than 50 percent of the construction subcontractor's fleet vehicles inspected had some type of safety problem. For example, Industrial Contractors had a Ford 600 flatbed truck with three bald tires. Trinity Electric had two service vans with bald tires and broken windshields. B&D Electric had a service truck with two bald tires. Several vehicles were missing mud flaps and had broken taillights, brakelights, and headlights.
 - Sam Con had a forklift with no capacity placard; the controls were not labeled regarding their functions. Industrial Contractors had a Toyota forklift with no seatbelt, and the controls were not labeled for their function.
 - Sam Con had a transport trailer with no fenders, and the supporting trailer bed had broken planking.
 - These Concerns were addressed in the PT TSA.

CONCERN:
(WS.5-1)
(H1/C1)
Construction contractors are operating motor vehicles and mechanized equipment at Sandia National Laboratories, Albuquerque, that are not in compliance with 29 CFR 1926, Subpart O, Motor Vehicles and Mechanized Equipment.

CONCERN:
(WS.5-2)
(H1/C1)
Sandia National Laboratories, Albuquerque, is not in compliance with 29 CFR 1926.21(b) in that personnel who are assigned oversight responsibilities for construction contracts are not adequately trained to identify safety violations on motor vehicles and mechanized equipment.

- FINDINGS:**
- A construction contractor, Western Diversified, was supplying a 40-ton hydraulic crane to an electrical contractor for the purpose of setting utility poles at the Technical Area II running track. The crane was not maintained in a safe operating condition. The becket (end connection) for the dead end of the main hoist line was improperly rigged with the wire rope run through the becket from the wrong direction. No wire rope clips were installed on the dead end connection for the main hoist line. The wire rope on the main hoist line was kinked in several places, and was not properly spooled on the main hoist drum. The outrigger locks were not set during a hoisting operation that required the use of the crane's outriggers.

- A construction crane operator responsible for conducting frequent inspections of cranes and hoists was not trained in basic crane inspection techniques. The operator failed to demonstrate competency in wire rope inspection, main hoist reeving, and end connection attachment requirements.
- This Concern was addressed in the PTSA.

CONCERN:
(WS.5-3)
(H1/C1)
CAT. II

Construction contractor personnel are conducting hoisting and rigging operations at Sandia National Laboratories, Albuquerque, that are not in compliance with 29 CFR 1926.251, Rigging Equipment for Material Handling, and 29 CFR 1926.550, Cranes and Derricks.

FINDINGS:

- A Clark Mobile Crane owned by Gardner, Zemke, and Eubank was not safe for hoisting operations. The load hook had been modified by the construction contractor. A U-bolt had been welded to the hook for unknown reasons. The crane boom showed evidence of welding; a re-bar was welded to the boom to function as a line guide. Two windows were broken in the crane cab. The doors were removed from the engine enclosure exposing fan blades and running belts.
- Industrial Contractors had a Pitman Hydraulic Crane mounted on an International truck that was not safe to operate. The wire rope was kinked and flattened in several places; there was evidence of severe corrosion, and the crane controls were not labeled for their function.
- Construction contractor personnel, located at the Coyote Canyon Cable Site, are trained on the job by SNL, Albuquerque, personnel to qualify as operators of hoisting equipment owned by SNL, Albuquerque. This on-the-job training is not documented, and there is no training outline to define the minimum requirements to qualify contractor personnel in the operation of SNL, Albuquerque, hoisting equipment.
- SNL, Albuquerque, has personnel assigned to conduct inspections of contractor-owned cranes and hoists that are not fully trained in basic crane inspection techniques. The 40-ton crane listed in the first finding was inspected by SNL, Albuquerque, personnel and was cleared for safe operation on April 16, 1991.
- Construction contractor personnel were conducting hoisting and rigging operations at Bldg. 966 construction site with synthetic web slings that were not in serviceable condition. The slings were cut and damaged in several places with the color strands broken.
- Construction contractor personnel do not perform daily inspection of slings and other below-the-hook lifting devices prior to placing the lifting hardware in service.

- This Concern was addressed in the PT TSA.

CONCERN:
(WS.5-4)
(H1/C1)
CAT. II

Sandia National Laboratories, Albuquerque, is not in compliance with 29 CFR 1926.21, Safety, Training, and Education in that personnel assigned to conduct oversight of hoisting and rigging equipment are not fully trained in crane inspection techniques.

FINDINGS:

- Scaffolding was observed without proper fall protection, arm bracing, footing, and planking, and was not erected in accordance with manufacturer's specifications, as required by 29 CFR 1926.451, Scaffolding.
- This Concern was addressed in the PT TSA.

CONCERN:
(WS.5-5)
(H1/C1)

Sandia National Laboratories, Albuquerque, does not fully comply with construction standards 29 CFR 1926, Subpart L, Ladders and Scaffolding.

4.5.16 Industrial Hygiene

4.5.16.1 Overview

In assessing the Industrial Hygiene Program at SNL, Albuquerque, six performance objectives were addressed. The findings and concerns generated in this report are based on interviews with industrial hygiene personnel, line management, medical staff, research and craft staff members; observation of an emergency drill; facility orientation tours; audits of records; and worksite visits.

This review was directed at the SNL, Albuquerque, site and personnel. Observations are made on the SNL Self-Assessment. No industrial hygiene issues were noted during the appraisal which would be classified as "Imminent Danger." There were, however, a number of industrial hygiene subprograms which were either substantially deficient, undocumented, or not implemented such as the Hearing Conservation Program, Ergonomics Program, or a monitoring schedule for facilities and processes. Monitoring of the workspace to determine levels of protection and the overall adequacy of controls has been accomplished in a reactive manner. During the appraisal it was believed that SNL, Albuquerque, was more reactive than proactive in identifying and evaluating the workplace and associated processes. This general absence of independent professional industrial hygiene participation and overview in operating the Laboratory was noted throughout the evaluation. This is judged to be not so much a situation of insufficient hygienists and technicians, but an underutilization of that talent pool. Respiratory protection was found to have an excellent foundation, but lacked essential oversight to provide uniform implementation and guidance of the program.

Outside of evaluating the six designated program objectives and the implementation of the objectives, additional observations were made concerning the industrial hygiene group. The first was how the Industrial Hygiene staff members were physically separated. For a 13-member staff, there were seven different facilities in which they had their offices. Ideally, both the Industrial Safety and Industrial Hygiene staff would occupy a single facility. This serves to combine resources of personnel and materials to where they are better used with less duplication of effort, but more so, this increases cross-skills training of professional and technical staff members. Another observation was what appeared to be few established long- or short-range measurable and agreed upon goals and milestones for the department or the staff.

The PTTSA is consistent with what was noted during the appraisal. Most programmatic deficiencies were identified, but individual industrial hygiene programs were only given a cursory review for compliance.

The impression of SNL, Albuquerque, facilities is one where both management and personnel are making a concerted effort to correct past practices and attitudes towards occupational health concerns. There remains, however, an extreme sense of ownership at each facility. This sense of ownership by facilities, and the lack of authority vested with Industrial Hygiene when it comes to evaluating recommendations and followup to workplace exposures, will not promote necessary change. Directives and SNL, Albuquerque, manuals mandate how Industrial Hygiene is to implement programs and gives them the responsibility to comply, but fails to give them the necessary authority.

Therefore, Industrial Hygiene services are only requested when the facility line management perceives a need. This arrangement is neither proactive nor will it lead to protection of the worker or compliance.

4.5.16.2 Findings and Concerns

IH.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Site and facility organization and administration should ensure effective implementation and control of the industrial hygiene program.

- FINDINGS:**
- By management directive, all facility line management was to have developed a Preliminary Hazards Assessment by December 31, 1990. This endeavor involved limited Industrial Hygiene input, as line management asked questions on how to fill out the form, not questions relative to industrial hygiene type issues.
 - SNL, Albuquerque, does not have a mechanism in place to ensure that line management is in compliance with written industrial hygiene sub-programs, such as line supervision's responsibility to:
 - Notify Industrial Hygiene of ergonomic concerns.
 - Notify Industrial Hygiene 2 weeks in advance of planned changes that might affect noise levels.
 - Notify Industrial Hygiene to conduct ventilation surveys when modifications occur which might upset an existing system.
 - This Concern was not addressed in the PT TSA.

CONCERN:
(IH.1-1)
(H3/C2)

Sandia National Laboratories, Albuquerque, has not implemented for its facilities an Industrial Hygiene Program with sufficient independent overview to ensure compliance with Industrial Hygiene Subprograms and DOE 5480.10, and DOE 5483.1A.

- FINDINGS:**
- Outside of specific program elements assigned to individual staff members, no written short- or long-term assigned goals are established for professional and technical staff members.
 - See Concerns OA.3-1 and OP.1-1.
 - This Concern was not addressed in the PT TSA.

CONCERN:
(IH.1-2)
(H2/C2)

Sandia National Laboratories, Albuquerque, industrial hygiene management and supervision does not provide measurable and agreed upon goals and milestones for its professional and technical staff members.

IH.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Procedures and documentation should provide appropriate direction, record generation, and support for the industrial hygiene program.

- FINDINGS:**
- MN471001, the new ES&H Manual, February 28, 1991, contains a short descriptive chapter on industrial hygiene for line management. The decision to initiate monitoring in the workplace is left to the discretion of individuals untrained in the recognition, evaluation, and control of health hazards.
 - Within 26 subprogram documents, the SNL, Albuquerque, Industrial Hygiene/Toxicology Program/Subprograms Manual establishes 90 different line supervisor responsibilities of which supervisors may not be aware. This is a limited publication available only to the Industrial Hygiene staff.
 - SNL, Albuquerque, did not conduct formal internal appraisals on the Industrial Hygiene Program to evaluate the management and effectiveness of the Industrial Hygiene Program.
 - See Concern MS.1-1.
 - This Concern was partially addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, procedures and documentation do not provide clear guidance to ensure that potential industrial hygiene hazards are recognized and corrected and that industrial hygiene requirements are uniformly implemented, as required by DOE 5480.10, and DOE 5483.1A.

(IH.2-1)
(H2/C1)

IH.3 MANAGEMENT OF HEALTH CONCERNS

PERFORMANCE OBJECTIVE: Chemical, biological, physical, and/or other environmental stresses arising in the workplace should be identified, evaluated, and controlled.

- FINDINGS:**
- There is no written program to document or implement a comprehensive chemical, physical, biological, or ergonomic evaluation of each SNL, Albuquerque, facility, process, or environment. SNL, Albuquerque, relied upon the Preliminary Hazard Assessment (PHA) of each facility to include industrial hygiene concerns. The PHA was drafted by line management, with little to no input from Industrial Hygiene.
 - Deficiencies noted and recommendations made by Industrial Hygiene based on monitoring and evaluations of the workplace are not tracked to completion. Once the evaluation is given to line management, Industrial Hygiene files the report, effectively closing it.
 - This Concern was not addressed in the PTTSA.

CONCERN:
(IH.3-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, does not have an effective program to identify existing and potential health concerns throughout their facilities, nor do they track deficiencies required in DOE 5480.10, DOE 5483.1A, and DOE 5481.1B.

IH.4 SURVEILLANCE OF HEALTH CONCERNS

PERFORMANCE OBJECTIVE: Appropriate surveillance of activities should be conducted to measure industrial hygiene performance and ensure the continued effectiveness of controls.

- FINDINGS:**
- SNL, Albuquerque, does not have a periodic review process to ensure line management is in compliance with written industrial hygiene subprograms.
 - There is no QA or self-audit of the Medical and Industrial Hygiene Department records to ensure those employee exposures which exceed a Permissible Exposures Limit have been evaluated as required by the SNL, Albuquerque, Industrial Hygiene/Toxicology Program/Subprograms Manual "Laboratory Standard Program Occupational Exposures to Hazardous Chemicals in Laboratories." (See Concerns MS.1-1 and FS.5-4.)
 - SNL, Albuquerque, does not have a proactive surveillance or monitoring schedule to ensure line management is in compliance with written industrial hygiene subprograms.
 - See Concern WS.3-1.
 - This Concern was partially addressed in the PT TSA.

CONCERN:
(IH.4-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, does not have a comprehensive monitoring and surveillance program of work activities and facilities to identify, control, document, and trend the work environment and quantitatively establish controls, as required by DOE 5480.10.

IH.5 COMPLIANCE WITH OCCUPATIONAL HEALTH STANDARDS

PERFORMANCE OBJECTIVE: Site/facility operations comply with DOE-prescribed standards for the evaluation and control of occupational health standards.

- FINDINGS:**
- SNL, Albuquerque, has not conducted a sitewide noise survey to identify equipment, vehicles, aircraft, facilities, and processes where noise levels exceed the action level, as required in 29 CFR 1910.95.
 - Personnel Protective Equipment (PPE) is provided for noise attenuation without training the user as to proper application and limitations.
 - PPE is provided for hearing protection without consideration of whether the attenuation factor is appropriate for the application.
 - Subcontractor personnel are not notified of high noise exposure areas.
 - See Concerns WS.3-1 and OS.5-1.
 - This Concern was partially addressed in the PTTSA.

CONCERN: Sandia National Laboratories, Albuquerque, has not implemented a hearing conservation program, as required by DOE 5480.10, and (IH.5-1) 29 CFR 1910.95. (H1/C1)

- FINDINGS:**
- Supervisors of respirator users are not checking their employees to ensure the correct respirators are used and worn properly.
 - Personnel monitoring is not performed routinely or periodically to provide information on concentrations to assist in recognition or evaluation of respiratory hazards and the proper selection of respiratory protection equipment, as required in ANSI Z88.2-1980.
 - The effectiveness of the Respiratory Protection Program had not been evaluated within the previous 12 months, as required by ANSI Z88.2-1980, Section 3.
 - The selection of respiratory protection was limited to equipment from a single manufacturer which does not allow the user to select a unit best suited for their needs, as required in ANSI Z88.2-1980.
 - The determination of Self-Contained Breathing Apparatus (SCBA) needs by line management, does not meet the intent of Section 7.7 of ANSI Z88.2-1980.
 - Breathing air compressors are not always located so to preclude entry of contaminated air into the system. This is applicable to maintenance or other activities around air

inlets. An example was the SCBA breathing air compressor that shared an area with compressed gas cylinders of argon and methane.

- A coupling in a breathing air manifold system introduced the potential of servicing air line respirators with nonrespirable gases. This is in conflict with ANSI Z88.2-1980 and 29 CFR 1910.134.
- This item was partially addressed in the PTTSA.

CONCERN:
(IH.5-2)
(H1/C1)

Sandia National Laboratories, Albuquerque, Respiratory Protection Program does not comply with ANSI Z88.2-1980, DOE 5480.10, and 29 CFR 1910.134.

FINDINGS:

- Two Class III and Class IV laser rooms had a solenoid operated door locking mechanism requiring two independent motions to open the door, restricting egress.
- See Concerns WS.4-2 and FP.2-1.
- This Concern was not addressed in the PTTSA.

CONCERN:
(IH.5-3)
(H2/C1)

NFPA 101, "Life Safety Code," means of egress requirements are not being met while isolating laser laboratories.

FINDINGS:

- The safety controls regarding alignment and use of unprotected Class III and Class IV research lasers is not consistent between laboratories.
- Some laser SOPs did not quantitatively define and document nominal hazard zones while others included relevant calculations.
- Alignment procedures were not defined for some laboratories. The use of low power alignment lasers on devices to limit transmitted power are frequently not specified.
- One user indicated that eye protection was not always worn during alignment as he was thoroughly familiar with the equipment.
- This Concern was not addressed in the PTTSA.

CONCERN:
(IH.5-4)
(H2/C2)

Sandia National Laboratories, Albuquerque, lasers are not consistently controlled according to ANSI Z136.1-1986, Section 4, for lasers without protective housings. (See Concern IH.1-1.)

FINDINGS:

- SNL, Albuquerque, activities involve both OSHA and American Conference of Governmental Industrial Hygienists carcinogens in both laboratory and nonlaboratory areas. Chemical carcinogens observed during the appraisal included inorganic arsenic, methylene chloride, carbon tetrachloride, formaldehyde, nickel, and chromium.

- During the appraisal, there were no controlled or designated areas observed for the purpose of carcinogen control, as required by DOE 5480.10 and 29 CFR 1910.1450.
- The Laboratory did not implement a Chemical Hygiene Plan by January 31, 1991, as required by 29 CFR 1910.1450, and had not implemented a plan at the time of the appraisal.
- SNL, Albuquerque, has not performed initial monitoring or otherwise documented a rationale for not including employees working with carcinogens, reproductive toxins, or other hazardous chemicals in a medical surveillance program, as required by 29 CFR 1910, Subpart Z.
- Proactive periodic workplace monitoring for personnel exposure to hazardous chemicals has not been implemented, as required by DOE 5480.10.
- See Concern WS.3-1.
- This Concern was addressed in the PTTSA.

**CONCERN:
(IH.5-5)
(H1/C1)**

Sandia National Laboratories, Albuquerque, is not in compliance with carcinogen control requirements for either laboratory or nonlaboratory areas, as required by DOE 5480.10. and those mandated by DOE 5480.4.

IH.6 PERSONNEL COMMUNICATION PROGRAM

PERFORMANCE OBJECTIVE: Site/facility personnel should be adequately informed of chemical and biological stresses that may be encountered in their work environment.

- FINDINGS:**
- Procedural reminders and hazard posting were generally noted at entrances to facilities. Deficiencies in posting were noted in those areas where the hazard was not recognized by line supervision. In one case, posting was noted that gave the employee an option to comply, not an instruction as to when to comply.
 - Lack of ES&H oversight applicability of posting was noted.
 - Carcinogen warnings were not posted, as required by 29 CFR 1910, Subpart Z.
 - Posting in some areas requiring use of Personnel Protective Equipment are ambiguous. For example, one area posting indicated that safety glasses should be worn "WHEN REQUIRED."
 - This Concern was not addressed in the PT TSA.

CONCERN: Posting of hazards was sometimes ambiguous and not in conformance with requirements of by DOE 5480.4.
(IH.6-1)
(H2/C1)

- FINDINGS:**
- Industrial Hygiene files reviewed indicated notification to employees of monitoring results; however, no SNL, Albuquerque, directive requires or standardizes this requirement for either Industrial Hygiene, Medical, or outside contractors performing work in SNL, Albuquerque, workspaces.
 - See Concern MS.1-1.
 - This Concern was not addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, Industrial Hygiene/Toxicology Programs/Subprograms such as PG470020, "Industrial Hygiene Recordkeeping Management," February 14, 1991, do not require employee notification of monitoring results exceeding Permissible Exposure Limits, as required in DOE 5480.10.
(IH.6-2)
(H3/C1)

- FINDINGS:**
- Containers of hazardous chemicals such as methylene chloride were observed in shop areas without any labeling other than the name of the solvent in the container.
 - Tanks and vats such as parts washers were observed without any labeling as to contents or relative hazards.
 - Air, gas, and water lines without labeling were observed.

- Large storage tanks of oil at the PBFA II facility had no labeling as to contents of hazard.
- "Designated" and "controlled" areas for control of OSHA and American Conference of Governmental Industrial Hygienists carcinogens had not been established.
- This Concern was partially addressed in the PT TSA.

CONCERN:
(IH.6-3)
(H2/C1)

The Sandia National Laboratory, Albuquerque, has not implemented the posting and labeling requirements of 29 CFR 1910.1200.

4.5.17 Occupational Safety

4.5.17.1 Overview

In performing the occupational safety portion of the appraisal, each of the five Occupational Safety performance objectives were addressed. Information used in developing this section of the report was obtained from walkthroughs of Laboratory facilities; ES&H program documentation; observation of activities; SNL, Albuquerque, records and files; employee interviews; interviews with professional staff; and interviews with members of management. Also considered were the findings and concerns developed by the S&H Subteam members evaluating Worker Safety and Health (OSHA) Compliance. Findings relative to the Laboratory's self-assessment process relate to the PT TSA.

Two key issues became evident during the course of the occupational safety appraisal. First, professional ES&H oversight exercised over Laboratory activities has been lacking. Second, until just prior to the appraisal, there has been little or no program documentation defining the scope and direction of safety and health programs at SNL, Albuquerque.

The Laboratory has not required their professional health and safety staff to exercise any oversight responsibility. Safety and industrial hygiene personnel are considered to be "consultants" and do not perform inspections or appraisals of the areas for which they are responsible. Professional health and safety personnel at SNL, Albuquerque, are frequently not familiar with all activities being performed by the divisions within their responsibility, and may not have ever been inside the associated facilities.

Implementation of health and safety requirements has, until recently, been up to individual researchers and supervisors, many of whom considered compliance to be optional. There was no followup or other form of internal assessment by professional health and safety personnel to determine or verify compliance.

Prior to the appraisal, health and safety program documentation was sparse. There were no program documents that established health and safety controls which were intended to be compliant with all requirements made mandatory by the DOE.

There was SAND88-1161 Environment, Safety and Health Manual, September 1988, which contained an abbreviated summary of applicable health and safety requirements, but there was no comprehensive occupational safety program document. Although there are now programs in existence defining safety and industrial hygiene requirements, the site has not communicated or implemented the programs.

The facility has been operating in a mode where accident and injury experience is low but the numbers of noncompliance issues were significant. Laboratory supervision and management interviewed indicated that prior to the 1988 Reactor TSA and the 1990 SNL, Livermore, Tiger Team Assessment, OSHA compliance was not believed to be a requirement at SNL, Albuquerque.

Significant Industrial Safety Program deficiencies were identified during the appraisal. Included was hoisting and rigging equipment, which did not fulfill OSHA requirements, employees working in machining areas without the specified

type of eye protection, forklifts in service with bent tines, and numerous electrical safety and code non-compliance issues. All these are long-standing issues. They have been in existence for a number of years, but SNL, Albuquerque, management has only recently begun an earnest effort toward rectification.

In an environment where there was no professional oversight, where regulatory compliance was not imposed, where accident and injury experience was low, and where program documentation was weak, the Laboratory has institutionalized the lack of compliance to health and safety requirements. Recognizing the situation, the Laboratory has now begun a determined effort to restructure itself to facilitate a heightened emphasis on safety and regulatory compliance.

As a part of the appraisal process, SNL, Albuquerque, conducted an extensive self-assessment during which it identified a series of institutional issues and conditions that it intends to rectify. Only three of the concerns presented in this portion of the appraisal was not addressed by SNL, Albuquerque, as a part of its self-assessment process. This concern was directed toward management failure to follow the more restrictive requirements when continuing activities were known not to be in compliance with mandatory OSHA requirements.

While the Laboratories' Occupational Safety Program was not in conformance with requirements mandated by DOE Orders, their overall safety record has been good in comparison to general industry. Deficiencies identified related to a historical lack of commitment to full compliance and excellence in their ES&H related programs. Recently developed subprograms should, when implemented, move the Laboratories in the desired direction.

4.5.17.2 Findings and Concerns

OS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Site and facility organization and administration should ensure effective implementation and control of the occupational safety program.

- FINDINGS:**
- SNL, Albuquerque, has not implemented a program which requires recurring internal audits or independent appraisals of its activities and facilities by safety professionals.
 - SNL, Albuquerque, personnel interviewed at facilities visited during the appraisal indicated that they did not receive visits or walkthroughs from safety professionals except as requested, or as a part of special activities such as the Self-Assessment.
 - See Concerns OA.2-2, QV.1-3, and FR.1-1.
 - This Concern was addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, has not implemented an independent internal audit or appraisal program to evaluate the effectiveness of the Occupational Safety Program, as required by DOE 5483.1A.
(OS.1-1)
(H2/C1)

- FINDINGS:**
- During an Industrial Safety Appraisal conducted July 18-22, 1988, by the AL, OSHA compliance deficiencies were identified including those relating to securing and guarding of machinery, nonavailability of eyewashes, and improperly guarded belts.
 - In the transmittal of the appraisal report to SNL, Albuquerque, AL requested that an action plan be submitted describing actions taken or proposed to satisfy the appraisal recommendations. This request did not reference or specify that the response should conform to the requirements of DOE 5483.1A.
 - The action plan submitted by SNL, Albuquerque, for the 1988 Industrial Safety Appraisal did not meet the requirements of DOE 5483.1A including:
 - The steps SNL, Albuquerque, would take to protect employees until compliance could be achieved.
 - How employees would be notified of the noncompliant conditions and the steps SNL, Albuquerque, would take to protect employees until compliance could be achieved.
 - How employees would be able to have input into the preparation of the action plan.

- There was no variance request facilitating continuation of operations impacted by the OSHA deficiencies identified during the appraisal.
- AL did not require that action plans, for OSHA deficiencies identified during the July 26 - August 3, 1989, Industrial Safety Appraisal or for the January 7-18, 1991, Industrial Safety Appraisal conform to the requirements of DOE 5483.1A.
- Action plans for abatement of OSHA noncompliance issues have not been required to observe the 1-year time restriction set forth in DOE 5483.1A.
- This Concern was not addressed in the AL Self-Assessment.

CONCERN:
(OS.1-2)
(H1/C1)

The Albuquerque Operations Office has not required Sandia National Laboratories, Albuquerque, to submit action plans for abatement of Occupational Safety and Health Act noncompliance issues which conform to DOE 5483.1A.

FINDINGS:

- For specific situations identified during the Appraisal, SNL, Albuquerque, supervision had authorized the continued use of hoisting and rigging equipment which had deficiencies identified during routine inspections. SNL, Albuquerque, employees interviewed revealed that this was a recurring situation.
- SNL, Albuquerque, continues the operation of laboratories and other areas wherein carcinogens, select carcinogens, reproductive toxins, and acutely toxic chemicals are used even though the Laboratory has not achieved compliance with 29 CFR 1910, Subpart Z.
- SNL, Albuquerque, has not required personnel in shop areas to wear eye protection with side shields in accordance with ANSI Z87.1. This was addressed in the January 1991 AL Occupational Safety Appraisal.
- A 1988 Industrial Safety Appraisal "recommended" that lathes, milling machines, and drill presses be provided with guarding and shields in accordance with OSHA requirements. This situation continues to be an issue at SNL, Albuquerque, as is documented in this Appraisal.
- Budgetary information reviewed during the course of the Appraisal indicated that full compliance with OSHA health standards would not be achieved until after Fiscal Year 1995.
- The Laboratory has not requested a variance, exception, or other form of relief from OSHA requirements made mandatory by DOE 5483.1A.
- Action plans are used to justify continued operation of noncompliant activities.

- This Concern was not addressed in the PTTSA.

CONCERN:
(OS.1.3)
(H1/C2)

Long-standing Occupational Safety and Health Administration compliance deficiencies were identified which Sandia National Laboratories, Albuquerque, is not managing in accordance with the most restrictive Department of Energy requirements.

FINDINGS:

- Professional health and safety personnel at SNL, Albuquerque, do not perform regular walkthroughs of activities conducted by service subcontractor personnel. Site visits by professional health and safety personnel are not required by the Safety Engineering Program document.
- Any health and safety oversight of service subcontractors is dependent on the individual initiative and expertise of the person who is responsible for the subcontract.
- The Standard Terms and Conditions for time and materials contracts does not require the submission of safety plans and, unless special requirements are added to the contract, a health and safety plan may not be submitted.
- Contract documentation does not contain a listing of hazards to which service personnel may be exposed.
- SNL, Albuquerque, has not established guidelines whereby service contractors are required to submit health and safety plans for review by professional health and safety personnel.
- This Concern was addressed in the PTTSA.

CONCERN:
(OS.1-4)
(H2/C1)

Professional health and safety oversight of service subcontractors, to ensure that activities conducted conform to DOE 5480.9, 29 CFR 1910.1200, and 29 CFR 1926.59, is not performed.

OS.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Procedures and documentation should provide appropriate direction, record generation, and support for the occupational safety program.

- FINDINGS:**
- The recently developed ES&H Safety Engineering Program document and the Industrial Hygiene Program document have not been approved by Laboratory management above the ES&H Directorate level and are not distributed to organizational elements outside ES&H.
 - MN471001, the new ES&H Manual, March 1991, addresses occupational safety and industrial hygiene issues in a summary style and does not address all elements at a level consistent with requirements mandated by applicable DOE Orders.
 - Key issues not addressed in the Safety Engineering Program document or Industrial Hygiene Program document include:
 - Fixed Ladders (29 CFR 1910.27)
 - Safety for diving operations (29 CFR 1910.401, 402)
 - Requirements for safety meetings
 - Industrial trucks (fork lifts) (29 CFR 1910.178)
 - Housekeeping plans (29 CFR 1910.1018(k)(4))
 - This Concern was addressed in the PT TSA.

CONCERN:
(OS.2-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, has not developed, communicated, or implemented an occupational safety program document or documents responsive to DOE 5483.1A or requirements mandated by DOE 5480.4.

- FINDINGS:**
- Although SNL, Albuquerque, contracts a number of services to outside vendors such as periodic crane inspections, the Laboratory does not have a program which provides ES&H oversight of those functions.
 - As has been documented by the Laboratory, frequent inspections of cranes and other lifting equipment have not been consistently performed in accordance with OSHA requirements.
 - For specific equipment items identified during the appraisal, SNL, Albuquerque, supervision had authorized the continued use of hoisting and rigging equipment which had deficiencies identified during routine inspections.

- Responsibility for the SNL, Albuquerque, hoisting and rigging program was claimed by multiple organizations depending on the location and application of the equipment.
- See Concerns WS.4-5 and MA.3-2.
- The Laboratory has not prepared or implemented requirements for critical, high-consequence or special high-consequence lifts.
- This Concern was partially addressed in the PTTSA.

CONCERN:
(OS.2-2)
(H2/C1)

The Laboratory has not defined or implemented a hoisting and rigging program which meets the requirements mandated by DOE 5480.4 and recommended by the Department of Energy, Hoisting and Rigging Manual.

FINDINGS:

- Safety and inspection requirements at SNL, Albuquerque, for fork lift trucks are not addressed in the Safety Engineering Program document.
- Maintenance inspections of fork trucks performed in the vehicle maintenance facility did not conform the requirements of ANSI B56.1b - 1988.
- A limited inspection of fork lifts present at SNL, Albuquerque, revealed that some lifts had bent tines, frayed hydraulic lines, and damaged tires.
- This Concern was not addressed in the PTTSA.

CONCERN:
(OS.2-3)
(H2/C2)

Sandia National Laboratories, Albuquerque, has not developed a comprehensive safety and maintenance program for fork trucks to ensure compliance with 29 CFR 1910.178.

FINDINGS:

- A number of fixed metal ladders were observed which did not meet OSHA criteria. Deficiencies included:
 - Improper modification of portable ladders to facilitate their use as fixed ladders.
 - Construction of fixed ladders from incompatible materials.
 - Access denial devices (doors/gates) which preclude the use of side rails.
 - Ladders in service which have been damaged.
 - Failure to keep the ladders maintained to control corrosion.
 - Newly designed and installed ladders which did not meet OSHA requirements have been placed into service.

- See Concern WS.4-1.
- This Concern was addressed in the PTTSA.

CONCERN:
(OS.2-4)
(H2/C1)

Sandia National Laboratories, Albuquerque, has not established a program to ensure that fixed ladders are designed and maintained in accordance with 29 CFR 1910.27.

FINDINGS:

- The Lock and Tag program in the Safety Engineering Program document has not been communicated to the Laboratory population.
- Laboratory personnel in different laboratories and facilities were using different lock/tag systems and tags of different designs.
- "Danger" tags were observed to be incorrectly used in place of "Caution" tags or other tags associated with the hoisting and rigging program.
- "Danger" tags were observed as being used in place of a lock in a location where accommodations for a lock were present.
- See Concerns OP.4-2 and MA.2-2.
- This Concern was addressed in the PTTSA.

CONCERN:

See Concern OP.4-2.

FINDINGS:

- A finding in the 1989 DOE Industrial Safety Appraisal indicated that review of construction designs by professional safety personnel should be enhanced.
- Recently completed construction projects were observed wherein ladders and railings had been designed and installed which were not in accordance with OSHA requirements.
- SNL, Albuquerque, does not require ES&H review of the design of all construction projects. Projects of less than \$150,000 were reported to be completed without a required ES&H design review.
- Laboratory exhaust ventilation design is not in conformance to the American Conference of Governmental Industrial Hygienists, Industrial Ventilation Manual, in many laboratory areas.
- See Concern SS.1-1.
- This Concern was partially addressed in the PTTSA.

CONCERN:
(OS.2-5)
(H2/C1)

The current construction project review system for projects costing less than \$150,000 at Sandia National Laboratories, Albuquerque, does not ensure that facilities will be designed in compliance with the Occupational Safety and Health Act, as required by DOE 5483.1A, DOE 5480.10, and those mandated by DOE 5480.4.

OS.4 SURVEILLANCE OF SAFETY CONCERNS

PERFORMANCE OBJECTIVE: Appropriate surveillance of activities should be conducted to measure safety performance and ensure the continued effectiveness of controls.

- FINDINGS:**
- Laboratory areas were observed wherein equipment generated electromagnetic and magnetic fields. There was no monitoring data available to quantify the fields to which personnel might be exposed or other data showing that monitoring was unnecessary.
 - A database of physical stressor measurements (noise, nonionizing radiation, heat, cold) was not available, which would facilitate estimates of physical stressors of significance in the workplace.
 - This Concern was documented in the PT TSA.

CONCERN: Within Sandia National Laboratories, Albuquerque, there is no
(OS.4-1) program or other documented requirement for periodic monitoring
(H1/C1) of physical stressors, as required by DOE 5480.10 and
DOE 5483.1A.

- FINDINGS:**
- Improper selection of eye protection was the subject of a finding in the January 1991 AL OSHA Appraisal.
 - Eye hazard areas were identified in various laboratory areas, machine shops, and carpenter shops areas where eye protection with side-shields was not required.
 - This Concern was partially addressed in the PT TSA.

CONCERN: Sandia National Laboratories, Albuquerque, does not conform to
(OS.4-2) ANSI Z87.1 recommendations regarding eye protection, as required
(H1/C1) by DOE 5480.4.

OS.5 PERSONNEL COMMUNICATION PROGRAM

PERFORMANCE OBJECTIVE: Site/facility personnel should be adequately informed of physical stresses that may be encountered in their work environment.

- FINDINGS:**
- A time and materials subcontractor was observed working in an area where recently measured inorganic arsenic levels exceeded the action level. This subcontractor had not been notified of OSHA requirements relating to potential exposure to inorganic arsenic or other acutely hazardous materials.
 - SNL, Albuquerque, has not performed initial monitoring or otherwise documented the potential for exposure to contaminants addressed by Subpart Z of 29 CFR 1910 or materials brought into the Carcinogen Control Program by DOE 5480.10 for most Laboratory areas.
 - See Concern IH.5-1.
 - This Concern was addressed in the PTTSA.

CONCERN: The Laboratory is not communicating chemical and physical hazards
(OS.5-1) information to subcontractor personnel, as required by
(H2/C1) 29 CFR 1910.1200, 29 CFR 1910.1450, or 29 CFR 1926.

4.5.18 Fire Protection

4.5.18.1 Overview

All seven performance objectives in the Fire Protection technical area were evaluated. A review was made of selected previous appraisals, audits, and assessments, annual reports, policies and manuals, and fire protection engineering surveys. Verification was made of fire system testing and inspections programs. Interviews were conducted with AL and SNL, Albuquerque, Fire Protection Engineers, Building Managers, Building Administrators, maintenance personnel and Kirtland Air Force Base Fire Department personnel.

Building tours were conducted in the following Bldgs: 957, 958, 959, 880, 6590, 6588, 6580, 6582, 605, 864, 858, 981, 983, 986, 970, and 841. Building tours were conducted with respective Building Managers, Building Administrators, or their ES&H Representatives, and Fire Protection Engineer.

Evaluation of fire protection performance objectives was based on DOE 5480.4, "Environmental Protection, Safety, and Health Protection Standards," and DOE 5480.7, "Fire Protection" (republished November 16, 1987). Other guidelines used were the DOE mandated NFPA Codes and the philosophy and standards of the fire insurance industry's "improved risk," as exemplified by the Factory Mutual System and Industrial Risk Insurers.

Major strengths of the Fire Protection Program are: (1) qualified Fire Protection Engineers are available in the SNL, Albuquerque, organizations but limited in number; (2) comprehensive fire protection building surveys have been conducted; (3) a well-trained professional non-DOE Fire Department is available for providing manual fire fighting and pre-fire planning; (4) review of line items construction plans to ensure that fire protection features are provided; and (5) automatic suppression systems, as needed, are provided in major buildings.

Life safety features are provided; however, not all facilities are in full compliance with the requirement of the NFPA 101, "Life Safety Code." The intent of the code is generally being met through the use of noncombustible construction, low combustible loading, and automatic sprinkler protection. The SNL, Albuquerque, water supplies are reliable and adequate.

The PTTSA evaluated the fire protection program area against the TSA performance objectives which were evaluated through responses, onsite observations, and interviews with fire protection staff and management. This Self-Assessment identified weaknesses in the area of training and records management. Fire protection maintenance and inspection supervisors and staff were found to lack training in the program requirements, and contractors were not sufficiently trained in their inspection, maintenance, repair, and reporting duties. The lack of a consistent, formal fire protection training program has resulted in a lack of understanding on the part of personnel regarding their authorities and responsibilities with respect to their Fire Protection Program assignments.

An SNL Corporate-level Fire Protection Program is being established to strengthen fire protection. This program will define corporate and site responsibilities, designate Corporate and Site Fire Marshals, and establish a

Corporate Fire Protection Council to oversee the program and implement policy. Increased formality of operations will increase program accountability, auditability, and effectiveness.

Additional program weaknesses were found during this inspection in the following areas: (1) fire protection inspection and surveys are not performed on schedule; (2) fire protection equipment is not being inspected as required; (3) lack of AL inspections; (4) lack of a formal system to handle reviews, questions, and deviations from standards; and (5) lack of a program to ensure that all projects are reviewed by the Fire Protection Engineering staff.

Fire Protection Engineering has programs that cover the basic parts of inspection, testing, and maintenance of the fire protection systems and their involvement in many of the new and ongoing projects. However, these programs are not at the level of compliance required by the Department of Energy Orders and industry standards. Fire Protection Engineering does not cover many of the needed areas of loss prevention. The problems of the programs were noted in the PTTSA, and the proposed action plan should bring the Fire Protection Engineering Programs into compliance.

The corrective action plan addresses the SNL, Albuquerque, concerns that were noted. This plan will only correct the concerns as long as the needed and required resources and policies are continued.

4.5.18.2 Findings and Concerns

FP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Fire Protection organization and administration should ensure the effective implementation and control of fire protection equipment and activities.

- FINDINGS:**
- PG470018.0, "SNL Corporate Fire Protection Program," while approved on February 15, 1991, is not scheduled to be implemented in a timely manner.
 - The SNL, Albuquerque, buildings inspections/evaluations to determine the Maximum Possible Fire Loss and Maximum Credible Loss Potentials are over 2 years behind schedule.
 - Inspections of fire protection equipment and systems are behind schedule.
 - Hydrostatic tests of fire extinguishers are out of date. (See Concern WS.4-11.)
 - Facilities Loss Prevention Inspections (fire hazards analysis) are late; some are more than 2 years late.
 - Inspection of the fire detection and alarm systems, which is to be done every 60 days, takes more than 90 days to complete.
 - This Concern was addressed in the PTSA.

CONCERN: Sandia National Laboratories, Albuquerque, Fire Protection Engineering staff does not provide the level of inspection and surveys at the frequency required by DOE 5480.7 and the "improved risk" level of fire protection.
(FP.1-1)
(H2/C1)

- FINDINGS:**
- A Factory Mutual followup inspection was made in 1989.
 - The last fire protection appraisal conducted by AL was in July 1988.
 - This Concern was not noted in the AL Self-Assessment.

CONCERN: The Albuquerque Operations Office is not conducting periodic fire protection appraisals, as required by DOE 5480.7.
(FP.1-2)
(H2/C1)

FP.2 LIFE PROTECTION

PERFORMANCE OBJECTIVE: All facilities onsite should provide adequate life safety provisions against the effects of fire.

- FINDINGS:**
- Life safety requirements as addressed in NFPA 101 have not been provided in some SNL, Albuquerque, buildings. For example, Bldg. 880 lacks the emergency exits required by this code in the Mass Tape Storage Room.
 - Lack of adequate exits were also noted from the duct level of Bldg. 858; one exit goes to the roof and there is no egress off the roof, as the door back to the duct level is locked and a ladder from the roof to the ground has not been installed.
 - See Concerns WS.4-2 and IH.5-3.
 - This Concern was addressed in the PTTSA.

CONCERN: NFPA 101, "Life Safety Code," requirements are not being met, as
(FP.2-1) required by DOE 5480.7.
(H2/C1)

FP.4 IMPAIRMENT OF OPERATIONS

PERFORMANCE OBJECTIVE: The site should not be vulnerable to being shut down for an unacceptable period as the result of a credible fire.

- FINDINGS:**
- Bldg. 858 could suffer a credible fire due to the combustible storage under the acid duct (fiberglass-reinforced plastic) and shut down the operations for more than 6 months.
 - The lack of automatic sprinkler protection inside of the acid duct system could allow a fire and smoke to spread throughout the clean room and shut down the operations for up to 6 months. Automatic sprinklers are recommended in the ducts by Factory Mutual Loss Prevention Data Sheets 1-56 and 7-78.
 - The cause of this Concern was covered in the PT TSA.
 - This Concern was not addressed in the PT TSA.

CONCERN: The loss of the acid duct system in Building 858 due to a
(FP.4-1) credible fire could shut down the clean room operations for more
(H2/C1) than 6 months contrary to the fire loss criteria of DOE 5480.7.

- FINDINGS:**
- A Fire Protection Engineering memorandum dated April 29, 1991, listed the priority of 90 buildings needing new or upgraded automatic sprinkler systems. Recommendations for needed improvements to meet DOE 5480.7 were dated as early as 1987. Completion of these needed improvements are not being done in a timely manner. Buildings that require new automatic sprinkler systems are smaller buildings, many of which are portable type structures. These unsprinkled buildings are a serious fire exposure and do not meet the requirements of DOE/EV-0043. About 10 buildings have been noted that need improvements to the automatic sprinkler systems to provide required protection in selected areas per DOE 5480.7 and DOE 6430.1A. (See Concern MS.3-2.)
 - This Concern was addressed in the PT TSA.

CONCERN: Buildings have been identified by Sandia National Laboratories,
(FP.4-2) Albuquerque, that require improvements in the fire protection
(H2/C1) system to ensure that maximum credible losses are kept to the
 lowest acceptable value per DOE 5480.7, DOE 6430.1A, and
 DOE/EV-0043.

FP.5 PROPERTY PROTECTION

PERFORMANCE OBJECTIVE: A maximum credible fire, as defined in DOE 5480.7, Section 6.f, should not result in an unacceptable property loss.

- FINDINGS:**
- The SNL, Albuquerque, building inspections/evaluations to determine the Maximum Possible Fire Loss and Maximum Credible Loss Potentials are more than 2 years behind schedule.
 - Fire Protection Engineering did not review the installation of the Cray Y-MP Computer in Bldg. 880 to determine what the Maximum Possible or Maximum Credible Fire Loss potentials were.
 - This Concern was addressed in the PT TSA.

CONCERN: Fire Protection Engineering has not determined the Fire Loss
(FP.5-1) Potential (Maximum Possible and Maximum Credible) for the
(H2/C1) installation of the new Cray Computer in Bldg. 880, as required
by DOE 5480.7. (See Concern FP.1-1.)

FP.6 FIRE DEPARTMENT OPERATIONS

PERFORMANCE OBJECTIVE: The Fire Department should have the capacity to promptly terminate and mitigate the effects of a fire in a safe and effective manner.

- FINDINGS:**
- A 1990 Interdepartmental Support Agreement between AL and Kirtland Air Force Base (KAFB) (Agreement No. DE-AI04-90AL55855) provides all areas with fire fighting support, inspection, and prefire planning in accordance with Air Force Regulation 92-1 and not NFPA standards.
 - The KAFB Fire Department is making inspections and updating the prefire plans of the SNL, Albuquerque, buildings on a 3-year frequency, as noted in the above contract.
 - This Concern was not addressed in the AL Self-Assessment.

CONCERN: Inspection and prefire plan updates are not being done at the frequency required by DOE 5480.7 and the "improved risk" level of fire protection. (See Concerns CS.5-2 and EP.2-2.)
(FP.6-1)
(H2/C1)

FP.7**PROGRAM IMPLEMENTATION**

PERFORMANCE OBJECTIVE: A fire protection engineering program should be in place to effectively provide and maintain an "improved risk" level of fire protection.

- FINDINGS:**
- The SNL, Albuquerque, Fire Protection Engineering Program is not required to review the planning or design of all new projects. For example:
 - There is no evidence that the fire exposure to the Steam Plant, Bldg. 605, was evaluated per Factory Mutual Loss Prevention Data Sheet 5-4 for the transformer fluid changeout.
 - A new radio frequency screen room is being installed in Bldg. 986. This installation was not reviewed by Fire Protection Engineering for compliance to codes and standards.
 - Fire Protection Engineering currently is required to review line items for fire protection concerns.
 - This Concern was addressed in the PTTSA.

CONCERN:
(FP.7-1)
(H2/C1)

The Fire Protection Engineering Program is not required to review and approve all new projects, building modifications, and renovations, as required by DOE 5480.7. (See Concerns OS.2-5, SS.1-1, FR.3-1, TS.3-2, and FP.5-1.)

- FINDINGS:**
- At the Hot Cell Facility in Technical Area V, two fire protection valves for the nitrogen extinguishing system were found without locks, seals, or electrical supervision (tamper switch).
 - Annual loop tests of the fire protection underground mains are not being performed as recommended by "improved risk" level of fire protection.
 - Fire extinguishers and extinguishing systems are not being inspected, tested, or maintained in accordance with NFPA. (See Concern WS.4-11.)
 - Fire protection control valves are considered by DOE to be sealed when locks are of the breakable shackle type. According to the DOE Fire Protection Manual, breakable shackle locks are considered to be equal to that of sealed valves and they must be inspected weekly per NFPA 13A, rather than monthly as currently being done.
 - This Concern was addressed in the PTTSA.

CONCERN:
(FP.7-2)
(H2/C1)

Fire protection systems and equipment are not inspected, tested, and maintained in full compliance with National Fire Protection Association Codes and Standards and "improved risk" level of fire protection, as required by DOE 5480.4 and DOE 5480.7.

FINDINGS:

- Documented monthly loss prevention inspections are not being conducted as recommended by the "improved risk" level of fire protection.
- A documented fire barrier inspection/maintenance program as recommended by the "improved risk" level of fire protection does not exist. (See Concern WS.4-1.)
- A formal system has not been established to track and document completion of fire protection findings, recommendations, and other items that result from Fire Protection Engineering inspections and surveys, fire protection system inspections, and other audits and appraisals.
- An annual documented review is not made of the fire protection program as recommended by the "improved risk" level of fire protection.
- This Concern was addressed in the PTTSA.

CONCERN:
(FP.7-3)
(H2/C1)

A formal system has not been established to meet the "improved risk" level of fire protection, as required by DOE 5480.4 and DOE 5480.7.

4.5.19 Medical Services

4.5.19.1 Overview

The evaluation of the SNL, Albuquerque, Occupational Medical Program was conducted using all Medical Services performance objectives. The evaluation process consisted of interviews with the Medical Director, staff physicians, nurses, and Directors of Administration, Employee Assistance Programs, Laboratory, and the Wellness Program, which is called "Total Life Concepts" (TLC). The completed Occupational Medical Program Manual was reviewed as well as completed, unapproved procedures and procedures that were still in the formative stage. Work in progress was observed while making a thorough inspection of the medical facility. Medical equipment was surveyed and the records of equipment calibrations and the training of operators was verified. A random sample of employee medical records was reviewed. Other health and safety professionals were interviewed to determine their interaction with the medical staff and the extent and effectiveness of combined efforts in addressing health and safety issues. Management representatives interviewed were the Vice President of Administration and the Directors of the Benefits and Labor Relations Departments. Representatives from all three unions at SNL, Albuquerque, were interviewed as well as several SNL, Albuquerque, employees.

The Occupational Medical Director is well trained and is board certified in Occupational Medicine. He is respected both as a physician and an administrator by SNL, Albuquerque, management as well as the Medical Department employees. The medical staff is well trained and existing training programs are excellent. The staff appears to be working at near maximum capacity and is behind schedule in performing periodic examinations. If the needed increased emphasis on medical surveillance programs and emergency medical coverage at distant sites are implemented, more nurses and physicians will be required.

SNL, Albuquerque, has a good medical program that has been operating more on the principles of occupational and preventive medicine practices than adherence to DOE or OSHA standards. Medical surveillance of employees exposed to workplace hazards is deficient in depth and scope. It has been accomplished through the use of fitness-for-duty examinations and age-based periodic examinations. The resolution of this deficiency requires action outside the Medical Directorate by the development of a system, whereby hazards and the employees exposed to them, are identified and the Medical Directorate is supplied this information so the appropriate DOE, OSHA, or National Institute Occupational Safety and Health required employee medical surveillance examinations can be performed.

There are two programs within the Medical Directorate that deserve special recognition. These are the Sickness Absence Management Plan and the TLC Program. The Sickness Absence Management Plan promotes attendance at work using structured procedures and utilizes the expertise of physicians and nurses in making medical decisions, and when necessary by contacting the employee's personal physician, on the appropriateness of absences. All absences are managed and pay approved by the Administration Section of the Medical Directorate. The result is a good work ethic and low absentee rate. The program is unique to this site. The TLC Program is comprehensive and is

used by a large segment of the SNL, Albuquerque, employee population. The unique feature of the program is the inclusion of retirees and employees' dependents and targeting them with special programs. This is an excellent method to present preventive medicine subjects to an audience that accounts for a high percentage of health care expenditures.

SNL, Albuquerque, is fortunate to have the quality direction and staff it has in the Occupational Medical Directorate. Although there are deficiencies as noted in the findings, this group has the potential to become a superior Occupational Medical Program.

The PTSA identified the major deficiencies that are contained in the Medical Services review of the SNL, Albuquerque, Medical Directorate. The Self-Assessment was not of sufficient depth to investigate many medical aspects of the medical program such as the content of medical records, correctness of medical examinations, treatment procedures, and the training of the medical staff.

4.5.19.2 Findings and Concerns

MS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Site and facility organization and administration should ensure effective implementation and control of the medical services program.

- FINDINGS:**
- Information on present or anticipated employee exposure to toxic materials that might result from changes in existing processes or proposed new processes is not provided to the Medical Director, as required in DOE 5480.8, Section 7.a.(2)(a)3.
 - A system does not exist for the identification of toxic materials and the employees who may be exposed to them above known action levels. This information is not reported to the Medical Directorate so required medical surveillance examinations can be performed, as required in DOE 5480.8, Section 7.a.(3)(e).
 - Sensitive medical and Employee Assistance Program records maintained in Bldg. 831 are not protected from fire. A 1989 Headquarters, DOE, Medical Audit also cited this deficiency.
 - The emergency treatment room is small and requires removal of some equipment in order to treat a patient with a cardiac emergency. A 1989 Headquarters, DOE, Medical Audit addressed this issue.
 - Remote sites at SNL, Albuquerque, need additional coverage to respond to medical emergencies as some sites are 20 minutes from the Medical Directorate and the available emergency vehicle in Technical Area III is not operated with trained personnel.
 - The PTTSA addressed this issue.

CONCERN: Sandia National Laboratories, Albuquerque, has not implemented an
(MS.1-1) Occupational Medical Program or established support systems of
(H2/C1) sufficient depth and scope to comply with DOE 5480.8. (See
TS.2-1, FP.4-2, and OA.7-3.)

- FINDINGS:**
- Arrangements with offsite providers of medical services to SNL, Albuquerque, employees lack a formal contract that outlines the specific medical services to be provided.
 - The PTTSA addressed this issue.

CONCERN:
(MS.1-2)
(H2/C1)

Medical services provided by contractors for Sandia National Laboratories, Albuquerque, employees offsite lack the direction and documentation to assure management that medical services are being uniformly and efficiently delivered, in accordance with DOE 5480.8.

MS.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Procedures and documentation should provide appropriate direction, record generation, and support of the medical services for the facility and site.

- FINDINGS:**
- The Medical Directorate procedure relating to medical surveillance of asbestos workers did not follow the requirements of 29 CFR 1910.1001; and 29 CFR 1926.58. The frequency and content of examinations were incorrect.
 - Employees of the site are not provided a copy of their medical record consistent with requirements of 29 CFR 1910.20 "Access to Employee Exposure and Medical Records."
 - The QA Program is new and has not been fully developed or implemented. Anticipated completion date is 1992.
 - Medical procedures are being developed (few existed previously) by Medical Department employees. The Medical Director will review, approve, and assemble their work into the Medical Directorate Procedure Manual, which will relate to the new Occupational Medicine Program Manual. Anticipated completion date is October 1991.
 - There are no standing orders for the nursing staff.
 - QA of work procedures or work in progress is not of sufficient depth and scope; an example would be the lack of an outside reference laboratory like the American College of Pathologist or the Armed Forces Institute of Pathology to monitor the quality of the work in the clinical laboratory.
 - The PTTSA addressed QA and medical procedures.

CONCERN: The Sandia National Laboratories, Albuquerque, Medical
(MS.2-1) Directorate, lacks the documentation to assure management that
(H2/C1) medical services are being uniformly and efficiently delivered,
 in accordance with DOE 5480.8. (See Concern QV.1-1.)

MS.3 MEDICAL TREATMENT

PERFORMANCE OBJECTIVE: Medical treatment should be available and provided by qualified, competent staff, and adequate facilities should be available.

- FINDINGS:**
- The number of nurses on the staff is two short of meeting the requirements of DOE 5480.8.
 - The number of physicians on the staff is one short of meeting the requirements of DOE 5480.8.
 - The Medical Examiner's staff is not sufficient to meet the periodic physical and medical surveillance examination program mandated by DOE 5480.8.
 - The PTTSA addressed this issue.

CONCERN: The medical staff needed to support the site and facility are not
(MS.3-1) available and trained, as required in DOE 5480.8, Section 7.8.F.
(H2/C1)

- FINDINGS:**
- Sensitive medical and Employee Assistance Program records maintained in Bldg. 831 are not protected from fire.
 - Emergency medical coverage at remote sites needs to be surveyed for its adequacy as some sites are 20 minutes away from the Medical Building, and the emergency vehicle in Technical Area III does not have personnel adequately trained.
 - The Emergency Treatment Room is small and requires removal of some equipment to treat a patient with a cardiac emergency.
 - The PTTSA addressed this issue.

CONCERN: The medical facilities and the medical equipment needed to
(MS.3-2) support the site are not of sufficient depth and scope to meet
(H2/C1) the requirements of DOE 5480.8., Section 7.g. (See FP.4-2.)

- FINDINGS:**
- The Medical Directorate is not informed of the results of food establishment inspections performed either by the SNL, Albuquerque, Industrial Hygiene Department professionals or by the vendor's own inspectors. SNL, Albuquerque, physicians trained in this type of evaluation do not make periodic walkthrough inspections.
 - The PTTSA did not address this issue.

CONCERN: Special medical assessments are not made to prevent recurring
(MS.3-3) medical occurrences associated with cooking and serving food in
(H2/C3) food vending areas.

MS.4 REVIEW AND AUDIT

PERFORMANCE OBJECTIVE: Policies, procedures, and practices for medical services should be reviewed and audited periodically to ensure continued effectiveness of the medical services.

- FINDINGS:**
- Periodic emergency site drills involving the Medical Directorate were not performed between October 1988 and January 1991.
 - The integration of SNL, Albuquerque-Kirtland Air Force Base facilities, staffs, and ambulance services as well as triage and communication capabilities in a multicasualty disaster have not been recently tested by a large scale realistic drill.
 - The PT TSA did not address this issue.

CONCERN: The Medical Directorate personnel have not been included in
(MS.4-1) emergency exercise drills sufficiently to ensure that high
(H2/C1) quality care is provided in all types of emergencies, as required
 in DOE 5480.8, Section 7.e.

MS.5 PERSONNEL COMMUNICATION PROGRAM

PERFORMANCE OBJECTIVE: Site/facility personnel should be adequately informed of the medical hazards that may be encountered and of the medical services that are available.

- FINDINGS:**
- Employees of the site are not provided a copy of their medical record consistent with requirements of 29 CFR 1910.20.
 - Employees have not annually been informed of their right of access to medical records, as required by 29 CFR 1910.20.
 - The AL Self-Assessment did address this issue.
 - The PTTSA did not address this issue.

CONCERN: Sandia National Laboratories, Albuquerque, management has not implemented all requirements of 29 CFR 1910.20.
(MS.5-1)
(H2/C1)

4.5.20 Explosives Safety

4.5.20.1 Overview

During this appraisal, all seven of the Explosives Safety performance objectives were addressed. The explosives safety appraisal examined activities storing, performing operations on or with, and handling or transporting explosives. The appraisal was concerned with the environment in which personnel either stored or handled explosives to ensure that the explosives were not exposed to harmful stimuli and that personnel had been afforded the required levels of protection. The activities visited included the Powder Gun and Parachute Laboratory activities in Engineering Sciences (Org. 1500); explosives storage, Thermal Battery Research, development, assembly, and testing activities in Components (Org. 2500); the 6000 Igloo Area and storage in the Manzano Area in Security and Facility Support Services (Org. 3400); the hi-bay and lo-bay activities in Bldg. 809 in Weapon Development (Org. 5100); 9940 Test Site in Nuclear Energy Technology (Org. 6400); the Water Impact Facility, Drop Tower, Light Initiated High Explosive, Sprint Assembly Building, Rocket Sled Track, Shock Tube Complex, Terminal Ballistic Facility, Cablesite Complex, and associate explosives assembly and storage facilities in Development Testing (Org. 7500); and Bldg. 808 and explosives assembly in Site 9930 Explosives Application Laboratory in Exploratory Systems (Org. 9000).

The self-assessment efforts of SNL, Albuquerque, and AL were evaluated for their coverage of explosives safety matters. Neither the SNL, Albuquerque, SAND90-2827, "Pre-Tiger Team Self-Assessment Report," January 1991, nor the "DOE-AL Self-Assessment Report," April 1991, contained any findings or concerns relating to explosives operations. However, SNL, Albuquerque, had experienced nine reportable occurrences related to explosives operations in the past 2 years. As a result of these occurrences, AL informed SNL, Albuquerque, of their intention to perform an external appraisal of explosives operations at SNL, Albuquerque. Upon request, SNL, Albuquerque, was allowed time to perform internal appraisals before the AL appraisal. The last appraisal involving reportable occurrences was completed on April 16, 1991; therefore, AL has not initiated their planned effort. The SNL, Albuquerque, appraisals of organizations that had reportable occurrences were conducted by ad hoc Independent Explosives Operations Appraisal Teams (IEOAT). Other organizations which had no reportable occurrences were self-appraised by teams appointed by their line vice presidents. The reports published by the IEOAT were reviewed in detail, and onsite visits of activities which had been appraised reinforced much of the concerns expressed by the IEOATs. The IEOATs identified significant findings and concerns about activities involving explosives at SNL, Albuquerque. These findings illustrated concerns as to the adequacy of training throughout the Laboratory complex for explosives operations and the need for additional oversight of SNL, Albuquerque, explosives operations by ES&H professionals. Corrective action plans are being prepared, and in some instances, corrective actions have already been accomplished. At present, the IEOATs are a one-time effort and will be disbanded.

The overall Explosive Safety Program is satisfactory; however, several areas need management attention at SNL, Albuquerque. Explosives storage, assembly, testing, and handling operations are being performed by a work force with

years of experience in the specific types of operations being performed. There was no formal effort to establish a continuing training program. ES&H professional staff, knowledgeable in explosives safety matters, are not providing independent appraisal or day-to-day oversight of explosives operations. Storage magazines contain ammunition and explosives manufactured as much as 30 years ago; there was no program to analyze the explosives and ammunition stockage to determine stability and suitability for continued storage.

4.5.20.2 Findings and Concerns

ES.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Management organization and administration should ensure the effective implementation and control of the explosives safety program.

- FINDINGS:**
- In addition to safety training, the SAND88-1161, Environment, Safety, and Health Manual, September 1988, indicated that safety meetings should be held at least every 6 months. Several explosives-operating facilities at SNL, Albuquerque, have found that effective communication requires more frequent safety meetings.
 - Safety meetings held on an infrequent basis do not provide for effective communications of explosives safety matters between operating personnel and management.
 - See Concern OA.1-5.
 - This Concern was not addressed in the PT TSA.

CONCERN: Safety meetings in which explosives safety matters are discussed (ES.1-1) are held too infrequently.
(H2/C2)

- FINDINGS:**
- SNL, Albuquerque, has had no ongoing programs for ES&H appraisals of explosives operations. Operating activities have commented that the oversight support in explosives safety matters has been infrequent. The numbers and types of findings noted by ad hoc SNL, Albuquerque, Independent Explosives Operations Appraisal Teams substantiate a lack of oversight by qualified explosives safety personnel.
 - Safety Engineering Division (Org. 3215) did not accomplish frequent oversight of operating activities. It has only two safety engineers who are responsible primarily for oversight of industrial safety during explosives operating, storing, and handling activities; explosives safety is considered an element of industrial safety at SNL, Albuquerque. Two other safety engineers also have explosives safety experience and can be used to support the efforts of the primary safety engineers.
 - See Concerns OA.2-2, FR.1-2, and QV.1-3.
 - This Concern was not addressed in the PT TSA; however, the SNL, Albuquerque, Independent Explosives Operations Appraisal Team had identified these issues.

CONCERN: Sandia National Laboratories, Albuquerque, safety personnel do (ES.1-2) not provide environment, safety, and health internal appraisals
(H2/C2) or frequent oversight of explosives activities.

FINDINGS:

- The KAO does not have a safety engineer qualified to provide oversight for explosives operations.
- This Concern was not addressed in the AL Self-Assessment.

**CONCERN:
(ES.1-3)
(H2/C2)**

The Kirtland Area Office safety personnel do not provide frequent environment, safety, and health oversight of explosives activities at Sandia National Laboratories, Albuquerque.

ES.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Procedures and documentation should provide appropriate direction, record generation, and support for the explosives safety program.

- FINDINGS:**
- Line management at SNL, Albuquerque, is not responsible for approving the introduction of a new explosive energetic material. The approval process rests in the Ad Hoc Sensitivity Review Committee chaired by a representative from the Safety Engineering Division.
 - Page 9C-6, Chapter 9 of the SNL, Albuquerque, Environment, Safety and Health Manual, to be effective June 1991, charges the Sandia Explosives Safety Committee to fulfill the requirements of the Explosives Development Committee at SNL, Albuquerque; however, the charter of this committee as assigned in paragraph B.1.2 of Chapter 1 does not contain this requirement.
 - This Concern was not addressed in the PTSA.

CONCERN: The Ad Hoc Sensitivity Review Committee for explosives safety
(ES.2-1) does not provide for line management concurrence for introduction
(H2/C2) of new explosive energetic material.

ES.4 EXPLOSIVES SAFETY TRAINING

PERFORMANCE OBJECTIVE: Explosive safety training programs have been established and implemented to ensure compliance with DOE-prescribed standards.

- FINDINGS:**
- Job descriptions for operating personnel were not specific in that information needed for preparation of a formal explosives training program was not available.
 - An on-the-job training program for explosives operators had not been documented as to requirements, material to be included, and responsibility for conduct of the program.
 - There was no documented explosives training program to provide initial, qualification, or refresher training for personnel assigned to explosives operations or operating any explosives-carrying vehicle.
 - See Concern TC.1-2.
 - This Concern was not addressed in the PT TSA; however, the SNL, Albuquerque, Independent Explosives Operations Appraisal Team had identified these issues.

CONCERN: The Sandia National Laboratories, Albuquerque, explosives training and qualification program does not comply with the requirements, scope, and responsibilities specified by Chapter V, DOE/EV/06194, Explosives Safety Manual.
(ES.4-1)
(H2/C1)

ES.5 EXPLOSIVES OPERATIONS

PERFORMANCE OBJECTIVE: Explosives operational activities should be conducted in a manner that is both safe and reliable.

- FINDINGS:**
- Random displaying of placards listing the permitted explosives and personnel limits in explosives-operating areas could confuse transient personnel as to the areas in which explosives were present or permitted.
 - This Concern was not addressed in the PTTSA; however, the SNL, Albuquerque, Independent Explosives Operations Appraisal Team had identified this issue.

CONCERN: There is no procedure or systematic method for posting of
(ES.5-1) placards listing explosives and personnel limits at explosives-
(H2/C2) operating areas.

ES.7 TRANSPORTATION, HANDLING, AND STORAGE OF MUNITIONS

PERFORMANCE OBJECTIVE: The transportation, handling, and storage of explosives should conform to all DOE prescribed safety standards.

- FINDINGS:**
- In Technical Area II, explosives with less potential for hazard were incorrectly stored with incompatible and potentially more hazardous explosives (i.e., items in Storage Compatibility Group D were stored with items in Compatibility Groups A and L).
 - This Concern was not addressed in the PTTSA; however, the SNL, Albuquerque, Independent Explosives Operations Appraisal Team had identified this issue.

CONCERN: Explosives storage was not in compliance with storage
(ES.7-1) compatibility requirements listed in Chapter II, Paragraph 17.4,
(H1/C1) DOE/EV/06194, Explosives Safety Manual.

- FINDINGS:**
- SNL, Albuquerque, had quantities of bulk propellant, manufactured more than 10 years ago, in storage and service magazines. There was neither an SNL, Albuquerque, surveillance program to analyze the propellant for stabilizer depletion nor had SNL, Albuquerque, obtained surveillance data from Department of Defense (DOD) Components for those lots of propellant still in service.
 - The storage magazines used by SNL, Albuquerque, at the Manzano Area contained rocket motors and other ammunition items which had been manufactured in the 1950s, 1960s, and 1970s. Storage review intervals based upon stability data had not been established for these items. Many of the items had already exceeded known DOD shelf life.
 - Page 9C-6, Chapter 9 of the SNL, Albuquerque, Environment, Safety and Health Manual, to be effective June 1991, indicated that the Sandia Explosives Safety Committee would provide assistance in developing a storage review program; however, the charter of this committee as assigned in Paragraph B.1.2 of Chapter 1 does not contain this requirement.
 - This Concern was not addressed in the PTTSA; however, the SNL, Albuquerque, Independent Explosives Operations Appraisal Team had identified these issues.

CONCERN: A Sandia National Laboratories, Albuquerque, Storage Review
(ES.7-2) Program, as required by Paragraph 17.3, Chapter II, DOE/EV/06194,
(H1/C1) Explosives Safety Manual, has not been established.

4.5.21 Firearms Safety

4.5.21.1 Overview

The appraisal of the Firearms Safety technical area included SNL, Albuquerque, Operational Security Services Department and other identified operations using firearms within SNL, Albuquerque. All of the seven Firearms Safety performance objectives were addressed in appraising SNL, Albuquerque, Operational Security Services Department. The performance objective regarding training exercises was not applied to the SNL, Albuquerque, Ballistic Facility (Bldg. 6750) operated by the Dynamic Loads and Facilities Development Division (Org. 7531), as security operations and associated training are not conducted. The other six performance objectives were addressed as appropriate to research and development operations. The use of firearms by a research and development group with SNL, Albuquerque, Nuclear Security Systems (Org. 5200) was reported to have been discontinued and the performance objectives were not applied to their operations.

The appraisal process included visits to facilities where firearms are routinely issued/returned, cleaned, loaded/unloaded; where firearms or munitions are stored; tours made of firing ranges where firearms training or testing is conducted. Representative duty posts and vehicles in which firearms are stored or transported were examined and shift changes were observed. Interviews were conducted with management, security inspectors, training personnel, safety and health specialists, and engineering/technical personnel involved with firearms testing or research activities. Policies, procedures, lesson plans, training records, and certification associated with firearms were reviewed. Because the SNL, Albuquerque, Protective Force uses the DOE CTA Live Fire Range, the facilities there were reviewed for the impact on the safety and health of these employees. The SNL, Albuquerque, Terminal Ballistics Facility, the Patrol Headquarters (North and South) and munitions storage bunkers were included.

The SNL, Albuquerque, Operational Security Services Department Protective Force Firearms Safety Program is basically well-documented and recent upgrades have brought it close to meeting the requirements of DOE 5480.16. The organization and administration of the SNL, Albuquerque, Operational Security Services Department Firearms Safety Program and their firearms training programs are well-defined and effectively implemented.

However, DOE 5480.16 and AL 5480.16 have been applied only to security operations. Therefore, research and development, testing, and other nonsecurity firearms operations are not addressed in the SNL, Albuquerque, Firearms Safety Program. The Purpose and Scope of DOE 5480.16 apply to the safe use of firearms with no limitations; however, portions limit the application to use of firearms in security operations. The DOE Firearms Safety Committee reached a consensus in August 1990 that DOE 5480.16 is not limited to protective uses of firearms. It is not reasonable to require compliance with all sections of DOE 5480.16; however, good firearms safety practice mandates that portions of DOE 5480.16 be used to achieve some consistency in ensuring safe use of firearms for different projects. Firearms operations and facilities of all types are expected to be evaluated to determine and minimize risks. The PTTSA had no findings or concerns relating to the SNL, Albuquerque, Firearms Safety Programs and did not address use of

firearms by other organizations within SNL, Albuquerque, because of their interpretation of the DOE Order.

The organization and administration of the Firearms Safety Program has focused on the SNL, Albuquerque, Protective Force. The organization and administration criteria are currently being met for that part of the organization. However, the research and development or testing operations within SNL, Albuquerque, which use firearms (small arms only are addressed in DOE 5480.16) have not implemented Firearms Safety Programs.

While the SNL, Albuquerque, Operational Security Services Department Firearms Safety Program is generally well-documented, in some cases operations are not conducted entirely as described in procedures. The SNL, Albuquerque, Terminal Ballistic Facility Operations are not currently documented in accordance with all applicable aspects of DOE 5480.16. Appraisals have been conducted as required of the SNL, Albuquerque, Operational Security Services Department facilities and operations, although some specific hazards and practices have not been identified. Firearms safety appraisals of facilities and operations other than security have not been conducted.

In the past, results of airborne lead monitoring conducted by the DOE CTA were accepted. It was recognized by SNL, Albuquerque, Operational Security Services Department that the requirement for quarterly airborne lead monitoring was not being met. SNL, Albuquerque, Operational Security Services Department took the proactive initiative to request airborne lead monitoring to be conducted by SNL, Albuquerque, Industrial Hygienists.

The Firearms Safety Training Program of the SNL, Albuquerque, Operational Security Services Department is generally well-documented. Lesson plans are clearly organized and specifically incorporate requirements of DOE 5480.16. Testing based on the lesson plans includes firearms safety and a separate safety review with testing conducted annually. Training requirements have not been developed for personnel involved in the operations at the Terminal Ballistics Facility. A risk analysis or SAR is required for all firing ranges. Testing and other research and development operations have been conducted with firearms on both the indoor and outdoor firing ranges without the required analysis. The absence of such an analysis is the most serious concern with the operations at this facility.

The firing range used by the SNL, Albuquerque, Protective Force for training and qualification is operated by the DOE CTA. No system has been established to address safety hazards which may impact SNL, Albuquerque, personnel. Without a procedure or policy established by higher levels of management, any input to the CTA on facility safety concerns may not be recognized and addressed.

The SNL, Albuquerque, requirements and procedures for firearms training exercises are documented and established. However, control and documentation of training exercises using paint gun firearms simulators for such training was found to be incomplete. Training exercises were conducted without the knowledge or approval of safety or security personnel as required.

Transportation, handling, storage, and use of munitions is generally in compliance with requirements. Offsite storage and transportation of munitions was not specifically addressed for SNL, Albuquerque, Protective Force personnel who take ammunition home with them for potential emergency security responses.

4.5.21.2 Findings and Concerns

FS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Security and safety organization and administration should ensure the effective implementation and control of the firearms safety program.

- FINDINGS:**
- Firearms have been used in the past within Nuclear Security Systems (Org. 5200) without an established Firearms Safety Program.
 - Small arms are used by SNL, Albuquerque, Dynamic Loads and Facilities Development Division at the Terminal Ballistic Facility and testing which has been conducted in the past by SNL, Albuquerque, Org. 5200 have not been in compliance with applicable portions of DOE 5480.16 or AL 5480.16, such as annual internal appraisals or audits and risk analyses.
 - Contrary to the scope statement of DOE 5480.16, the scope of AL 5480.16 has been interpreted by SNL, Albuquerque, to apply only to security operations.
 - The following Concern was not addressed in the PT TSA.

CONCERN:
(FS.1-1)
(H2/C2) Sandia National Laboratories, Albuquerque, is not in compliance with the application of DOE 5480.16 and AL 5480.16 for firearms activities other than those of protective force security.

- FINDINGS:**
- The wording of the Scope statement in AL 5480.16 is not clear about application to the use of firearms other than for security operations, and is not consistent with the scope of DOE 5480.16.
 - Although the scope of DOE 5480.16 applies to all uses of firearms, some portions imply application only to security operations. The DOE Firearms Safety Committee reached a consensus in August 1990 that DOE 5480.16 applies to all uses of small arms firearms.
 - The following Concern was not addressed in the AL Self-Assessment.

CONCERN:
(FS.1-2)
(H2/C1) The scope of AL 5480.16 has been written by the Albuquerque Operations Office in such a way that it has been interpreted by Sandia National Laboratories, Albuquerque, to apply only to security operations.

FS.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Procedures and documentation should be formalized, provide appropriate direction, records, and support for the firearms safety program.

- FINDINGS:**
- The weapons storage facility in Bldg. 6584 as well as the area where firearms are issued/returned are separated from the transportainer used for loading/clearing of weapons contrary to SNL, Albuquerque, Special Order No. 1, January 1991, paragraph II.
 - All lieutenants and captains have access to the repository, where their weapons are stored with magazines inserted. When lieutenants and captains report for duty, they retrieve their hand guns without supervision and carry or drive with them holstered to another building (Bldg. 6584) for a loading procedure to be witnessed by a supervisor. This procedure is not in conformance with SNL, Albuquerque, Special Order No. 1, and implies that there is no supervision until they reach the loading area.
 - While taking a sniper rifle out of a case in Igloo 6622, in response to a S&H Subteam member's request to open the case, a security inspector inadvertently pointed the rifle at a number of people. This is contrary to site specific and basic firearms safety rules.
 - The following Concern was not addressed in the PT TSA.

CONCERN: Practices of some high-risk activities such as loading/clearing (FS.2-1) and handling of firearms do not reflect procedures stated in (H1/C1) Sandia National Laboratories, Albuquerque, Special Order No. 1 and requirements in DOE 5480.16.

- FINDINGS:**
- Experimental activities at the Terminal Ballistics Facility change with the projects assigned to the Dynamic Loads and Facilities Development Division. Standard Operating Procedures are not available for some of the operations.
 - The operations at the Terminal Ballistic Facility are conducted without a firearms safety policy.
 - See Concern FS.1-1.
 - The following Concern was not addressed in the PT TSA.

CONCERN:
(FS.2-2)
(H2/C2)

There is no Sandia National Laboratories, Albuquerque, documentation to ensure that appropriate procedures, policies, and reporting are developed at the Terminal Ballistic Facility or for other Sandia National Laboratories, Albuquerque, operations using firearms.

FS.3 FIREARMS SAFETY APPRAISAL PROGRAM

PERFORMANCE OBJECTIVE: Annual appraisals should cover procedures, responsibilities, and duty assignments within the firearms safety program to ensure that overall objectives and performance criteria are being met.

- FINDINGS:**
- Although other vehicles used by the Operational Security Services Department are provided with securing mechanisms, Viking armored patrol vehicles are not equipped with a mechanism to secure shoulder weapons when not held by an individual, as required by DOE 5480.16, par. II-12.c.
 - Weapons loading and unloading stations at Bldg. 956 (North Force) and Bldg. 6584 (South Force) have metal frames, presenting an impact surface for rounds of ammunition that may be dropped.
 - This Concern was not identified in the PTTSA, or AL Self-Assessment.

CONCERN:
(FS.3-1)
(H2/C2)

Although annual appraisals of Sandia National Laboratories Operational Security Services Department operations have been conducted by Sandia National Laboratories, Albuquerque, and the Albuquerque Operations Office, some hazardous conditions and practices have not been identified and corrected. (See Concern QV.1-3.)

- FINDINGS:**
- Annual formal firearms safety appraisals have not been conducted of the operations at SNL, Albuquerque, Terminal Ballistic Facility, as required by DOE 5480.16 (par. III.1.a and III.1.b) and AL 5480.16 (par. 4.a.(1) and 4.f.(2)).
 - The following Concern was not addressed in the PTTSA.

CONCERN:
(FS.3-2)
(H2/C2)

There is no program to ensure that Sandia National Laboratories, Albuquerque, management are informed through annual appraisals of the status of firearms operations of organizations other than security.

- FINDINGS:**
- The following Concern was not addressed in the AL Self-Assessment.

CONCERN:
(FS.3-3)
(H2/C1)

There is no program to ensure that Albuquerque Operations Office management is informed through annual appraisals, as required by DOE 5480.16 and AL 5480.16, of the status of firearms operations of organizations other than security operations. (See Concerns FS.1-2 and QV.1-4.)

FS.4 FIREARMS SAFETY TRAINING

PERFORMANCE OBJECTIVE: Firearms safety training programs have been established and implemented to ensure compliance with DOE-prescribed standards.

- FINDINGS:**
- No firearms-related training is required for personnel using firearms in the Terminal Ballistics Facility.
 - Requirements for demonstration of technical or practical knowledge of firearms are not specified or conducted at the Terminal Ballistic Facility.
 - See Concern TC.4-2.
 - The following Concern was not addressed in the PTTSA.

CONCERN: A firearms safety training program for Sandia National
(FS.4-1) Laboratories, Albuquerque, personnel working with firearms other
(H2/C2) than protective force personnel has not been established.

FS.5 RANGE OPERATIONS AND PROCEDURES

PERFORMANCE OBJECTIVE: Firearms range operations and procedures are in compliance with DOE requirements.

- FINDINGS:**
- During a qualification course, a shooter was observed putting his thumb in his mouth possibly ingesting lead.
 - While eye protection was utilized by all participants shooting at the firing range, several eyeglass frames were not stamped to indicate conformance to ANSI Z87.1 or 29 CFR 1910.133.
 - Security Inspectors utilizing Safety-Kleen for gun cleaning purposes are not wearing protective gloves as recommended by the material safety data sheet.
 - See Concerns IH.6-2 and WS.3-1.
 - The following Concern was not addressed in the PTTSA.

CONCERN:
(FS.5-1)
(H2/C1)

Safety and health practices at the firing range do not assure the safety and health of employees, as required by 29 CFR 1910.

- FINDINGS:**
- Numerous rocks are present in the impact area on both of the DOE CTA firing ranges used by SNL, Albuquerque (Pistol Range 1 and Rifle Range 1), creating a potential ricochet hazard.
 - At the live fire range weapon cleaning room, the base of the eyewash station was corroded. No record indicates inspection dates of the eyewash station.
 - Although the facilities of the CTA Live Fire Range are used and are not under the direct control of SNL, Albuquerque, responsibility for the health and safety of SNL, Albuquerque, employees using these facilities resides with SNL, Albuquerque, management.
 - See Concern WS.4-4.
 - The PTTSA did not address the following Concern.

CONCERN:
(FS.5-2)
(H2/C2)

There is no Sandia National Laboratories, Albuquerque, procedure or other mechanism to address hazards presented by the facilities at the Department of Energy Central Training Academy.

FINDINGS:

- An SAR has not been prepared for the facilities and operations of the Terminal Ballistics Facility small arms ranges, as required by DOE 5480.16.
- Surface Danger Zones have not been defined for the outdoor small arms range at the Terminal Ballistic Facility, as required by Army Regulations, AR 385-63, (included in DOE 5480.4 as a mandatory policy reference).
- The firing range impact area at the Terminal Ballistic Facility outdoor small arms range is not fenced or posted, as required in AR 385-63.
- The SOP for the Terminal Ballistics Facility indicates that at times the "hazard area" or impact area may extend beyond the fenced area. It may even extend beyond property under the control of SNL, Albuquerque. Road blocks and safety observers are the only control measures specified.
- Procedures for use of the Terminal Ballistics Facility outdoor small arms range require the down range area be cleared before firing. However, incidents have occurred in which security personnel have violated the barriers after the area was "cleared." Communication with SNL, Albuquerque, Safeguards and Security is not specified in procedures.
- The following Concern was not addressed in the PT TSA.

**CONCERN:
(FS.5-3)
(H1/C2)**

There is no program to assure that the hazards at the Sandia National Laboratories, Albuquerque, Terminal Ballistics Facility small arms ranges have been recognized, controlled and remediated.

FINDINGS:

- Site-specific formal range safety rules and regulations are not posted at the Terminal Ballistic Facility small arms ranges, as required by DOE 5480.16.
- Annual emergency response drills to simulate a serious injury on the firing range have not been conducted at the Terminal Ballistics Facility.
- Sand is used in the impact area of the Terminal Ballistics Facility indoor range. It was reported to be changed every three years. Documentation of airborne and surface contamination lead monitoring results were not complete enough to verify the validity of this schedule.
- DOE 5480.16 requires firearms instructors to receive blood lead monitoring semiannually. Although the personnel working in Bldg. 6750 are not "firearms instructors," they may be exposed to equivalent levels of lead. A memorandum of December 1989 states that these SNL, Albuquerque, employees have been monitored for lead with urinary lead testing. If the results of lead monitoring, to quantify the exposure of

individuals who work in the area, were above the action level, urinary lead testing would not be in accordance with 29 CFR Part 1910.1025.

- See Concerns WS.3-1 and IH.4-1.
- The following Concern was not addressed in the PT TSA.

CONCERN:
(FS.5-4)
(H2/C2)

Requirements of DOE 5480.16, Chapter I, have not been fully implemented at the Sandia National Laboratories, Albuquerque, firing ranges at the Terminal Ballistics Facility. (See Concerns FS.1-1 and FS.5-3.)

FS.6**EXERCISES**

PERFORMANCE AND OBJECTIVE: Exercises should be conducted in an approved safe manner with all identified safety hazards analyzed and mitigated.

- FINDINGS:**
- Paint guns (training aids simulating firearms by using compressed carbon dioxide (CO₂) to shoot paint pellets) were used in a training exercise by a supervisor without notifying the Training Officer for approval. The exercise was not included in the standard exercise records. The safety representatives were not notified of the exercise and the SOP covering the use of paint guns had expired. The last authorized special exercise using paint guns occurred approximately 1-1/2 years ago when a lieutenant checked out the paint guns. There has been no documented control since that time.
 - In the M0228 Conference Room, five paint guns were found on a desk located inside the briefing room inside an unlocked rifle case. SNL, Albuquerque, personnel did not know exactly how long the paint guns had been inside the room, or why they have been separated from the rest of the paint guns which were kept in the supply room. Only supervisors can check out paint guns; however, no procedure or inventory ensures accountability for the paint guns after they are checked out from storage.
 - The following Concern was not addressed in the PTTSA.

CONCERN:
(FS.6-1)
(H3/C2)

Sandia National Laboratories, Albuquerque, Operational Security Services Department management does not ensure effective control over training exercises and associated devices (i.e., paint guns).

FS.7**TRANSPORTATION, HANDLING, AND STORAGE OF MUNITIONS**

PERFORMANCE OBJECTIVE: The transportation, handling, and storage of munitions should conform to all DOE prescribed safety standards.

- FINDINGS:**
- While inspecting MO228, it was determined that equipment bags containing, among other items, ammunitions, for quick response purposes, are taken home with security inspectors. The presence of ammunition does create a potential hazard. Procedures do not specifically detail the offsite transportation and storage of ammunition.
 - The following Concern was not addressed in the PT TSA.

CONCERN:
(FS.7-1)
(H2/C1)

Sandia National Laboratories, Albuquerque, Operational Security Services Department has not identified or developed procedures, as required by DOE 5480.16, for the transportation, control, and storage of Class 1.4S munitions offsite and at home for security inspectors.

4.5.22 Firearms Safety DOE Protective Forces

4.5.22.1 Overview

In conjunction with the Tiger Team Assessment of SNL, Albuquerque, it was recognized that the AL also had an armed protective force employed and controlled by AL. These operations are under the purview of the DOE 5480.16, "Firearms Safety." Therefore, the AL Protective Force use of firearms was also reviewed for required compliance with DOE 5480.16. All seven Firearms Safety performance objectives were addressed.

The appraisal was conducted through interviews with the Protective Force management, Firearms Instructors, and Security Inspectors. AL documents, "Firearms Safety Program" (not dated) and "General Orders" (April 1991), were reviewed. Training certification and qualification records were reviewed where available. Bldg. 20380 was visited. The AL security personnel use the CTA Live Fire Range for firearms training and semiannual qualification purposes. Recent efforts have been made to develop a AL Firearms Safety Program, and the program has begun to improve. Between January 1988, when DOE 5480.16 was implemented, and some time in 1989, there is no evidence of a Firearms Safety Program. Even though the AL Protective Force Firearms Safety Program is now in place, it is not in full compliance with DOE 5480.16 or AL 5480.16. Qualification records, prior to May 1990, are nonexistent. Policies and procedures have not been formalized, or are insufficient and incomplete. Annual internal firearms safety appraisals have not been conducted. Security and Safety organization and administration do not currently ensure effective implementation and control of the AL Protective Force Firearms Safety Program. Responsibilities as specified in DOE 5480.16 and AL 5480.16 have not been implemented. AL Protective Force personnel do not have clearly defined authorities, responsibilities, or guidance for firearms safety.

Limited ES&H support has been provided for the AL Protective Force. Because the AL Protective Force personnel are Federal employees, ES&H support was being provided by the ES&H Branch which was part of the Management Support Division of AL. When the KAO was created as a separate organization, the ES&H Branch became part of the KAO. The AL Management Support Division, which still includes the Security Branch and the AL Protective Force, now only receives ES&H support by request from the KAO.

AL Protective Force firearms safety was not addressed in the AL Self-Assessment.

4.5.22.2 Findings and Concerns

FS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Security and safety organizations and administration should ensure the effective implementation and control of the firearms safety program.

- FINDINGS:**
- A firearms safety policy is not stated in documents related to the use of firearms including the AL "Firearms Safety Program" and the AL Protective Force "General Orders." DOE 5480.16 is not referenced or mentioned in the "General Orders," which describe responsibilities, authority, and policies.
 - Annual internal appraisals required by DOE 5480.16, par. III.1.a and III.1.b, and conducted by safety personnel or a joint safety/security team have not been conducted.
 - The Albuquerque Operations Office implementing Order, AL 5480.16, states its purpose as to "provide guidance for AL Headquarters'. . .Firearms Safety Program as required by DOE 5480.16."
 - DOE 5480.16 and AL 5480.16 assign responsibilities for implementation and assuring compliance to managers of security and safety.
 - Written AL Protective Force policies state authorities and responsibilities for firearms safety only at the level of "Supervisor" and "Employee."
 - The responsibilities of a Shift Supervisor in the "General Orders" include acting as a Training Officer. However, the responsibilities and authorities of a Training Officer are not specified.
 - Responsibilities for AL safety and health guidance or appraisals is unclear with the organizational changes accompanying the creation of the KAO. It is not clear that sufficient support is provided for the AL Protective Force.
 - These Concerns were not addressed in the AL Self-Assessment.

CONCERN: (AL FS.1-1)
(H2/C1) A Firearms Safety Program has not been fully implemented in accordance with the compliance assurance and appraisal requirements of paragraphs 8.a and 8.b of DOE 5480.16 and paragraph 4.b.(1) of AL 5480.16.

CONCERN: (AL FS.1-2)
(H2/C1) Responsibility for implementing and ensuring compliance with DOE 5480.16 and AL 5480.16 is not clearly defined or reflected in the Albuquerque Operations Office Protective Force Firearms Safety Program.

FS.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Procedures and documentation should be formalized, provide appropriate direction, records, and support for the firearms safety programs.

- FINDINGS:**
- A supervisor was observed loading a revolver while unsupervised. It was indicated that this practice had been identified earlier during a recent internal AL Safeguards and Security Inspection and Evaluation (I&E) audit.
 - The AL Protective Force is able to use the CTA armorers for conducting semiannual inspections and repair of their firearms. Although records are maintained at the CTA, no records could be produced within AL regarding the status of the inspections.
 - While an AL Protective Force Firearms Safety Committee is defined in the "Firearms Safety Program" document, the Committee has not yet met or been effectively implemented, as required by DOE 5480.16, par. III.2.b.(3).
 - The AL Protective Force personnel transport their revolvers to and from the CTA for repair and semiannual inspections. No formal procedure was identified for this activity.
 - Procedures required by DOE 5480.16 to be developed, par. I.1.f.(1), and to be reviewed by Safety and Security personnel annually were available for only a few operations.
 - A firearms qualification examination score of 60 percent (70 percent is a passing score) was obtained by a security inspector. No documentation exists to indicate that a retest was taken or that a passing score was attained. A supervisor reported that the individual passed an oral examination, however, the retest was not recorded.
 - This Concern was not addressed in the AL Self-Assessment.

CONCERN: Procedures and documentation required by DOE 5480.16 have not been effectively formalized or implemented for the Albuquerque Operations Office Protective Force.
(AL FS.2-1)
(H3/C1)

FS.3 FIREARMS SAFETY APPRAISAL PROGRAM

PERFORMANCE OBJECTIVE: Annual appraisals should cover procedures, responsibilities, and duty assignments within the firearms safety program to ensure that overall objectives and performance criteria are being met.

- FINDINGS:**
- In December 1990, it was recognized that a formal firearms safety program was not in place for the AL Protective Force. Assistance in developing a program was believed to be more productive than the appraisal of a program that was not in place; and performance of an appraisal was postponed.
 - Although DOE 5480.16 and AL 5480.16 clearly require annual formal appraisals, not one firearms safety appraisal has been conducted of the AL Protective Force operations to date.
 - This Concern was not addressed in the AL Self-Assessment.

CONCERN: Annual appraisals, required by DOE 5480.16, and AL 5480.16, have not been conducted of the Albuquerque Operations Office Protective Force.
(AL FS.3-1)
(H3/C1)

FS.4 FIREARMS SAFETY TRAINING

PERFORMANCE OBJECTIVE: Firearms safety training programs have been established and implemented to ensure compliance with DOE-prescribed standards.

- FINDINGS:**
- Documentation of firearms training before 1989 was not available for review, as required by DOE 5480.16, par. I.1.C.
 - Required risk analyses for new training/evaluation methods were not available.
 - Lesson plans are not reviewed annually and are not completely developed incorporating safety and other objectives, as required by DOE 5480.16, par. I.1.e.
 - See Concern AL FS.2-1.
 - This Concern was not addressed in the AL Self-Assessment.

CONCERN: The Albuquerque Operations Office Protective Force Firearms Safety Training Program has not been fully developed, and is not in compliance with DOE 5480.16 and AL 5480.16.
(AL FS.4-1)
(H2/C1)

FS.5 RANGE OPERATIONS AND PROCEDURES

PERFORMANCE OBJECTIVE: Firearms range operations and procedures are in compliance with DOE requirements.

- FINDINGS:**
- The AL Protective Force uses the CTA firing range for firearms training and qualifications. The requirement for airborne lead monitoring has been considered to be met by receiving a print-out of the CTA airborne lead monitoring results. The summary print-out does not indicate that the sampling has been done regularly, includes no description of testing protocol, and does not give information on acceptable levels.
 - There is no indication of Industrial Hygiene support for the lead monitoring (airborne and blood lead level) or hearing conservation program.
 - There is no clear assignment of health and safety support or guidance for the AL Protective Force to ensure the health and safety of employees is protected during range operations.
 - This Concern was not addressed in the AL Self-Assessment.

CONCERN: No clearly defined ES&H responsibilities are in place to ensure
(AL FS.5-1) the health and safety of Albuquerque Operations Office Protective
(H2/C2) Force employees for range operations.

FS.6 EXERCISES

PERFORMANCE OBJECTIVE: Exercises should be conducted in an approved safe manner with all identified safety hazards analyzed and mitigated.

- FINDINGS:**
- There is a lack of documentation and control of training exercises. Only a few recent training exercises are documented with appropriate approval.
 - This Concern was not addressed in the AL Self-Assessment.

CONCERN: No system is in place to assure that exercises are conducted in
(AL FS.6-1) accordance with DOE 5480.16.
(H2/C2)

FS.7 TRANSPORTATION, HANDLING, AND STORAGE OF MUNITIONS

PERFORMANCE OBJECTIVE: The transportation, handling and storage of munitions should confirm to all DOE-prescribed safety standards.

- FINDINGS:**
- Documentation of procedures and control of transportation, handling and storage of munitions, as required by DOE 5480.16, paragraph 4.b, Chapter II, paragraph 2.i, and Chapter IV, paragraphs 2, 3 and 4, is incomplete.
 - This Concern was not addressed in the AL Self-Assessment.

CONCERN: Documentation of procedures for transportation, handling, and
(AL FS.7-1) storage of munitions, as required by DOE 5480.16, is incomplete.
(H3/C1)

4.6 NOTEWORTHY PRACTICES

Noteworthy Practices are exceptional ways of accomplishing a Performance Objective or some aspect of it. Other DOE facilities are encouraged to adopt these practices when they are applicable to their operation.

OA.1 SITE/FACILITY ORGANIZATION

PERFORMANCE OBJECTIVE: Management should organize and manage the site/facility's work, programs, and resources so that safety and health are an integral part of the personnel duties and requirements and are consistently implemented.

NOTEWORTHY PRACTICE: The SNL, Albuquerque, management has developed a flowchart that lists all ES&H requirements that have been imposed upon SNL, Albuquerque, and how these requirements feed into ES&H policy, programs, manuals, and finally into operating procedures. The flow diagram on the following page lists the applicable regulations from the Department of Energy, Environmental Protection Agency, Department of Defense, Department of Transportation, Department of Interior, DOE-Implemented Federal Laws, and State and local legislation and agencies. The flow diagram is updated as new regulations are imposed upon the Laboratory. The noteworthiness of the flow diagram is that it is posted in conspicuous places around the Laboratory, and provides, at one glance, the entire list of ES&H regulations with which the Laboratory is striving for compliance and achievement of a high level of excellence. In this way, it brings the entire staff into a buy-in of the ES&H program.

IH.3 MANAGEMENT OF HEALTH CONCERNS

PERFORMANCE OBJECTIVE: Chemical, biological, physical, and/or other environmental stresses arising in the workplace should be identified, evaluated, and controlled.

NOTEWORTHY PRACTICE: During the introduction and tour of the Glass Formulation and Fabrication Section, an emergency shower water flow alarm was noted. The alarm mechanism was developed by personnel in the facility to be permanently plumbed into either an eyewash or emergency shower.

This mechanism is battery powered and functionally checked automatically whenever the shower or eyewash is flow checked. Although not designed into this unit, there is the potential for this monitor to be equipped to operate in remote locations and alarm to a controlled alternate area.

This mechanism is mechanically simple, providing reliable and audible notification whenever an emergency shower/eyewash is being used, and indirectly summons help.

Installation on all emergency eyewashes or showers in a facility is not necessarily practicable and should be reserved for those areas of high hazard where assistance to the user is advised or the consequences of not receiving aid is significant.

No codes or standards require such a device; however, the incorporation of this equipment could be characterized as a good practice.

Sandia National Laboratories

ENVIRONMENT, SAFETY AND HEALTH REQUIREMENTS

4.7 SYSTEM FOR CATEGORIZING CONCERNS

Each concern contained in this report has been characterized using the following three sets of criteria.

- A. **CATEGORY I:** Addresses a situation for which a "clear and present" danger exists to workers or members of the public. A concern in this category is to be immediately conveyed to the managers of the facility for action. If a clear and present danger exists, the Assistant Secretary for Environment, Safety and Health, or his/her designee, is to be informed immediately so that consideration may be given to exercising the Secretary's facility shutdown authority or directing other immediate mitigation measures.

CATEGORY II: Addresses a significant risk or substantial noncompliance with DOE Orders, but does not involve a situation for which a clear and present danger exists to workers or members of the public. A concern in this category is to be conveyed to the manager of the facility no later than the appraisal closeout meeting for immediate attention. Category II concerns have a significance and urgency such that the necessary field response should not be delayed until the preparation of a final report or the routine development of an action plan. Again, consideration should be given to whether compensatory measures, mitigation, or facility shutdown are warranted under the circumstances.

CATEGORY III: Addresses significant noncompliance with DOE Orders, or the need for important in the margin of safety, but is not of sufficient urgency to require immediate attention.

- B. **Hazard Level 1:** Has the potential for causing a severe occupational injury, illness, or fatality, or the loss of the facility.
- Hazard Level 2:** Has the potential for causing minor occupational injury or illness or major property damage, or has the potential for resulting in, or contributing to, unnecessary exposure to radiation or toxic substances.
- Hazard Level 3:** Has little potential for threatening safety, health, or property.
- C. **Compliance Level 1:** Does not comply with DOE Orders, prescribed policies or standards, or documented accepted practices. The latter is a professional judgment based on the acceptance and applicability of national consensus standards not prescribed by DOE requirements.
- Compliance Level 2:** Does not comply with DOE references, standards, or guidance, or with good practice (as derived from industry experience, but not based on national consensus standards).

Compliance Level 3: Has little or no compliance considerations. Concerns are based on professional judgment in pursuit of excellence in design or practice, i.e., these are improvements for their own sake and are not deficiency-driven.

4.8 CATEGORIZATION AND TABULATION OF CONCERNS

4.8.1 Categorization of Concerns

<u>Concerns Numbers</u>	<u>Potential Hazard Level</u>	<u>Compliance Level</u>
OA.1-4	2	1
OA.1-5	2	2
OA.1-6	2	2
OA.1-7	2	2
OA.2-1	2	2
OA.2-2	2	1
OA.2-3	2	1
OA.2-4	2	2
OA.3-1	3	1
OA.4-4	2	2
OA.5-1	2	2
OA.5-2	2	1
OA.5-3	2	2
OA.6-2	2	2
OA.7-2	2	1
OA.7-3	2	1
OA.7-4	2	2
OA.7-5	2	2
OA.8-1	2	2
QV.1-1	2	1
QV.1-2	2	1
QV.1-3	3	2
QV.1-4	2	1
QV.2-1	2	1
QV.3-1	2	1
QV.4-1	2	2
QV.5-1	2	1
QV.6-1	2	1
QV.7-1	2	2
OP.1-1	3	1
OP.1-2	3	2
OP.1-3	2	2
OP.1-4	3	1
OP.2-2	3	1
OP.3-8	2	1
OP.3-9	2	1
OP.3-10	3	1

** Designates Category I

* Designates Category II

<u>Concerns Numbers</u>	<u>Potential Hazard Level</u>	<u>Compliance Level</u>
OP.4-1	2	1
OP.4-2	1	1
OP.4-3	2	2
OP.4-4	2	1
OP.5-1	2	1
OP.6-1	3	2
OP.6-2	3	1
OP.7-1	3	1
OP.8-1	2	2
OP.8-2	2	2
MA.1-1	2	1
MA.1-2	2	1
MA.1-3	2	1
MA.1-4	2	1
MA.1-5	2	2
MA.2-1	1	1
MA.2-2	2	1
MA.2-3	1	2
MA.3-2	2	1
MA.3-3	1	1
MA.3-4	2	1
MA.4-1	3	1
MA.4-2	1	1
MA.4-3	2	1
MA.5-2	2	1
MA.5-3	2	1
MA.6-1	2	1
MA.6-2	1	1
MA.6-3	2	1
MA.7-2	2	1
MA.8-1	3	1
MA.8-2	2	1
TC.1-2	2	2
TC.4-2	2	2
TC.4-3	2	2
TC.9-1	2	1
AX.1-1	2	1
AX.2-1	2	1
AX.3-1	2	1
AX.3-2	2	2
AX.4-2	2	1
AX.5-1	2	2
AX.8-1	2	2

**** Designates Category I**
*** Designates Category II**

<u>Concerns Numbers</u>	<u>Potential Hazard Level</u>	<u>Compliance Level</u>
EP.2-1	2	1
EP.2-2	1	1
EP.2-3	2	1
EP.2-4	3	2
EP.2-5	3	1
EP.4-1	2	2
EP.5-1	2	2
EP.6-1	3	2
EP.7-1	2	2
TS.1-2	2	1
TS.2-1	2	2
TS.3-2	2	2
PT.1-1	2	1
PT.1-2	3	1
PT.2-1	2	1
PT.3-1	2	1
PT.5-1	2	1
PT.6-1	2	2
PT.6-2	2	2
PT.8-1	3	2
PT.11-1	3	1
CS.1-1	2	1
CS.1-2	2	2
CS.1-3	2	2
CS.3-1	2	1
CS.3-2	1	2
CS.3-3	2	2
CS.4-1	2	1
CS.5-1	2	2
CS.5-2	2	1
CS.5-3	2	1
SS.1-1	2	2
SS.1-2	2	2
SS.2-1	2	2
SS.2-2	2	2
SS.3-1	2	2
SS.4-1	2	1
EA.1-2	3	1
EA.2-2	2	1

**** Designates Category I**
*** Designates Category II**

<u>Concerns Numbers</u>	<u>Potential Hazard Level</u>	<u>Compliance Level</u>
EA.2-3	2	1
EA.3-1	2	1
EA.4-1	2	1
FR.1-1	2	1
FR.1-2	2	1
FR.3-1	2	2
FR.5-2	2	1
RP.1-3	2	2
RP.1-4	2	2
RP.2-3	2	1
RP.2-4	2	2
RP.3-2	2	2
RP.3-3	2	1
RP.3-4	2	1
RP.4-1	2	1
RP.4-2	2	2
RP.5-2	2	1
RP.5-3	2	1
RP.7-2	3	1
RP.8-3	2	2
RP.8-4	2	2
RP.9-1	2	1
RP.10-2*	2	1
RP.10-3*	2	1
RP.10-4	2	1
RP.10-5	2	2
RP.11-1	2	2
RP.11-2	2	2
RP.11-3	2	1
RP.12-1	3	1
RP.12-2	3	1
WS.3-1	1	1
WS.3-2	1	1
WS.3-3	1	1
WS.4-1	1	1
WS.4-2	2	1
WS.4-3	2	1
WS.4-4	2	1
WS.4-5*	1	1
WS.4-6**	1	1
WS.4-7*	1	1
WS.4-8	1	1

** Designates Category I
* Designates Category II

<u>Concerns Numbers</u>	<u>Potential Hazard Level</u>	<u>Compliance Level</u>
WS.4-9*	1	1
WS.4-10	2	1
WS.4-11	2	1
WS.4-12	2	1
WS.5-1	1	1
WS.5-2	1	1
WS.5-3*	1	1
WS.5-4*	1	1
WS.5-5	1	1
IH.1-1	3	2
IH.1-2	2	2
IH.2-1	2	1
IH.3-1	2	1
IH.4-1	2	1
IH.5-1	1	1
IH.5-2	1	1
IH.5-3	2	1
IH.5-4	2	2
IH.5-5	1	1
IH.6-1	2	1
IH.6-2	3	1
IH.6-3	2	1
OS.1-1	2	1
OS.1-2	1	1
OS.1-3	1	2
OS.1-4	2	1
OS.2-1	2	1
OS.2-2	2	1
OS.2-3	2	1
OS.2-4	2	1
OS.2-5	2	1
OS.4-1	1	1
OS.4-2	1	1
OS.5-1	2	1
FP.1-1	2	1
FP.1-2	2	1
FP.2-1	2	1
FP.4-1	2	1
FP.4-2	2	1
FP.5-1	2	1
FP.6-1	2	1
FP.7-1	2	1

**** Designates Category I**
*** Designates Category II**

<u>Concerns Numbers</u>	<u>Potential Hazard Level</u>	<u>Compliance Level</u>
FP.7-2	2	1
FP.7-3	2	1
MS.1-1	2	1
MS.1-2	2	1
MS.2-1	2	1
MS.3-1	2	1
MS.3-2	2	1
MS.3-3	2	3
MS.4-1	2	1
MS.5-1	2	1
ES.1-1	2	2
ES.1-2	2	2
ES.1-3	2	2
ES.2-1	2	2
ES.4-1	2	1
ES.5-1	2	2
ES.7-1	1	1
ES.7-2	1	1
FS.1-1	2	2
FS.1-2	2	1
FS.2-1	1	1
FS.2-2	2	2
FS.3-1	2	2
FS.3-2	2	2
FS.3-3	2	1
FS.4-1	2	2
FS.5-1	2	1
FS.5-2	2	2
FS.5-3	1	2
FS.5-4	2	2
FS.6-1	3	2
FS.7-1	2	1
AL FS.1-1	2	1
AL FS.1-2	2	1
AL FS.2-1	3	1
AL FS.3-1	3	1
AL FS.4-1	2	1
AL FS.5-1	2	2
AL FS.6-1	2	2
AL FS.7-1	3	1

**** Designates Category I**
*** Designates Category II**

4.8.2

Tabulation of Concerns

4.5.1 Organization and Administration

- CONCERN:** Individual formal job descriptions, including assignments of safety responsibilities and commensurate delegation of authority to accomplish the safety responsibilities, do not exist, as required by DOE 5480.19, for many management and staff personnel.
(OA.1-4)
(H2/C1)
- CONCERN:** Regularly scheduled safety meetings do not always occur, and the scheduled frequency and purpose do not always meet industry standards.
(OA.1-5)
(H2/C2)
- CONCERN:** Stop-work authority of the Albuquerque Operations Office personnel is not well defined.
(OA.1-6)
(H2/C2)
- CONCERN:** Stop-work authority of the Kirtland Area Office personnel is not well defined.
(OA.1-7)
(H2/C2)
- CONCERN:** The assignment of responsibility for assuring the safety within designated space at the Laboratory is not well understood, and does not always have the accompanying delegation of authority to accomplish the assigned responsibilities.
(OA.2-1)
(H2/C2)
- CONCERN:** Sandia National Laboratories, Albuquerque, does not currently have a fully institutionalized self-assessment program, nor all elements of an independent safety appraisal program, as required by DOE 5480.5, DOE 5480.6, DOE 5480.19, and DOE 5482.1B.
(OA.2-2)
(H2/C1)
- CONCERN:** Procedures for some safety-related activities, including Operational Readiness Reviews, restarts, and revisions to Safety Analysis Reports are not in place in the Albuquerque Operations Office, as required by SEN-16A-90.
(OA.2-3)
(H2/C1)
- CONCERN:** The Kirtland Area Office safety goals and objectives are not specifically quantified or documented with regard to their oversight of Sandia National Laboratories, Albuquerque.
(OA.2-4)
(H2/C2)
- CONCERN:** Definitive goals are not set and promulgated as a means of promoting a unified effort to achieving excellence in safety issues, as required by DOE 5480.19.
(OA.3-1)
(H3/C1)
- CONCERN:** The Sandia Corporation Board of Directors has not requested that the American Telephone and Telegraph Company provide routine oversight of the environment, safety, and health parts of the contract.
(OA.4-4)
(H2/C2)
- CONCERN:** A program to plot, trend, and evaluate performance indicators has not yet been implemented.
(OA.5-1)
(H2/C2)

CONCERN: There is no requirement for frequent management walkthroughs in the workplace or definition of the purpose to be accomplished by these walkthroughs or other presence in the workplace, as required by DOE 5480.19.
(OA.5-2)
(H2/C1)

CONCERN: There is no institutionalized self-appraisal program for the Albuquerque Operations Office.
(OA.5-3)
(H2/C2)

CONCERN: Performance evaluations have not always included safety as an evaluation element.
(OA.6-2)
(H2/C2)

CONCERN: There is no uniform requirement for periodic review and update of controlled documents, and no independent audit system to assure that individual copies of controlled documents are maintained current, as required by DOE 5480.19.
(OA.7-2)
(H2/C1)

CONCERN: Important records are not always stored in accordance with the requirements of DOE 1324.5, NFPA 232, and ASME NQA-1-1989.
(OA.7-3)
(H2/C1)

CONCERN: The Albuquerque Operations Office document control system does not ensure a reliable auditable system for managing all incoming and outgoing documents.
(OA.7-4)
(H2/C2)

CONCERN: There is no plan in the Albuquerque Operations Office to ensure that Sandia National Laboratories, Albuquerque, facilities will receive adequate risk assessment and documentation.
(OA.7-5)
(H2/C2)

CONCERN: Not all who are in a position to cause serious harm or damage to people, property, or the environment are trained and periodically tested for substance abuse.
(OA.8-1)
(H2/C2)

4.5.2 Quality Verification

CONCERN: Sandia National Laboratories, Albuquerque, quality programs fully implementing requirements of DOE 5700.6B, Sections 8 and 9, are not yet established.
(QV.1-1)
(H2/C1)

CONCERN: Sandia National Laboratories, Albuquerque, has not defined formal quality assurance training requirements, as required by DOE 5700.6B and DOE 5480.20.
(QV.1-2)
(H2/C1)

CONCERN: The Sandia National Laboratories, Albuquerque, audits program does not meet the ASME NQA-1-1989 requirement for periodic management evaluation of the effectiveness of the Quality Assurance Program.
(QV.1-3)
(H3/C2)

CONCERN: The Albuquerque Operations Office is not providing sufficient independent oversight to verify quality effectiveness at Sandia National Laboratories, Albuquerque, as required by DOE 5700.6B.
(QV.1-4)
(H2/C1)

CONCERN: Sandia National Laboratories, Albuquerque, documentation of
(QV.2-1) procurement activities does not provide for independent
(H2/C1) verification, as required by DOE 5700.6B.

CONCERN: Sandia National Laboratories, Albuquerque, has not provided
(QV.3-1) guidance and formal documentation of procedures and requirements
(H2/C1) for receiving and preinstallation inspections, in accordance with
the requirements of DOE 5700.6B.

CONCERN: Calibration programs are neither consistently implemented nor
(QV.4-1) effectively verified for all Sandia National Laboratories,
(H2/C2) Albuquerque, projects, programs, and facilities.

CONCERN: Sandia National Laboratories, Albuquerque, policies and programs
(QV.5-1) do not address the identification, control, use, and/or
(H2/C1) disposition of hardware, materials, parts, and components, as
required by DOE 5700.6B.

CONCERN: Sandia National Laboratories, Albuquerque, has not established a
(QV.6-1) program to ensure inspections meet the requirements of
(H2/C1) DOE 5700.6B.

CONCERN: Requirements for the control of special processes and the means
(QV.7-1) for verifying their implementation are not established at Sandia
(H2/C2) National Laboratories, Albuquerque, as required by ASME
NQA-1-1989.

4.5.3 Operations

CONCERN: Measurable goals and performance indicators are not used at
(OP.1-1) facilities to effectively improve performance and safe
(H3/C1) operations, as required by DOE 5480.19. (See Concerns OA.3-1 and
OA.5-1.)

CONCERN: Sandia National Laboratories, Albuquerque, has not implemented a
(OP.1-2) policy and set of requirements that provide a clear delineation
(H3/C2) of the lines of authority and responsibilities for the facility
operating organizations. (See Concern TS.1-2.)

CONCERN: The responsibilities and authorities of each facility operations
(OP.1-3) position are neither defined nor documented for most facilities,
(H2/C1) as required by DOE 5480.19. (See Concerns OA.1-4 and MA.1-2.)

CONCERN: Sandia National Laboratories, Albuquerque, does not have a policy
(OP.1-4) that defines the requirements for an effective, required reading
(H3/C1) program, as defined in DOE 5480.19.

CONCERN: Sandia National Laboratories, Albuquerque, has neither a policy
(OP.2-2) nor procedures establishing the requirements for facility
(H3/C1) operations logs, as required by DOE 5480.19.

- CONCERN:**
(OP.3-8)
(H2/C1) Sandia National Laboratories, Albuquerque, has not established an effective configuration control system addressing procedures, drawings, manuals, and the physical plant to ensure safe facility operation, as required by DOE 5480.19. (See Concerns TS.2-1 and OA.7-2.)
- CONCERN:**
(OP.3-9)
(H2/C1) Sandia National Laboratories, Albuquerque, has not implemented a formal methodology for development, approval, and control of operating procedures at most facilities, as required by DOE 5480.19. (See Concerns MA.8-1 and TS.2-1.)
- CONCERN:**
(OP.3-10)
(H3/C1) Sandia National Laboratories, Albuquerque, does not have a policy that defines the use and control of operator aides, as required by DOE 5480.19.
- CONCERN:**
(OP.4-1)
(H2/C1) Sandia National Laboratories, Albuquerque, does not have a program which effectively controls the identification, tagging, and logging of equipment which has been removed from service, as required by DOE 5480.19.
- CONCERN:**
(OP.4-2)
(H1/C1) Sandia National Laboratories, Albuquerque, has not implemented a lockout/tagout program consistent with the requirements of DOE 5480.19, DOE 5483.1A, and in the Code of Federal Regulations 29 CFR 1910.147. (See Sections MA.2 and OS.2.)
- CONCERN:**
(OP.4-3)
(H2/C2) Sandia National Laboratories, Albuquerque, has not established a system to assure that appropriate changes are made to affected operating documents prior to the required implementation date of new or revised policies, practices and Department of Energy Orders.
- CONCERN:**
(OP.4-4)
(H2/C1) Sandia National Laboratories, Albuquerque, has not established a policy and set of implementing procedures that ensure the staff of an operating facility is trained in new procedures, manuals, and requirements prior to their implementation, as required by DOE 5480.19.
- CONCERN:**
(OP.5-1)
(H2/C1) The housekeeping in some areas detracts from facility safety, and is not in accordance with DOE 5483.1A, DOE 5480.19, 29 CFR 1910.22, and generally accepted industrial practice. (See Concerns MA.2-3 and WS.4-1.)
- CONCERN:**
(OP.6-1)
(H3/C2) Management has not established standards and directives providing a clear concise definition of acceptable operating modes (operating, shutdown, standby, etc.) for facilities and experiments consistent with generally accepted industrial practices.
- CONCERN:**
(OP.6-2)
(H3/C1) Sandia National Laboratories, Albuquerque, has not established policies and procedures to ensure that job-specific training, retraining, and certification is performed by qualified instructors, and that training and qualification plans are formally documented, as required by DOE 5480.19. (See Concerns TC.1-2 and QV.1-2.)

CONCERN: Sandia National Laboratories, Albuquerque, has not implemented an
(OP.7-1) effective operations shift change policy and set of procedures,
(H3/C1) in accordance with DOE 5480.19.

CONCERN: Sandia National Laboratories, Albuquerque, has not developed and
(OP.8-1) implemented coding conventions (color, size, shape) and labeling
(H2/C2) conventions for facility systems, components, and equipment
consistent with American National Standards Institute (ANSI)
13.1Z and generally accepted industrial practice.

CONCERN: The current shift routine of the steam plant has not been
(OP.8-2) considered in the design of the control panel monitoring the
(H2/C2) Microelectronics Development Laboratory and the Steam Plant.

4.5.4 Maintenance

CONCERN: Sandia National Laboratories, Albuquerque, lacks a consistent
(MA.1-1) formal maintenance program for both real and programmatic
(H2/C1) property, and is not in compliance with DOE 4330.4A in this
regard. In the case of programmatic property, plans and goals
have not been prepared to achieve compliance with DOE 4330.4A.

CONCERN: The Sandia National Laboratories, Albuquerque, maintenance
(MA.1-2) organizational structure and the related responsibilities,
(H2/C1) authorities, and procedural methods are not defined, as required
by DOE 4330.4A.

CONCERN: The Facilities Maintenance and Operations Department and
(MA.1-3) programmatic organizations have not applied a graded approach to
(H2/C1) their maintenance activities, as required by DOE 4330.4A.

CONCERN: Resources have not been allocated to enable the Facilities
(MA.1-4) Maintenance and Operations Department to implement the
(H2/C1) requirements of DOE 4330.4A in a timely manner.

CONCERN: The maintenance work backlog is excessive.
(MA.1-5)
(H2/C2)

CONCERN: Not all maintenance managers and supervisors take an active role
(MA.2-1) in minimizing the exposure of personnel to hazardous conditions,
(H1/C1) as required by DOE 4330.4A.

CONCERN: Maintenance practices do not ensure that maintenance areas are
(MA.2-2) kept in an orderly, clean, and safe condition, as required by
(H2/C1) 29 CFR 1910.141.

CONCERN: There is a lack of emphasis on training and qualification of
(MA.2-3) electrical craftspersons and mechanical supervisors supervising
(H1/C2) electrical crafts.

CONCERN: The maintenance warehouse system does not ensure control, protection, or segregation of materials and spare parts, in accordance with 29 CFR 1910.176.
(MA.3-2)
(H2/C1)

CONCERN: The requirements of 29 CFR 1910.184, are not being met at Sandia National Laboratories, Albuquerque, in that uncertified lifting, hoisting, and rigging equipment are employed.
(MA.3-3)
(H1/C1)

CONCERN: There is no system that ensures all instruments requiring calibration have been identified and their calibration maintained, as required by DOE 4330.4A.
(MA.3-4)
(H2/C1)

CONCERN: The Sandia National Laboratories, Albuquerque, planning, scheduling, and work control system for facility maintenance does not always ensure that maintenance activities are conducted in a timely and efficient manner, as required by DOE 4330.4A.
(MA.4-1)
(H3/C1)

CONCERN: Some safety-related maintenance tasks are not entered into the work control system and are not always addressed in a timely manner, as required by DOE 4330.4A.
(MA.4-2)
(H1/C1)

CONCERN: The maintenance of programmatic equipment at the smaller experimental facilities is not planned, scheduled, or controlled, as required by DOE 4330.4A.
(MA.4-3)
(H2/C1)

CONCERN: The Sandia National Laboratories, Albuquerque, has not implemented a Corrective Maintenance Program for real property which ensures that equipment is maintained to uniform high standards, as required by DOE 4330.4A.
(MA.5-2)
(H2/C1)

CONCERN: The Sandia National Laboratories, Albuquerque, has not implemented a Corrective Maintenance Program for programmatic equipment which ensures that equipment is maintained to uniform high standards, as required by DOE 4330.4A.
(MA.5-3)
(H2/C1)

CONCERN: The Preventive Maintenance Program for real property is not complete or fully implemented, as required by DOE 4330.4A.
(MA.6-1)
(H2/C1)

CONCERN: Sandia National Laboratories, Albuquerque, does not have a Preventive Maintenance Program for cranes and hoists which identifies and corrects deficiencies in a timely manner, as required by the Department of Energy Hoisting and Rigging Manual, 29 CFR 1910.179 and OSHA 5A1.
(MA.6-2)
(H1/C1)

CONCERN: The Sandia National Laboratories, Albuquerque, do not have a Preventive Maintenance Program for programmatic equipment that ensures complete, detailed and documented maintenance is performed, as required by DOE 4330.4A.
(MA.6-3)
(H2/C1)

CONCERN: The Sandia National Laboratories, Albuquerque, do not have a formal Predictive Maintenance Program for real property and programmatic equipment, as required by DOE 4330.4A.
(MA.7-2)
(H2/C1)

CONCERN: Maintenance records are not controlled, protected, or disposed
(MA.8-1) of, in accordance with DOE 1324.2.
(H3/C1)

CONCERN: Maintenance procedures do not provide accurate and complete
(MA.8-2) detailed information to enable users to understand and perform
(H2/C1) their activities safely and efficiently, as required by
DOE 4330.4A.

4.5.5 Training and Certification

CONCERN: Training commitment and procedures at Sandia National
(TC.1-2) Laboratories, Albuquerque, have not been properly articulated.
(H2/C2)

CONCERN: The elements and bases for formal training and retraining
(TC.4-2) programs do not exist.
(H2/C2)

CONCERN: Examinations were not always conducted to evaluate the trainees'
(TC.4-3) understanding of the course subject material.
(H2/C2)

CONCERN: A training program for radiological protection technicians, as
(TC.9-1) required by DOE 5480.11, Section 9.0.(3), has not been
(H2/C1) implemented.

4.5.6 Auxiliary Systems

CONCERN: The specification and formal documentation of the functional
(AX.1-1) requirements for auxiliary systems at Sandia National
(H2/C1) Laboratories, Albuquerque, are inconsistent across the site, and
in some cases do not comply with the requirements of DOE 5480.1B,
Section 7; DOE 5481.1B, Chapter 1; DOE 5480.5, Section 8; and DOE
5480.6, Section 8.

CONCERN: Monitoring and disposal of hazardous and radioactive effluents at
(AX.2-1) Sandia National Laboratories, Albuquerque, is not consistent with
(H2/C1) the requirements of DOE 5480.4, Attachment 1, Section 2b; DOE
5484.1, Chapter IV; DOE 5480.11, Sections 5 and 8.

CONCERN: The storage of solid radioactive and mixed waste at the
(AX.3-1) generator's facilities is not consistent with the requirements of
(H2/C1) DOE 5480.4, Attachment 1, Section 2b, and DOE 5480.11, Sections 5
and 8, and presents potential for unnecessary personnel exposure.

CONCERN: Headquarters, Department of Energy, has not provided the defense
(AX.3-2) waste generator certification necessary to meet the requirements
(H2/C2) of NVO-325 (revision 1), "Draft, Nevada Test Site Defense Waste
Acceptance Criteria, Certification and Transfer Requirements,"
September 1990.

- CONCERN:** Storage of fissile material in Technical Area V is not considered
(AX.4-2) in the Safety Analysis Report, as required by DOE 5480.5, Section
(H2/C1) 8A and DOE 5481.1B, Chapter 1, Section 4. (See Concern CS.3-1.)
- CONCERN:** Ventilation air flow from clean to less clean areas to control
(AX.5-1) contamination cannot be ensured due to the potential for blockage
(H2/C2) in the filters. (See Concerns QV. 6-1 and QV. 4-1.)
- CONCERN:** There is no program to ensure that tests and checks on engineered
(AX.8-1) safety systems are performed to ensure system reliability and
(H2/C2) safety. (See Concern QV.6-1.)

4.5.7 Emergency Preparedness

- CONCERN:** Sandia National Laboratories does not have an approved Emergency
(EP.2-1) Plan and Emergency Plan Implementing Procedures, as required by
(H2/C1) DOE 5500.1A and DOE 5500.3A. (See Concern FP.6-1.)
- CONCERN:** Detailed information regarding hazardous materials in vital
(EP.2-2) buildings is not readily available to the Fire Department, as
(H1/C1) required by NFPA 1500. (See Concern CS.5-1.)
- CONCERN:** Emergency Planning Zones for fixed offsite hazards have not been
(EP.2-3) established, as required by NFPA 1500.
(H2/C1)
- CONCERN:** Experiment test planning is not coordinated with appropriate
(EP.2-4) emergency planning and/or emergency response organizations. (See
(H3/C2) Concern EA.2-1.)
- CONCERN:** The Albuquerque Operations Office does not have an approved
(EP.2-5) Emergency Plan, as required by DOE 5500.1A.
(H3/C1)
- CONCERN:** Lessons learned from drills, exercises, and actual events are not
(EP.4-1) being investigated for root causes and solutions, especially in
(H2/C2) the area of communications.
- CONCERN:** The timely availability of craft support during off-hours is not
(EP.5-1) assured.
(H2/C2)
- CONCERN:** A methodology for rapidly assessing potential consequences of
(EP.6-1) hazardous chemical releases to the atmosphere is not readily
(H3/C2) available for emergency response.
- CONCERN:** Field mobility of atmospheric radiological monitoring teams
(EP.7-1) during an emergency is restricted due to the lack of a suitably
(H2/C2) equipped rough terrain emergency vehicle.

4.5.8 Technical Support

CONCERN: Individual responsibilities and authorities are not clearly delineated throughout Sandia National Laboratories, Albuquerque, technical support organizations, as required by DOE 5480.19. (TS.1-2) (H2/C1)
(See Concerns OA.1-4 and OP.1-2.)

CONCERN: There is no reliable Sandia National Laboratories, Albuquerque, system for developing and controlling procedures and documents for technical support, including those important to environment, safety, and health. (TS.2-1) (H2/C2)
(See Concerns MS.1-1 and EA.2-2.)

CONCERN: There is no Sandia National Laboratories, Albuquerque, system to ensure proper design, review, control, and documentation of all facility modifications. (TS.3-2) (H2/C2)
(See Concerns FR.1-1, OP.3-1, WS.5-3.)

4.5.9 Packaging and Transportation

CONCERN: The overall management system does not provide control over packaging and transportation activities at Sandia National Laboratories, Albuquerque, as required by DOE 5480.3. (PT.1-1) (H2/C1)

CONCERN: There is no independent safety oversight, as required by DOE 5480.1B and DOE 5482.1B. (PT.1-2) (H3/C1)

CONCERN: There is no formal training and qualification program for all packaging and transportation employees, as required by DOE 5480.3 and 49 CFR Parts 100-199, 391, 392, 393 and 396. (PT.2-1) (H2/C1)

CONCERN: Quality assurance plans have not been developed for all packaging and transportation activities consistent with DOE 5700.6B. (PT.3-1) (H2/C1)

CONCERN: An emergency communications and response plan for packaging and transportation emergencies involving hazardous materials was not available, as required by 49 CFR 172.600. (PT.5-1) (H2/C1)

CONCERN: Operating procedures for packaging and transporting hazardous materials and radioactive and mixed wastes are not properly implemented and not uniform among organizational units. (PT.6-1) (H2/C2)

CONCERN: Sandia National Laboratories, Albuquerque, does not have access to an approved offsite disposal area for radioactive and mixed wastes. (PT.6-2) (H2/C2)

CONCERN: Onsite transportation of hazardous materials is not being controlled in accordance with the Sandia National Laboratories Onsite Transportation Manual. (PT.8-1) (H3/C2)

CONCERN: There were no independent internal safety appraisals of packaging and transportation made by Sandia National Laboratories, Albuquerque, as required by DOE 5480.3. (PT.11-1) (H3/C1)

4.5.10 Nuclear Criticality Safety

- CONCERN:** The Sandia National Laboratories, Albuquerque, Nuclear
(CS.1-1) Criticality Safety Program does not include the independent
(H2/C1) review to meet all requirements of DOE 5480.5, Section 9h(2).
- CONCERN:** The Albuquerque Operations Office does not perform frequent
(CS.1-2) appraisals of nuclear criticality safety. (See Concern QV.1-4.)
(H2/C2)
- CONCERN:** Sandia National Laboratories, Albuquerque, personnel do not
(CS.1-3) regularly receive Technical Safety Appraisal Noteworthy Practices
(H2/C2) or Unusual Occurrence Report Notices. (See Concern OA.1-5.)
- CONCERN:** Safety analyses have not been performed for fissile material
(CS.3-1) storage areas at Technical Area V, nor has the requirement been
(H2/C1) analyzed, as required by DOE 5481.1B. (See Concern AX.4-2.)
- CONCERN:** The Nuclear Criticality Safety Program at Sandia National
(CS.3-2) Laboratories, Albuquerque, does not provide evidence that the
(H1/C2) threshold mass limits are safe against credible contingencies.
- CONCERN:** Sandia National Laboratories, Albuquerque, has no requirement to
(CS.3-3) check input to nuclear criticality safety analyses, and no
(H2/C2) central file of nuclear criticality safety analyses is
maintained.
- CONCERN:** Posting of fissile materials storage limits at Sandia National
(CS.4-1) Laboratories, Albuquerque, does not, in all cases, meet the
(H2/C1) requirements of DOE 5480.5, Section 13b(4).
- CONCERN:** The criticality alarm systems at Sandia National Laboratories,
(CS.5-1) Albuquerque, do not satisfy all generally accepted elements of
(H2/C2) good industry practice.
- CONCERN:** The emergency response planning provisions of the Sandia National
(CS.5-2) Laboratories, Albuquerque, Nuclear Criticality Safety Program do
(H2/C1) not satisfy some requirements of DOE 5480.5, Section 8k. (See
Concerns EP.2-1 and FP.6-1.)
- CONCERN:** The Albuquerque Operations Office has not enforced provision of a
(CS.5-3) criticality alarm system at Sandia Pulsed Reactor, as required by
(H2/C1) DOE 5480.5, Sections 11c(3)(g) and 11c(3)(h).

4.5.11 Security/Safety Interface

- CONCERN:** The Sandia National Laboratories, Albuquerque, review system for
(SS.1-1) facility modifications, including security modifications, does
(H2/C2) not ensure review by all affected organizations for modifications
costing less than \$150,000.
- CONCERN:** The Sandia National Laboratories, Albuquerque, change control
(SS.1-2) process does not ensure that design changes are appropriately
(H2/C2) reviewed by all affected organizations.

CONCERN: The Sandia National Laboratories, Albuquerque, Operational
(SS.2-1) Security Systems Department Orders do not ensure unimpeded access
(H2/C2) and/or egress for all types of emergency vehicles when required.

CONCERN: Radiological controls in Technical Area V are not fully
(SS.2-2) coordinated with the security forces to ensure a proper balance
(H2/C2) between radiological safety and security.

CONCERN: Analyses of the consequences of using weapons and other
(SS.3-1) protective force equipment in the vicinity of safeguarded
(H2/C2) components and systems, and hazardous materials and processes,
have not been performed for all Sandia National Laboratories,
Albuquerque, facilities.

CONCERN: Security forces personnel have not received facility-specific
(SS.4-1) training on the potential consequences of using weapons and other
(H2/C1) protective force equipment in the vicinity of hazardous materials
and processes at all Sandia National Laboratories, Albuquerque,
facilities, as required by DOE 5480.16, Chapter I, paragraph
2.c.8.

4.5.12 Experimental Activities

CONCERN: Persons planning or conducting experiments do not have their
(EA.1-2) responsibilities and authorities clearly defined with respect to
(H3/C1) interfaces with the facility operations group, as required by
DOE Order 5480.19. (See Concerns OA.1-4, OP.1-3, MA.1-2, and
TS.1-2.)

CONCERN: Sandia National Laboratories, Albuquerque, has not developed and
(EA.2-2) implemented a program which ensures that all experiments are
(H2/C1) formally reviewed and approved prior to execution, as required by
DOE 5480.5, DOE 5480.6, DOE 5482.1B. (See Concerns FR.1-1,
FR.3-1, OA.2-2, and TS.2-1.)

CONCERN: The charters and membership makeup of the committees that perform
(EA.2-3) the reviews do not ensure an independent review, as required by
(H2/C1) DOE 5480.6 and DOE 5480.5. (See Concerns FR.1-1 and OA.2-2.)

CONCERN: Sandia National Laboratories, Albuquerque, has not established an
(EA.3-1) experimental activities process that is responsive to the safety
(H2/C1) needs of the facilities, as required by DOE 5480.5, DOE 5480.6
and DOE 5482.1B. (See Concern FR.3-1.)

CONCERN: Sandia National Laboratories, Albuquerque, does not have a
(EA.4-1) program to ensure that experimental activities are performed with
(H2/C1) the appropriate level of formality, and are performed without
increasing the risks previously evaluated for the facility or
site, as required by DOE 5480.19. (See Concern FR.3-1.)

4.5.13 Site/Facility Safety Review

- CONCERN:** There is no formal sitewide policy and requirements that cover the structure and operation of the facility safety review system to ensure consistent, uniform, independent reviews, as required by DOE 5480.1B, DOE 5481.1B, DOE 5480.5 and DOE 5480.6. (See EA.2-2, EA.2-3, EA.3-1, OA.2-2 and PT.11-1.)
(FR.1-1)
(H2/C1)
- CONCERN:** The Sandia National Laboratories, Albuquerque, institutional plan has not ensured that the internal, independent safety review system covers all operations, as required by DOE 5480.5, DOE 5480.6 and DOE 5482.1B.
(FR.1-2)
(H2/C1)
- CONCERN:** Reviews of site/facility activities have not been conducted effectively to ensure a high degree of safety. (See Concerns EA.3-1, SS.1-1 and EA.2-2.)
(FR.3-1)
(H2/C2)
- CONCERN:** Sandia National Laboratories, Albuquerque, performance of triennial appraisals has not satisfied all of the requirements of DOE 5480.5, DOE 5480.6 and DOE 5482.1B.
(FR.5-2)
(H2/C1)

4.5.14 Radiological Protection

- CONCERN:** Radiation protection activities at Sandia National Laboratories, Albuquerque, are being performed without definitive written guidance or rigorous professional oversight, resulting in inconsistency and noncompliance with Department of Energy requirements.
(RP.1-3)
(H2/C2)
- CONCERN:** Continued operation in noncompliance with Department of Energy radiation protection Orders, and mandatory standards has not been systematically evaluated.
(RP.1-4)
(H2/C2)
- CONCERN:** Internal audits of the Radiation Protection Program are not being conducted, as required by DOE 5480.11 and DOE 5482.1B.
(RP.2-3)
(H2/C1)
- CONCERN:** The system for documentation and followup of incidents of potential radiological significance is incomplete and does not apply sitewide.
(RP.2-4)
(H2/C2)
- CONCERN:** The Sandia National Laboratories, Albuquerque, procedure system is ineffective in providing for radiation protection.
(RP.3-2)
(H2/C2)
- CONCERN:** The certification process for operators of nonreactor radiation generating devices does not provide rigorous documentation of the requirements for certification, nor assurance that personnel have been trained, as required in DOE 5480.20, Attachment IV, Part 5.
(RP.3-3)
(H2/C1)
- CONCERN:** Controlled areas are not posted consistently, as required by DOE 5480.11, Section 9k.
(RP.3-4)
(H2/C1)

CONCERN: Sandia National Laboratories, Albuquerque, has not established
(RP.4-1) formal criteria for assigning personnel dosimeters, as required
(H2/C1) by DOE 5480.11.

CONCERN: A formal permit system for control of radiation work has not been
(RP.4-2) implemented by Sandia National Laboratories, Albuquerque.
(H2/C2)

CONCERN: The Sandia National Laboratories, Albuquerque, exposure control
(RP.5-2) program does not ensure nonemployee radiation exposure is
(H2/C1) maintained below the regulatory limit, as required by
DOE 5480.11.

CONCERN: Self-reading radiation dosimeters used at Sandia National
(RP.5-3) Laboratories, Albuquerque, are not included in the calibration
(H2/C1) program, as required by DOE 5480.11 and ANSI N13.5-1972.

CONCERN: The Internal Dosimetry Program is not yet fully implemented, as
(RP.7-2) required by DOE 5480.11, Section 9m.
(H3/C1)

CONCERN: Some radiation work is conducted without instruments while they
(RP.8-3) are removed for calibration.
(H2/C2)

CONCERN: Remote Area Monitors indicate incorrect readings.
(RP.8-4)
(H2/C2)

CONCERN: Personnel are permitted to enter and work in areas with a
(RP.9-1) potential for airborne radioactive contaminants that have not
(H2/C1) been monitored, as required by DOE 5480.11.

CONCERN: Sandia National Laboratories, Albuquerque, has no effective
(RP.10-2) radiation survey program to ensure that material released to the
(H2/C1) public meets the criteria established in DOE 5400.5.
CAT. II

CONCERN: Personnel may be exposed to radioactive contamination in excess
(RP.10-3) of Department of Energy limits and may transfer that
(H2/C1) contamination to other areas because some contaminated areas are
CAT. II not marked, nor are proper egress surveys performed, as required
by DOE 5480.11.

CONCERN: Not all high-efficiency particulate air filters used for cleaning
(RP.10-4) of gaseous effluent have been performance tested, as required by
(H2/C1) DOE 6430.1A, ANSI/UL 586, and ASME N 510-1989. (See Concern
AX.5-1.)

CONCERN: Glovebox gloves are frequently patched rather than replaced as
(RP.10-5) industry practice dictates.
(H2/C2)

CONCERN: Sandia National Laboratories, Albuquerque, has not addressed the
(RP.11-1) problem of the accumulation of unneeded contaminated facilities,
(H2/C2) and radioactive materials, nor have plans been developed to
reduce them as the as-low-as-reasonably-achievable (ALARA)
philosophy indicates.

CONCERN: The Albuquerque Operations Office has not addressed the problem
(RP.11-2) of the accumulation of unneeded contaminated facilities and
(H2/C2) radioactive materials, nor have plans been developed to reduce
them as the as-low-as-reasonably-achievable (ALARA) philosophy
indicates.

CONCERN: The Sandia National Laboratories, Albuquerque, As Low As
(RP.11-3) Reasonably Achievable Program (ALARA) for radiation protection
(H2/C1) does not fully meet the requirements of DOE 5480.11 and other
Department of Energy guidance.

CONCERN: Personnel exposure files do not contain all the radiological
(RP.12-1) information related to personal exposures and radiological
(H3/C1) working conditions, as required by DOE 5480.11.

CONCERN: The Sandia National Laboratories, Albuquerque, internal dosimetry
(RP.12-2) records are not generated and maintained, as required by
(H3/C1) ANSI N13.6 and DOE 5480.11.

4.5.15 Worker Safety and Health Compliance

CONCERN: Sandia National Laboratories, Albuquerque, is not in compliance
(WS.3-1) with the monitoring requirements of 29 CFR 1910.95, Occupational
(H1/C1) Noise Exposure; 29 CFR 1910.1025, Lead; and 29 CFR 1910.1048,
Formaldehyde.

CONCERN: Sandia National Laboratories, Albuquerque, does not have a
(WS.3-2) comprehensive confined space entry program and is not in
(H1/C1) compliance with Section 5(a)(1), "General Duty Clause" of the
Occupational Safety and Health Act of 1970.

CONCERN: Aisles, walkways, and ladders were not always maintained in a
(WS.4-1) clean and orderly manner, free of tripping hazards and
(H1/C1) obstructions, or meeting design criterion specified in
29 CFR 1910, Subpart D, Walking-Working Surfaces.

CONCERN: Not all exits were properly marked and adequately lighted, and
(WS.4-2) not all means of egress are to the nearest continuous and
(H2/C1) unobstructed exit, in accordance with 29 CFR 1910, Subpart E,
Means of Egress.

CONCERN: Compressed gas cylinders are not being visually inspected and
(WS.4-3) hydrostatically tested to determine if they are in a safe
(H2/C1) condition, as specified in 29 CFR 1910, Subpart H, Hazardous
Materials, and as prescribed in 49 CFR Parts 171-179 and
14 CFR Part 103, or with Compressed Gas Association Pamphlets
C-6-1968 and C-8-1962.

CONCERN: Emergency eyewash facilities are not supplied or readily
(WS.4-4) accessible in all areas where the eyes may be exposed to
(H2/C1) injurious, corrosive materials, as specified in 29 CFR 1910,
Subpart K, Medical and First Aid.

CONCERN: Sandia National Laboratories, Albuquerque, does not have an
(WS.4-5) effective program for the inspection, testing, maintenance,
(H1/C1) repair, and operation of cranes and hoists to ensure compliance
CAT. II with 29 CFR 1910.179, Overhead and Gantry Cranes.

CONCERN: An operator was observed performing an activity on the improperly
(WS.4-6) guarded HYPRO Vertical Turning Lathe, located in Bldg. 840, which
(H1/C1) put his life and safety in immediate peril. The machine guarding
CAT. I for the Vertical Turning Lathe did not meet the requirements of
29 CFR 1910.212(a)(1), Machine Guarding, and
29 CFR 1910.212(a)(2) General Requirements Machine Guards.

CONCERN: Guarding was not universally available and in place for equipment
(WS.4-7) in Sandia National Laboratories, Albuquerque, facilities, as
(H1/C1) required in 29 CFR 1910, Subpart O, for Machines and Tools with
CAT. II Moving and Rotating Parts.

CONCERN: Hand and portable powered tools and equipment are not being
(WS.4-8) maintained in a safe condition for use by employees, as specified
(H1/C1) in 29 CFR 1910, Subpart P, Hand and Portable Powered Tools and
Other Hand-Held Equipment.

CONCERN: Sandia National Laboratories, Albuquerque, does not comply with
(WS.4-9) 29 CFR 1910, Subpart S, Electrical, and in many cases, electrical
(H1/C1) hazards presented significant danger to employees.
CAT. II

CONCERN: Sandia National Laboratories, Albuquerque, is conducting
(WS.4-10) commercial diving operations that are not in compliance with
(H2/C1) 29 CFR 1910.410, Qualifications of Dive Team and 29 CFR 1910.421,
Pre-Dive Procedure.

CONCERN: Sandia National Laboratories, Albuquerque, is not in compliance
(WS.4-11) with 29 CFR 1910, Subpart L, Fire Protection.
(H2/C1)

CONCERN: Sandia National Laboratories, Albuquerque, is not in compliance
(WS.4-12) with 29 CFR 1910, Subpart H, Hazardous Materials.
(H2/C1)

CONCERN: Construction contractors are operating motor vehicles and
(WS.5-1) mechanized equipment at Sandia National Laboratories,
(H1/C1) Albuquerque, that are not in compliance with 29 CFR 1926,
Subpart O, Motor Vehicles and Mechanized Equipment.

CONCERN: Sandia National Laboratories, Albuquerque, is not in compliance
(WS.5-2) with 29 CFR 1926.21(b) in that personnel who are assigned
(H1/C1) oversight responsibilities for construction contracts are not
adequately trained to identify safety violations on motor
vehicles and mechanized equipment.

CONCERN: Construction contractor personnel are conducting hoisting and
(WS.5-3) rigging operations at Sandia National Laboratories, Albuquerque,
(H1/C1) that are not in compliance with 29 CFR 1926.251, Rigging
CAT. II Equipment for Material Handling, and 29 CFR 1926.550, Cranes and
Derricks.

CONCERN: Sandia National Laboratories, Albuquerque, is not in compliance
(WS.5-4) with 29 CFR 1926.21, Safety, Training, and Education in that
(H1/C1) personnel assigned to conduct oversight of hoisting and rigging
CAT. II equipment are not fully trained in crane inspection techniques.

CONCERN: Sandia National Laboratories, Albuquerque, does not fully comply
(WS.5-5) with construction standards 29 CFR 1926, Subpart L, Ladders and
(H1/C1) Scaffolding.

4.5.16 Industrial Hygiene

CONCERN: Sandia National Laboratories, Albuquerque, has not implemented
(IH.1-1) for its facilities an Industrial Hygiene Program with sufficient
(H3/C2) independent overview to ensure compliance with Industrial Hygiene
Subprograms and DOE 5480.10, and DOE 5483.1A.

CONCERN: Sandia National Laboratories, Albuquerque, industrial hygiene
(IH.1-2) management and supervision does not provide measurable and agreed
(H2/C2) upon goals and milestones for its professional and technical
staff members.

CONCERN: Sandia National Laboratories, Albuquerque, procedures and
(IH.2-1) documentation do not provide clear guidance to ensure that
(H2/C1) potential industrial hygiene hazards are recognized and corrected
and that industrial hygiene requirements are uniformly
implemented, as required by DOE 5480.10, and DOE 5483.1A.

CONCERN: Sandia National Laboratories, Albuquerque, does not have an
(IH.3-1) effective program to identify existing and potential health
(H2/C1) concern throughout their facilities, nor do they track
deficiencies required in DOE 5480.10, DOE 5483.1A, and
DOE 5481.1B.

CONCERN: Sandia National Laboratories, Albuquerque, does not have a
(IH.4-1) comprehensive monitoring and surveillance program of work
(H2/C1) activities and facilities to identify, control, document, and
trend the work environment and quantitatively establish controls,
as required by DOE 5480.10.

CONCERN: Sandia National Laboratories, Albuquerque, has not implemented a
(IH.5-1) hearing conservation program, as required by DOE 5480.10, and
(H1/C1) 29 CFR 1910.95.

CONCERN: Sandia National Laboratories, Albuquerque, Respiratory Protection
(IH.5-2) Program does not comply with ANSI Z88.2-1980, DOE 5480.10, and
(H1/C1) 29 CFR 1910.134.

CONCERN: NFPA 101, "Life Safety Code," means of egress requirements are
(IH.5-3) not being met while isolating laser laboratories.
(H2/C1)

CONCERN: Sandia National Laboratories, Albuquerque, lasers are not
(IH.5-4) consistently controlled according to Z136.1-1986, Section 4, for
(H2/C2) lasers without protective housings. (See Concern IH.1-1.)

CONCERN: Sandia National Laboratories, Albuquerque, is not in compliance
(IH.5-5) with carcinogen control requirements for either laboratory or
(H1/C1) nonlaboratory areas, as required by DOE 5480.10. and those
mandated by DOE 5480.4.

CONCERN: Posting of hazards was sometimes ambiguous and not in conformance
(IH.6-1) with requirements of by DOE 5480.4.
(H2/C1)

CONCERN: Sandia National Laboratories, Albuquerque, Industrial
(IH.6-2) Hygiene/Toxicology Programs/Subprograms such as PG470020,
(H3/C1) "Industrial Hygiene Recordkeeping Management," February 14, 1991,
do not require employee notification of monitoring results
exceeding Permissible Exposure Limits, as required in DOE
5480.10.

CONCERN: The Sandia National Laboratory, Albuquerque, has not implemented
(IH.6-3) the posting and labeling requirements of 29 CFR 1910.1200.
(H2/C1)

4.5.17 Occupational Safety

CONCERN: Sandia National Laboratories, Albuquerque, has not implemented an
(OS.1-1) independent internal audit or appraisal program to evaluate the
(H2/C1) effectiveness of the Occupational Safety Program, as required by
DOE 5483.1A.

CONCERN: The Albuquerque Operations Office has not required Sandia
(OS.1-2) National Laboratories, Albuquerque, to submit action plans for
(H1/C1) abatement of Occupational Safety and Health Act noncompliance
issues which conform to DOE 5483.1A.

CONCERN: Long-standing Occupational Safety and Health Administration
(OS.1.3) compliance deficiencies were identified which Sandia National
(H1/C2) Laboratories, Albuquerque, is not managing in accordance with the
most restrictive Department of Energy requirements.

CONCERN: Professional health and safety oversight of service
(OS.1-4) subcontractors, to ensure that activities conducted conform to
(H2/C1) DOE 5480.9, 29 CFR 1910.1200, and 29 CFR 1926.59, is not
performed.

CONCERN: Sandia National Laboratories, Albuquerque, has not developed,
(OS.2-1) communicated, or implemented an occupational safety program
(H2/C1) document or documents responsive to DOE 5483.1A or requirements
mandated by DOE 5480.4.

CONCERN: The Laboratory has not defined or implemented a hoisting and
(OS.2-2) rigging program which meets the requirements mandated by DOE
(H2/C1) 5480.4 and recommended by the Department of Energy, Hoisting and
Rigging Manual.

CONCERN: Sandia National Laboratories, Albuquerque, has not developed a
(OS.2-3) comprehensive safety and maintenance program for fork trucks to
(H2/C2) ensure compliance with 29 CFR 1910.178.

CONCERN: Sandia National Laboratories, Albuquerque, has not established a
(OS.2-4) program to ensure that fixed ladders are designed and maintained
(H2/C1) in accordance with 29 CFR 1910.27.

CONCERN: The current construction project review system for projects
(OS.2-5) costing less than \$150,000 at Sandia National Laboratories,
(H2/C1) Albuquerque, does not ensure that facilities will be designed in
compliance with the Occupational Safety and Health Act, as
required by DOE 5483.1A, DOE 5480.10, and those mandated by
DOE 5480.4.

CONCERN: Within Sandia National Laboratories, Albuquerque, there is no
(OS.4-1) program or other documented requirement for periodic monitoring
(H1/C1) of physical stressors as required by DOE 5480.10 and DOE 5483.1A.

CONCERN: Sandia National Laboratories, Albuquerque, does not conform to
(OS.4-2) ANSI Z87.1 recommendations regarding eye protection, as required
(H1/C1) by DOE 5480.4.

CONCERN: The Laboratory is not communicating chemical and physical hazards
(OS.5-1) information to subcontractor personnel, as required by
(H2/C1) 29 CFR 1910.1200, 29 CFR 1910.1450, or 29 CFR 1926.

4.5.18 Fire Protection

CONCERN: Sandia National Laboratories, Albuquerque, Fire Protection
(FP.1-1) Engineering staff does not provide the level of inspection and
(H2/C1) surveys at the frequency required by DOE 5480.7 and the "improved
risk" level of fire protection.

CONCERN: The Albuquerque Operations Office is not conducting periodic fire
(FP.1-2) protection appraisals, as required by DOE 5480.7.
(H2/C1)

CONCERN: NFPA 101, "Life Safety Code," requirements are not being met, as
(FP.2-1) required by DOE 5480.7.
(H2/C1)

- CONCERN:** The loss of the acid duct system in Building 858 due to a credible fire could shut down the clean room operations for more than 6 months contrary to the fire loss criteria of DOE 5480.7.
(FP.4-1)
(H2/C1)
- CONCERN:** Buildings have been identified by Sandia National Laboratories, Albuquerque, that require improvements in the fire protection system to ensure that maximum credible losses are kept to the lowest acceptable value per DOE 5480.7, DOE 6430.1A, and DOE/EV-0043.
(FP.4-2)
(H2/C1)
- CONCERN:** Fire Protection Engineering has not determined the Fire Loss Potential (Maximum Possible and Maximum Credible) for the installation of the new Cray Computer in Bldg. 880, as required by DOE 5480.7. (See Concern FP.1-1.)
(FP.5-1)
(H2/C1)
- CONCERN:** Inspection and prefire plan updates are not being done at the frequency required by DOE 5480.7 and the "improved risk" level of fire protection. (See Concerns CS.5-2 and EP.2-2.)
(FP.6-1)
(H2/C1)
- CONCERN:** The Fire Protection Engineering Program is not required to review and approve all new projects, building modifications, and renovations, as required by DOE 5480.7. (See Concerns OS.2-5, SS.1-1, FR.3-1, TS.3-2, and FP.5-1.)
(FP.7-1)
(H2/C1)
- CONCERN:** Fire protection systems and equipment are not inspected, tested, and maintained in full compliance with National Fire Protection Association Codes and Standards and "improved risk" level of fire protection, as required by DOE 5480.4 and DOE 5480.7.
(FP.7-2)
(H2/C1)
- CONCERN:** A formal system has not been established to meet the "improved risk" level of fire protection, as required by DOE 5480.4 and DOE 5480.7.
(FP.7-3)
(H2/C1)

4.5.19 Medical Services

- CONCERN:** Sandia National Laboratories, Albuquerque, has not implemented an Occupational Medical Program or established support systems of sufficient depth and scope to comply with DOE 5480.8. (See TS.2-1, FP.4-2, and OA.7-3.)
(MS.1-1)
(H2/C1)
- CONCERN:** Medical services provided by contractors for Sandia National Laboratories, Albuquerque, employees offsite lack the direction and documentation to assure management that medical services are being uniformly and efficiently delivered in accordance with DOE 5480.8.
(MS.1-2)
(H2/C1)
- CONCERN:** The Sandia National Laboratories, Albuquerque, Medical Directorate, lacks the documentation to assure management that medical services are being uniformly and efficiently delivered in accordance with DOE 5480.8. (See Concern QV.1-1.)
(MS.2-1)
(H2/C1)
- CONCERN:** The medical staff needed to support the site and facility are not available and trained, as required in DOE 5480.8, Section 7.8.F.
(MS.3-1)
(H2/C1)

- CONCERN:** The medical facilities and the medical equipment needed to support the site are not of sufficient depth and scope to meet the requirements of DOE 5480.8., Section 7.g. (See FP.4-2.)
(MS.3-2)
(H2/C1)
- CONCERN:** Special medical assessments are not made to prevent recurring medical occurrences associated with cooking and serving food in food vending areas.
(MS.3-3)
(H2/C3)
- CONCERN:** The Medical Directorate personnel have not been included in emergency exercise drills sufficiently to ensure that high quality care is provided in all types of emergencies, as required in DOE 5480.8, Section 7.e.
(MS.4-1)
(H2/C1)
- CONCERN:** Sandia National Laboratories, Albuquerque, management has not implemented all requirements of 29 CFR 1910.20.
(MS.5-1)
(H2/C1)

4.5.20 Explosive Safety

- CONCERN:** Safety meetings in which explosives safety matters are discussed are held too infrequently.
(ES.1-1)
(H2/C2)
- CONCERN:** Sandia National Laboratories, Albuquerque, safety personnel do not provide environment, safety, and health internal appraisals or frequent oversight of explosives activities.
(ES.1-2)
(H2/C2)
- CONCERN:** The Kirtland Area Office safety personnel do not provide frequent environment, safety, and health oversight of explosives activities at Sandia National Laboratories, Albuquerque.
(ES.1-3)
(H2/C2)
- CONCERN:** The Ad Hoc Sensitivity Review Committee for explosives safety does not provide for line management concurrence for introduction of new explosive energetic material.
(ES.2-1)
(H2/C2)
- CONCERN:** The Sandia National Laboratories, Albuquerque, explosives training and qualification program does not comply with the requirements, scope, and responsibilities specified by Chapter V, DOE/EV/06194, Explosives Safety Manual.
(ES.4-1)
(H2/C1)
- CONCERN:** There is no procedure or systematic method for posting of placards listing explosives and personnel limits at explosives-operating areas.
(ES.5-1)
(H2/C2)
- CONCERN:** Explosives storage was not in compliance with storage compatibility requirements listed in Chapter II, Paragraph 17.4, DOE/EV/06194, Explosives Safety Manual.
(ES.7-1)
(H1/C1)
- CONCERN:** A Sandia National Laboratories, Albuquerque, Storage Review Program, as required by Paragraph 17.3, Chapter II, DOE/EV/06194, Explosives Safety Manual, has not been established.
(ES.7-2)
(H1/C1)

4.5.21 Firearms Safety

- CONCERN:** Sandia National Laboratories, Albuquerque, is not in compliance with the application of DOE 5480.16 and AL 5480.16 for firearms activities other than those of protective force security.
(FS.1-1)
(H2/C2)
- CONCERN:** The scope of AL 5480.16 has been written by the Albuquerque Operations Office in such a way that it has been interpreted by Sandia National Laboratories, Albuquerque, to apply only to security operations.
(FS.1-2)
(H2/C1)
- CONCERN:** Practices of some high-risk activities such as loading/clearing and handling of firearms do not reflect procedures stated in Sandia National Laboratories, Albuquerque, Special Order No. 1 and requirements in DOE 5480.16.
(FS.2-1)
(H1/C1)
- CONCERN:** There is no Sandia National Laboratories, Albuquerque, documentation to ensure that appropriate procedures, policies, and reporting are developed at the Terminal Ballistic Facility or for other Sandia National Laboratories, Albuquerque, operations using firearms.
(FS.2-2)
(H2/C2)
- CONCERN:** Although annual appraisals of Sandia National Laboratories Operational Security Services Department operations have been conducted by Sandia National Laboratories, Albuquerque, and the Albuquerque Operations Office, some hazardous conditions and practices have not been identified and corrected. (See Concern QV.1-3.)
(FS.3-1)
(H2/C2)
- CONCERN:** There is no program to ensure that Sandia National Laboratories, Albuquerque, management are informed through annual appraisals of the status of firearms operations of organizations other than security.
(FS.3-2)
(H2/C2)
- CONCERN:** There is no program to ensure that Albuquerque Operations Office management is informed through annual appraisals, as required by DOE 5480.16 and AL 5480.16, of the status of firearms operations of organizations other than security operations. (See Concerns FS.1-2 and QV.1-4.)
(FS.3-3)
(H2/C1)
- CONCERN:** A firearms safety training program for Sandia National Laboratories, Albuquerque, personnel working with firearms other than protective force personnel has not been established.
(FS.4-1)
(H2/C2)
- CONCERN:** Safety and health practices at the firing range do not assure the safety and health of employees, as required by 29 CFR 1910.
(FS.5-1)
(H2/C1)
- CONCERN:** There is no Sandia National Laboratories, Albuquerque, procedure or other mechanism to address hazards presented by the facilities at the Department of Energy Central Training Academy.
(FS.5-2)
(H2/C2)

CONCERN: There is no program to assure that the hazards at the Sandia National Laboratories, Albuquerque, Terminal Ballistics Facility small arms ranges have been recognized, controlled and remediated.
(FS.5-3)
(H1/C2)

CONCERN: Requirements of DOE 5480.16, Chapter I, have not been fully implemented at the Sandia National Laboratories, Albuquerque, firing ranges at the Terminal Ballistics Facility. (See Concerns FS.1-1 and FS.5-3.)
(FS.5-4)
(H2/C2)

CONCERN: Sandia National Laboratories, Albuquerque, Operational Security Services Department management does not ensure effective control over training exercises and associated devices (i.e., paint guns).
(FS.6-1)
(H3/C2)

CONCERN: Sandia National Laboratories, Albuquerque, Operational Security Services Department has not identified or developed procedures, as required by DOE 5480.16, for the transportation, control, and storage of Class 1.4S munitions offsite and at home for security inspectors.
(FS.7-1)
(H2/C1)

4.5.22 Firearms Safety DOE Protective Forces

CONCERN: A Firearms Safety Program has not been fully implemented in accordance with the compliance assurance and appraisal requirements of paragraphs 8.a and 8.b of DOE 5480.16 and paragraph 4.b.(1) of AL 5480.16.
(AL FS.1-1)
(H2/C1)

CONCERN: Responsibility for implementing and ensuring compliance with DOE 5480.16 and AL 5480.16 is not clearly defined or reflected in the Albuquerque Operations Office Protective Force Firearms Safety Program.
(AL FS.1-2)
(H2/C1)

CONCERN: Procedures and documentation required by DOE 5480.16 have not been effectively formalized or implemented for the Albuquerque Operations Office Protective Force.
(AL FS.2-1)
(H3/C1)

CONCERN: Annual appraisals, required by DOE 5480.16 and AL 5480.16, have not been conducted of the Albuquerque Operations Office Protective Force.
(AL FS.3-1)
(H3/C1)

CONCERN: The Albuquerque Operations Office Protective Force Firearms Safety Training Program has not been fully developed, and is not in compliance with DOE 5480.16 and AL 5480.16.
(AL FS.4-1)
(H2/C1)

CONCERN: No clearly defined ES&H responsibilities are in place to ensure the health and safety of Albuquerque Operations Office Protective Force employees for range operations.
(AL FS.5-1)
(H2/C2)

CONCERN: No system is in place to assure that exercises are conducted in accordance with DOE 5480.16.
(AL FS.6-1)
(H2/C2)

CONCERN: Documentation of procedures for transportation, handling, and
(AL FS.7-1) storage of munitions, as required by DOE 5480.16, is incomplete.
(H3/C1)

4.8.3 Tabulation of Concerns from DOE/EH-0087

TABULATION OF CONCERNS, DOE/EH-0087, "TECHNICAL SAFETY APPRAISAL OF THE SANDIA REACTORS, ACRR, SPR III, SANDIA NATIONAL LABORATORIES, ALBUQUERQUE" APRIL 1989

A. Organization and Administration

- CONCERN:** The oversight responsibilities between all the Departments,
(OA.1-1) Committees, and special staff positions that provide such oversight for reactor operations have not been institutionalized through proper documentation.
- CONCERN:** The root cause for the recurring staffing problems related to the
(OA.1-2) support and operations of the reactors has not been identified and adequately addressed.
- CONCERN:** The Sandia quality assurance plans for reactor activities do not
(OA.1-3) completely fulfill mandatory DOE requirements.
- CONCERN:** The Sandia system to correct reactor facility review and appraisal
(OA.4-1) findings or action items is not fully effective.
- CONCERN:** The Sandia quality assurance audit program for reactor operations
(OA.4-2) and activities is not fully effective (see Concern FR.4-1).
- CONCERN:** The Sandia Unusual Occurrence reporting system does not assure that
(OA.4-3) those responsible for directing operations and activities recognize and report all Unusual Occurrence events.
- CONCERN:** Controls of documents important to the safe operation of Sandia
(OA.6-1) reactors have not been effective.
- CONCERN:** Important substance abuse training not being provided to all
(OA.7-1) personnel who have frequent, detailed, and direct supervisory contact with the reactor operations staff.

B. Operations

- CONCERN:** No formal system exists for the preparation, content, format,
(OP.2-1) revision, distribution, and control of ACRR and SPR III operating procedures.
- CONCERN:** The reason for the reactivity drift in the Annular Core Research
(OP.3-1) Reactor has remained unexplained for almost 1 year, despite extensive physical measurements.
- CONCERN:** The rationale for changing the method for determining the Annular
(OP.3-2) Core Research Reactor transient rod bank worth was not adequately documented.

- CONCERN:** Reporting of the unexplained reactivity change at the Annular Core Research Reactor did not comply with the Technical Specifications and DOE 5000.3.
(OP.3-3)
- CONCERN:** There is no formal system for defining the content and maintenance of a reactor console log.
(OP.3-4)
- CONCERN:** The configuration control system for reactor modifications does not ensure that as-built drawings, revised procedures and manuals, and training are provided prior to systems operations and maintenance.
(OP.3-5)
- CONCERN:** Reactor operations management is not exercising adequate control over procedures and activities of outside support services which interact with the reactor and its safety-related systems and operations.
(OP.3-6)
- CONCERN:** Guidelines and procedures controlling the use, placement, removal, and accountability of electrical jumpers and tags or vital keys for the reactor systems or support systems are inadequate.
(OP.3-7)

C. Maintenance

- CONCERN:** Without a formal, disciplines deviation control system, deficient material could be installed in engineered safety features and in reactor systems which could adversely affect safe, reliable operations.
(MA.3-1)
- CONCERN:** The calibration recall system presently in use allows instruments which are in need of recalibration to remain in work areas, where they might be used in safety-related work activities.
(MA.5-1)
- CONCERN:** Maintenance activities for the reactor and their support systems are conducted, in many instances, without the use of written instructions, procedures, and formal programs.
(MA.7-1)

D. Training & Certification

- CONCERN:** Requirements for documentation of training and retention of records are inadequate.
(TC.1-1)
- CONCERN:** The selection criteria in the Technical Specifications for reactor supervisors do not meet DOE requirements for educational equivalency. Reactor operator candidates who only meet the minimum published Sandia requirements for selection have a low potential to complete the reactor operator training program.
(TC.2-1)
- CONCERN:** Reactor operators are not given health examinations to establish their fitness prior to their certification.
(TC.2-2)
- CONCERN:** Reactor operator and reactor supervisor initial and recertification training programs either do not document or do not address all needed subject matter.
(TC.2-3)

CONCERN: The requirements of the Sandia Safety Manual with respect to safety
(TC.4-1) training are not being met for personnel working in the reactor facilities.

CONCERN: There is no documentation of the training provided to the personnel
(TC.5-1) responsible for reactor-related maintenance and calibration.

CONCERN: Training manuals for reactor operator and reactor supervisor
(TC.7-1) training are inadequate.

E. Auxiliary Systems

CONCERN: The charcoal filters are not tested between replacements.
(AX.4-1)

F. Emergency Readiness

CONCERN: Management does not maintain adequate control of onsite emergency
(ER.1-1) response.

CONCERN: The effective transfer of information about an accident in
(ER.5-1) Technical Area V to the duty officer and/or the Emergency Operations Center in Technical Area I is not assured.

G. Technical Support

CONCERN: Reactor personnel do not have a program to ensure complete
(TS.1-1) compliance with mandatory DOE standards for facility modifications.

CONCERN: Technical Specifications are not up to date and contain ambiguous
(TS.3-1) entries.

CONCERN: A third party cannot evaluate the frequency or severity of
(TS.5-1) incidents, determine trends, or review procedural errors because a system for reporting all incidents associated with the reactors does not exist.

CONCERN: Appropriate response to criticality alarms has not been addressed.
(TS.9-1)

CONCERN: The need for a criticality monitor at ACRR during handling and
(TS.9-2) storage of experiments at ACRR has not been evaluated.

I. Experimental Activities

CONCERN: There is no formal procedure institutionalizing the present
(EA.1-1) successful Experiment Plan and giving the experimenter the details of the steps necessary for preparation of the Plan.

CONCERN: The Sandia internal review and inspection system has not been
(EA.2-1) effective in discovering deficiencies in a number of areas associated with experiments.

J. Facilities Safety Review

- CONCERN:** ACRR and SPR III line management is not submitting to the Sandia Reactor Safety Committee in a timely manner all items required to have an independent safety review.
(FR.2-1)
- CONCERN:** The Sandia independent review and quality assurance functions have been ineffective in identifying weaknesses in the day-to-day operations of Sandia reactors.
(FR.4-1)
- CONCERN:** The triennial appraisal of reactor safety review systems is not in sufficient detail to identify opportunities for safety review system improvements.
(FR.5-1)

L. Radiological Protection

- CONCERN:** The ES&H Department had not provided adequate radiation protection guidance to the line organizations.
(RP.1-1)
- CONCERN:** Independent in-depth audits and inspections of the radiation protection program were not conducted.
(RP.1-2)
- CONCERN:** Internal audits of the radiation protection program were not being conducted, as required by DOE Orders, Sandia Laboratories instructions, and the Sandia contract.
(RP.2-1)
- CONCERN:** No formal documentation and tracking system exists for radiological incidents other than for Unusual Occurrences.
(RP.2-2)
- CONCERN:** Procedures for implementation of the reactors' health physics program were incomplete.
(RP.3-1)
- CONCERN:** There was no performance or location analysis documentation for fixed nuclear accident dosimeters.
(RP.5-1)
- CONCERN:** There was no documented internal radiation exposure control program for the reactor facilities.
(RP.6-1)
- CONCERN:** There was no internal dosimetry program for the reactor areas.
(RP.7-1)
- CONCERN:** The supply of radiation instruments readily available at the reactors was marginally adequate to meet routine and emergency needs.
(RP.8-1)
- CONCERN:** Remote Area Monitor (RAM) meters in the control room and health physics office did not reflect the local readings at the RAMs.
(RP.8-2)
- CONCERN:** There was no documented air monitoring program for the reactor facilities.
(RP.10-1)

M. Personnel Protection

- CONCERN:** There is no effective program which permits the industrial hygiene staff to identify health hazards.
(PP.1-1)
- CONCERN:** Routine workplace monitoring is not performed to document that exposures to toxic substances and stressful physical agents are below limits and to analyze trends.
(PP.2-1)
- CONCERN:** The respiratory protection program does not comply with ANSI Z88.2 in that program administration, procedures, the hazard evaluation process, training and annual internal audits are all deficient.
(PP.2-2)
- CONCERN:** There is no hazard communications program for the reactors.
(PP.3-1)
- CONCERN:** The professional industrial hygiene staff, who are best able to assure the health protection of the workers, have no documented responsibility to do so.
(PP.4-1)
- CONCERN:** The system for review, approval, and authorization of operational procedures does not assure identification of all hazardous activities.
(PP.7-1)
- CONCERN:** The lifting of loads with the Annular Core Research Reactor bridge crane over personnel is inconsistent with Sandia and DOE recommended practice and presents a potential for accidental death or injury.
(PP.7-2)

4.9 TEAM COMPOSITION AND AREAS OF RESPONSIBILITY

<u>Area of Responsibility</u>	<u>Name/Organization</u>
EH Senior Manager	Richard J. Serbu Office of Safety Appraisals Department of Energy
Team Leader	Steve K. Singal Office of Safety Appraisals Department of Energy
Associate Team Leader	Leonard M. Lojek Office of Safety Appraisals Department of Energy
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Maintenance and Auxiliary Systems	Lewis S. Masson SCIENTECH, Inc. Harry W. Heiselmann SCIENTECH, Inc.
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5.0

Management Assessment

5.0 MANAGEMENT ASSESSMENT

5.1 PURPOSE

The Management Subteam conducted a management assessment of ES&H programs and their implementation at SNL, Albuquerque. The objectives of the assessment were to (1) evaluate the effectiveness of existing management functions and processes in terms of assuring environmental compliance, and the health and safety of workers and the general public; and (2) identify probable root causes for ES&H findings and concerns.

5.2 SCOPE

Organizations reviewed were Sandia Corporation; SNL, Albuquerque; AL (including KAO); Albuquerque Microelectronics Operation; and the Central Training Academy.

The scope of the assessment covered the following ES&H general management issues: corporate policy and culture, organization, planning, human resource management, management systems, public and institutional interactions, and DOE oversight. More specifically, these issues included policies and procedures; roles, responsibilities, and authorities; management commitment; communication; staff development, training, and certification; recruitment; fitness-for-duty; compliance management which covers such items as configuration management systems, emergency planning and preparedness, QA, and the "lessons learned" program; self assessment; internal independent assessment; external assessment; and performance measurement.

Interviews were conducted with senior, middle, and first-line management, working level staff at DOE and SNL, Albuquerque, labor union representatives, regulators, local government officials, and community groups. It should be noted that the President of Sandia Corporation is a member of the Sandia Corporation Board of Directors and is a Vice President of AT&T. Documents reviewed included: DOE and AL Orders, the DOE contract with AT&T, the Sandia Corporation Strategic Plan, the SNL, Albuquerque, Institutional Plan, policies, procedures, manuals, subcontract formats, mission and function statements, implementation plans, budgeting and financial reports and records, audit, appraisal, and surveillance reports, self-assessment reports, job descriptions, individual performance plans and appraisals, and training materials and records.

5.3 APPROACH

The Management Subteam conducted its assessment in accordance with the Tiger Team Guidance Manual (February 1990). The Subteam coordinated with the Environmental, and Safety and Health Subteams to share information and ideas on management issues identified during the Tiger Team Assessment, as well as to identify management issues that might be common to the findings of all subteams. The causal factors identified by all subteams were considered in the evaluation of root causes.

The Management Subteam was aided in its evaluation by draft "Performance Objectives and Criteria for Tiger Team Management Assessments." These performance objectives and criteria were one element used to evaluate findings gathered in the course of the review.

Initially, the Subteam developed an understanding of AL, KAO, and SNL, Albuquerque, senior management expectations for management of ES&H activities. This was followed by a review of supporting documentation describing the organization, roles, policies, plans, procedures, performance criteria, funding, etc. for ES&H organizational elements, operations, and programs at these organizations. The Subteam also conducted interviews to develop an understanding of the perceptions of DOE Headquarters, AL, KAO, SNL, Albuquerque, SNL subcontractors, regulators, and unions with respect to ES&H activities.

The Subteam's observations were supplemented by information and observations by the Environmental, and Safety and Health Subteams. Preliminary data and conclusions were developed and factually validated through further document reviews and followup discussions with managers and staff at AL, KAO, and SNL, Albuquerque.

5.4 MANAGEMENT ASSESSMENT SUMMARY

The management key findings at AL and SNL, Albuquerque, were in the following areas: oversight, planning, management systems, and training. These findings trace their roots to AL's response to the historic priority placed on program performance by Defense Programs; the SNL, Albuquerque, response to program customer demands; and the set of SNL, Albuquerque, values which, while effective in achieving programmatic objectives, is not fully compatible with ES&H requirements.

Both AL and SNL, Albuquerque, however, have reordered their priorities to emphasize accomplishment of the DOE ES&H initiatives. At AL, there has been the establishment of KAO, substantial increases in ES&H staffing throughout AL, and increased emphasis on waste minimization (current waste minimization goals include a ten percent reduction in FY 1991 and 5 percent reduction per year for FY 1992 through FY 1995).

The SNL, Albuquerque, senior managers are committed to ES&H excellence, and they have effectively communicated to and imprinted their commitment on all levels of the organization. At SNL, Albuquerque, there have been numerous management initiatives which, if integrated organization-wide and carried to their conclusion, can result in ES&H excellence. These initiatives include: an ES&H Strategic Plan, an ES&H Improvement and Compliance Program, a Sandia ES&H Council, a Line Implementation Working Group, a Line Managers ES&H Action Team, a Regulatory Compliance Division to conduct independent appraisals of line ES&H activities, a Risk Management Division to review risk management documents created by line organizations, and a Process Quality Division to provide independent audits of the overall ES&H effort as part of the Quality Program.

These initiatives are in varying stages of development and provide a sound basis for a mature ES&H program to emerge. The majority of the findings in the management assessment concern programs that have not been fully implemented, rather than inappropriate or nonexistent programs.

A number of the management findings at SNL, Albuquerque, can be attributed to inadequate internal oversight: deficiencies were found in the independent review system, performance of independent appraisals, oversight of

construction subcontractors, and review of non-DOE funded work and Cooperative Research and Development Agreements.

Another area of significant concern is planning. Sandia Corporation has a corporate-wide strategic plan, but has not developed subordinate implementation plans to define, guide, and accomplish, in an integrated manner, both DOE's ES&H and program objectives at SNL, Albuquerque. A further area of concern is that management systems are not in place to control resources, monitor performance, and provide management with information necessary for ES&H decision-making. Finally, SNL, Albuquerque, does not have a formal sitewide training, verification and certification program to ensure that fully qualified personnel are performing ES&H activities: it appears that SNL, Albuquerque, management does not fully appreciate the magnitude of the effort that will be necessary to meet sitewide training requirements.

At AL, the management findings were concentrated in the area of oversight. Principal issues included the informality and limited scope of AL oversight; insufficiency of sitewide management system appraisals; a lack of formality and discipline in surveillance schedules; inadequate tracking, trending and root cause analysis; and uncertainties by KAO staff regarding their ES&H roles, responsibilities, and authorities.

However, it should be noted that AL has undertaken many ES&H related initiatives such as: the formation of seven new organizations for enhanced ES&H initiatives (including KAO); implementation of a budget and resource management system giving visibility to the functional areas for intelligent priority decisions; reallocation of personnel to assure technical capabilities were enhanced within area offices and AL; enhancement of AL's approach to technical training (i.e., Fundamentals of DOE Operations); long term programs to enhance the overall posture of DOE's operations such as Waste Minimization (3/90), Performance Indicator trending and root cause analysis (4/90) and Building Representative/Surveillance Instructions (12/90); and the initiation of the Leadership through Quality Program.

Continuing and vigorous management involvement at both AL and SNL, Albuquerque, is required. Considerable effort has taken place to formulate, develop, and implement plans to achieve ES&H compliance. SNL, Albuquerque, management has visibly demonstrated its commitment to DOE's ES&H initiative by assigning senior technical staff and managers from line organizations to ES&H leadership roles.

SNL, Albuquerque, has made a strong start. Its ultimate success in achieving ES&H excellence will depend as much on the priority established by DOE for such achievement, as on the SNL, Albuquerque, resolve to maintain the momentum.

5.5 MANAGEMENT FINDINGS

Finding MF-1: Sandia Corporation Strategic Planning

Sandia Corporation's Strategic Plan does not have subordinate implementation plans, which integrate ES&H into the overall mission to define, guide, and accomplish ES&H and programmatic objectives.

Discussion

Sandia Corporation manages major facilities at Albuquerque, New Mexico; Livermore, California; and several test sites which share many common elements of ES&H compliance and programmatic activities. For this reason, as well as the benefits that can accrue from the effective use of ES&H resources and lessons-learned, a coordinated, integrated planning and implementation process can be the foundation of ES&H excellence.

Sandia Corporation, has formulated a strategic plan and has implemented a planning process to incorporate ES&H activities into its overall mission. In addition, a number of important ES&H planning activities and related planning documents have been produced. The Draft Institutional Plan, FY 1991-1996, dated May 1991, provides, for the first time, an extensive section entitled "Environmental, Safety and Health Management." SNL, Albuquerque, has also produced a number of ES&H planning documents; for example, "Visions, Objectives and Strategies" (SAND91-0677), an ES&H Action Plan, Rev. 0 (for Albuquerque, Tonopah and Kauai) and an ES&H Project Plan. In addition, the programmatic strategic planning documents exist to guide initiatives in its market sectors: Weapons Development; Energy, Environment, and Economic Competitiveness; National Security; and Applied Research and Technology Activities. However, these strategic business plans do not integrate ES&H activities into the overall mission. Collectively, these programmatic strategic plans and the ES&H planning documents do not represent an integrated, corporate strategic plan because they do not integrate ES&H considerations into programmatic initiatives. Sandia Corporation senior management recognizes the importance of a comprehensive, integrated strategic plan with subordinate implementation plans. It has established a phased planning approach to produce an integrated business and ES&H plan some time after August 1991; but a firm milestone for its completion has not been established.

Since Sandia Corporation has not yet completed the strategic planning process, including subordinate implementation plans, uniform planning guidance has not been communicated down the management line. However, a few organizations within SNL, Albuquerque, have taken the initiative to develop individual strategic plans. For example, while Organization 7000 (Technical Support) has not yet developed a strategic plan or provided formal planning guidance to its departments, the Facilities Construction Department (Organization 7850) developed a plan to incorporate ES&H activities into its traditional mission. While these examples of individual initiative are commendable, they will not result in uniform, corporate-wide implementation of ES&H activities and may actually cause greater fragmentation in the planning process.

Self-Assessment

This issue was partially addressed in the "Pre-Tiger Team Self-Assessment Report" (SAND90-2827). While the self-assessment recognized the lack of a high quality corporate process for short- and long-range ES&H planning, it did not address the integration of ES&H with mission planning on a corporate-wide basis.

Finding MF-2: SNL ES&H Budget Planning and Project Management

SNL, Albuquerque, has not fully integrated planning for ES&H resource requirements into the budget process, and has not fully implemented a project management system to track and measure cost, schedule milestones, and technical performance for ES&H activities.

Discussion

The DOE budget process is the mechanism by which funding requirements are identified, requested, and justified to Office of Management and Budget, and Congress. This process ultimately, determines how funds are appropriated to DOE and, subsequently, allocated to contractors. The quality of SNL's budget submission will directly influence the level of funding received for ES&H activities.

The DOE budget is prepared and presented for funding requirements two years in advance. A review of the process used by SNL and the FY 1993 budget documents (including management briefings) reveal that the focus for ES&H activities has been only on the current year. Estimates for the FY 1993 budget year were based on a preliminary target with limited task descriptions or justifications. The exceptions are the Environmental Restoration and Waste Management Programs.

To illustrate, SNL's, budget briefing to DOE on April 5, 1991, identified the following ES&H funding requirements:

<u>Funding Source</u>	<u>FY 1990</u>	<u>(FY 1991 Dollars)</u>			<u>FY 1993</u>
		<u>FY 1991</u>	<u>FY 1992</u>		
Indirect	\$13.0M	\$35.6M	\$35.7M		\$34.7M
Military Applications	20.0	33.4	33.4		33.4
Environmental Management	10.0	18.5	35.7		51.5

In the FY 1993 budget, SNL's ES&H request for two of the three funding sources (50 percent of total) reflected no increase. This is surprising since at the time of this presentation SNL, Albuquerque, had completed the Pre-Tiger Team Self-Assessment, which identified many new requirements for funds to be applied to ES&H activities.

SNL, Albuquerque, has noted that since the ES&H Action Plan, which identified \$475 million in funding requirements, was not issued until April 25, 1991, it was not possible to incorporate these requirements into the SNL, Albuquerque, FY 1993 budget. However, preliminary data would have been acceptable for inclusion in the budget.

An independent pricing validation of the budget estimates is required by the DOE Controller. It is difficult to validate estimates without work scope descriptions, method of accomplishments, and milestones. SNL does not conduct formal, independent validation of budget estimates, although, they indicated they understand the requirement and will attempt to put the system in place for the FY 1994 budget.

To ensure that ES&H activities are performed in an efficient and cost-effective manner, a management system to evaluate cost, schedule milestones, and technical performance is essential. SNL, Albuquerque, management has

previously identified the need for a project management system for all SNL, Albuquerque, activities. Within the past year, management directed that the development of such a system for ES&H be given priority attention. In February 1991, the ES&H Project Management Office was established to define and implement a project management system for projects identified in the SNL, Albuquerque, ES&H Action Plan. When implemented, it appears that SNL's project management system, as presently defined, will be satisfactory.

Self-Assessment

This issue was addressed in the "Pre-Tiger Team Self-Assessment Report." The Report noted that "there is no high-quality corporate process for short- and long-range planning and budgeting for ES&H." The need for a project management system was also identified.

Finding MF-3: Human Resources Management

SNL, Albuquerque, has not implemented a human resource management system to ensure that sufficient qualified and trained staff are available to carry out the Laboratory's ES&H responsibilities.

Discussion

The ability of SNL, Albuquerque, to carry out its ES&H responsibilities rests on the number, skill mix, and qualifications of its staff. The central importance of human resources to the Laboratory's mission is the basis for management's obligation to ensure that sufficient qualified staff are available throughout the organization; and that they are prepared to carry out tasks expected of them, as they assume new and higher levels of responsibility. SNL, Albuquerque, management has recognized the importance of qualified ES&H personnel, and that there are limited resources currently available. However, a human resource management system to identify and prioritize staff needs on a sitewide basis; to train and retrain staff; and to formally communicate individual and personal ES&H performance expectations is not yet fully functional.

A subordinate human resource implementation plan derived from integrated corporate strategic planning (See Finding MF-1.) does not exist. Consequently, SNL, Albuquerque, does not have a basis to forecast ES&H staff needs (e.g., qualifications, training, numbers) with precision. While Organization 3 has established a long range staffing plan, other line organizations cannot develop a needs based forecast until ES&H considerations are integrated into their planning process. As a result, actual staff needs, and the magnitude and nature of the training effort required remain poorly defined. (See Finding MF-4.)

The centerpiece of the human resource management system is the Responsibilities, Qualifications, Performance (RQP) Program. This computer-based program is intended to maintain a file of each employee's training records, training needs, skills, professional qualifications, and individual performance appraisal status. Currently the system can best be described as a prototype. While it is a functioning system, the inclusion of sitewide data is not complete. In addition, protocols have not been developed to verify the quality of data prior to inclusion into the database. For example, individual departments and divisions have taken the initiative to assemble and administer

training courses. While these initiatives are noteworthy, the training courses lack uniformity from division to division and may not lead to uniform or consistent levels of individual proficiency. Similarly, the Safety and Health Subteam observed, "Requirements (Training and Qualification) that do exist are not standardized, and the ES&H Training Division has no authority to effect standardization." (See Concern TC.1-2 in Section 4.5.) Therefore, if this training data is included in the RQP program without verifying the quality of training, the value of the system will be compromised.

The formal communication of individual ES&H performance expectations is an important element of personnel management. With the exception of Organization 3200, specific organizational ES&H goals and objectives have not been defined and communicated throughout SNL, Albuquerque. (Also see Concern OP.1-1 in Section 4.5.) As a result, management guidance on how to personalize organizational goals and objectives has not been communicated throughout the organization. This vital communication link is generally embodied in the performance appraisals and job descriptions contained in Personnel Data Sheets (PDSs). In general, specific ES&H performance expectations have not been incorporated into the personnel evaluation process or in individual job descriptions. (Also see Concerns TS.1-2 and OA.1-4 in Section 4.5.) However, an examination of the PDSs for several directorates revealed exceptions. For example, Organization 7467 developed a uniform PDS with specific individual ES&H performance expectations and applied the revised PDS in the 1990 review cycle. SNL, Albuquerque, management recognizes the importance of job-specific ES&H expectations and has made provisions to incorporate them in the next performance review cycle.

The requirement that most SNL, Albuquerque, employees must hold a "Q" clearance often delays the effective use of new-hires and impacts on the adequacy of available human resources that can assist in ES&H programs. The average length of time to secure a "Q" clearance was about 10.5 months in late 1990. In April 1990, SNL, Albuquerque, recognized the impact of this problem and requested and was granted permission from AL to submit requests for "QL" clearances which would provide "L" access in 3 to 4 months and a "Q" clearance after a full background investigation. Similarly, AL has taken aggressive actions to reduce the time required to secure "Q" clearances. AL has given added management attention to the process and has expedited clearance requests, especially for a few critical positions, including some ES&H positions. These actions on the part of SNL, Albuquerque, and AL have afforded some relief, namely that uncleared employees can now be escorted in security areas ten times per month and interim "L" clearances can be granted to some employees. However, the average time to acquire a "Q" clearance has not declined significantly. In the face of these security constraints, SNL, Albuquerque, will need to pursue other innovative approaches for utilizing new employees.

Self-Assessment

The SNL, Albuquerque, Pre-Tiger Team Self-Assessment partially addressed this finding. It identified the lack of sufficient ES&H personnel and the importance of individual performance goals and objectives, but did not recognize the relationship of human resource management planning to integrated strategic planning, and the impediments imposed by the lengthy, inflexible "Q" clearance process.

Finding MF-4: SNL, Albuquerque, ES&H Training

SNL, Albuquerque, has not established nor implemented a comprehensive, proactive, ES&H training program.

Discussion

SNL, Albuquerque, management has responsibility to ensure that personnel at all levels of the organization are qualified and, if necessary, certified to carry out their assigned ES&H roles and responsibilities. In addition, managers and staff must be prepared for future assignments which could be significantly different from their current duties and responsibilities. While SNL, Albuquerque, management recognizes the importance of implementing an effective sitewide ES&H training program, the current status can best be described as embryonic.

An effective training program generally flows from a strategic plan (See Finding MF-1) and its companion human resource management plan. (See Finding MF-3.) It is founded on a training needs identification process based on specific facility and functional requirements, and a job task analysis. SNL, Albuquerque, has not implemented such a comprehensive proactive ES&H Training Program. As a result, this assessment abounds with training-related findings. (See Concerns QV.1-2, OP.1-3, OP.6-1, MA.2-3, TC.1-2, TC.4-2, TC.4-3, and TC.9-1 in Section 4.5.) The Safety and Health Subteam characterized most training as "informal and undocumented and...not...effectively and consistently implemented." (See Section 4.4 of this Report.)

While it appears that SNL, Albuquerque, has one organization (ES&H Training Division) coordinating the ES&H training program, two types of training have been excluded from the purview of this group. The ES&H Training Division has responsibility for the generic training that applies to all SNL, Albuquerque, organizations (e.g., fire extinguisher awareness and fork lift training); but, responsibility for functional and facility specific training (e.g., emergency preparedness and medical training) resides in those organizations that have historically coordinated those training activities. Interviews indicate that there is confusion over the three types of training, and therefore, who has primary responsibility. A review of the artificial division between site, functional, and generic training is warranted.

It is logical to assume that the existing ES&H Training Plan will modify the strategic planning process, and the present training requirements accordingly. However, there are serious concerns that need to be addressed as this process evolves. The balance between the two training approaches of "buy vs. develop," has not been carefully considered. Thus, the strategy that formed the most recent version of the SNL, Albuquerque, training philosophy is unclear. The professional training staff at SNL, Albuquerque, does not provide adequate input into defining the existing training philosophy. The Safety and Health Subteam observed that "the ES&H Training Division has no authority to effect standardization." (See Concern TC.1-2 in Section 4.5.) Rather, significantly more input was provided by technical managers who are not training professionals and who may be caught in a potential conflict of balancing resources for training against resources for new programmatic initiatives. The course content of the more than 50 ES&H training courses at SNL, Albuquerque, have not been reviewed for suitability and applicability; nor have processes such as job task analyses to establish fundamental

certification requirements for specific disciplines been applied. (See Concerns TC.1-2 and OP.6-2 in Section 4.5.) If these systematic steps in training program development were accomplished, the requirements for training and education might change as a result.

Management recognizes the significance of training requirements in accomplishing the new ES&H initiatives as well as bringing SNL, Albuquerque, training programs closer to present industry standards. However, ES&H training needs have not been provided sufficient priority nor been subjected to sufficient analysis prior to initiation of the training program developmental efforts now underway. As a result, management significantly underestimated the size and scope of the training effort for an organization as large and diverse as SNL, Albuquerque.

Self-Assessment

The SNL, Albuquerque, "Pre-Tiger Team Self-Assessment Report" adequately addresses the general thrust of this finding.

Finding MF-5: AT&T ES&H Goals, Objectives, and Oversight of SNL, Albuquerque, ES&H Programs

American Telephone & Telegraph Company (AT&T), the party executing the prime contract with DOE for the operation of SNL, Albuquerque, by the Sandia Corporation (a wholly-owned subsidiary of AT&T), has not fully demonstrated its support for the ES&H programs conducted at SNL, Albuquerque, by establishing ES&H goals and objectives, and exercising appropriate oversight of progress toward those goals and objectives.

Discussion

Long-term accountability and commitment of the party ultimately responsible for performance of the contract for the operation of a DOE facility is an essential element in the establishment and continued existence of effective ES&H programs. To enable the government to benefit from AT&T's industrial and managerial skills, the government, in 1949, contracted with AT&T for the operation of SNL, Albuquerque, with a "no fee, no profit Contract on a no loss basis" on the part of AT&T and Sandia Corporation (SC).

By the terms of the contract, AT&T was obligated to "cause Sandia Corporation to execute this Contract and to perform the obligations imposed on Sandia Corporation by this contract." AT&T is also "responsible for, and shall supervise performance" of SC's obligations with respect to personnel policies and practices, procurement systems, and accounting and property control systems.

To accomplish these obligations, AT&T established the SC Board which is composed of seven members including four AT&T employees and two AT&T employees on loan to SC. The four AT&T employees on the SC board have high-level positions within AT&T. They provide AT&T with a presence and an oversight capability of SC. The President of SC is also a Vice President of AT&T. Further, AT&T has charged a specific AT&T officer with oversight of SC. This officer, in a letter dated August 7, 1990, to the Secretary of Energy, expressed AT&T's support for the establishment of an ES&H program at SNL, Albuquerque. By a resolution, dated November 5, 1990, the SC Board

established an Audit Committee. The Audit Committee, which is comprised entirely of AT&T employees, has broad authority to direct a review of any operational or management aspect of SC. The audit plan currently includes provisions for reviews of ES&H and nuclear safety activities. A specific AT&T ES&H audit proposal was submitted for comment to the President of SC on May 7, 1991. Since January 1991, the President of SC has submitted a monthly report to AT&T on ES&H matters. A management information document called the "Sandia Board Newsletter" is distributed internally each month to members of the SC Board. This management information document, which contains frank discussion of matters that should be of special interest to members of the SC Board, has regularly highlighted items related to ES&H. SC may call upon AT&T to provide ES&H expertise, and AT&T experts have been brought to SNL, Albuquerque, on request.

While many institutional changes have been initiated to implement the ES&H programs envisioned by DOE, AT&T has not established or imposed upon SC, its expectations through specific written ES&H goals and objectives (with appropriate oversight) to measure progress in meeting those goals and objectives. However, the President of SC has been orally informed by his immediate superior at AT&T that ES&H is a critical element of the President's performance. Even if ES&H goals were established for SC by AT&T, AT&T has no formal mechanism to monitor progress toward attaining those goals and objectives. Without goals and objectives and an oversight mechanism, it is unclear how AT&T can assure itself that SC is making satisfactory progress in implementing DOE's ES&H requirements and complying with its contractual obligations.

Self-Assessment

This issue was not addressed in either the SNL, Albuquerque, "Pre-Tiger Team Assessment Report" or the AL "Self-Assessment Report."

Finding MF-6: SNL, Albuquerque Independent Oversight

SNL, Albuquerque, oversight of ES&H activities does not provide for sufficient independence from the reviewed activities, does not involve appropriate levels of management, and has not included required appraisals of specific activities.

Discussion

The cornerstone of an effective ES&H program is the independent management oversight system. This system, through periodic independent appraisals of ongoing activities (facility and functional) and reviews of proposed new or modified programs, processes, and procedures, should provide management with the assurance that ES&H activities are consistent with applicable policies and requirements and that the information necessary for decision-making is available. These review activities are often accomplished by standing safety review committees, independent ES&H organizations, external review organizations or combinations of the above. The Safety and Health Subteam identified numerous deficiencies in the independent review system. (See Concerns EA.2-2, EA.2-3, EA.3-1, FR.1-1, FR.1-2, and CS.1-1 in Section 4.5.)

SNL, Albuquerque, is not performing independent appraisals of ongoing activities as required by DOE 5482.1B, 5480.5, 5480.6, and 5480.19. Some annual facility appraisals were performed in the past at the reactor and pulsed power facilities and elsewhere by the Safety, Health, and Environmental Appraisal Committee. However, these appraisals do not fulfill all the requirements of the cited Orders and no functional safety (e.g., fire protection, industrial hygiene) appraisals have been performed. In the future, these appraisals are to be performed by the ES&H Regulatory Assessments Division 3201, which, at the time of this review, was part of Organization 3200. (See Concerns OA.2-2, PT.11-1, RP.2-3, IH.1-1, OS.1-1, FP.1-1, and ES.1-2 in Section 4.5.)

A review of SNL, Albuquerque, proposed plans indicated that a conflict of interest existed regarding the activities of the ES&H Regulatory Assessments Division 3201. This Division, among other things, is responsible for performing ES&H functional appraisals of the 3200 Organization, of which it is a part. Subsequent to the identification of this issue by the Tiger Team, SNL, Albuquerque, corrected this deficiency by reassigning the 3201 Organization to report programmatically and administratively directly to the Vice President Organization 3. In addition, Organization 3200 is itself an operator of waste management facilities that has not, in the past, been subject to independent appraisals. The realignment of the 3201 Organization will now make this possible.

The SNL, Albuquerque triennial review process required by DOE 5480.5, 5480.6, and 5482.1B, is not sufficiently independent of the systems being reviewed. For example, the triennial reactor safety review required by DOE 5480.6 is performed by the line Vice President (Vice President 6000) and the triennial reviews required by DOE 5480.5 are performed by the 3200 Organization which is responsible for part of the independent review process that is to be reviewed. (See Concern FR.5-2 in Section 4.5.) SNL, Albuquerque, plans, in the future, to have these reviews performed by a new organization reporting to the President of SNL, Albuquerque. When implemented, this should correct the deficiency.

Review of the various safety review committees' activities indicates that the appropriate management level is not sufficiently involved in the decision-making process. For example, Class I experiments in the Pulsed Power Area are approved by the machine operator without any further review by supervision. The machine operator should be involved in these Class I reviews, however, the machine operator is generally neither a supervisor, nor does this individual always have sufficient background to be able to make the technical judgements necessary. The Reactor Safety Committee, which deals with significant potential safety concerns, provides its advice to line operating managers whose activities are under review, rather than the Vice President that appointed the Committee. The Sandia Radiological and Criticality Safety Committee has a subordinate committee in Technical Area V. This subordinate committee is much more active than the parent committee. Reviews performed by the subordinate committee are not reviewed by the parent committee, except retrospectively on an annual basis. This is not a good management practice for a committee of this type. The advice of the Committee and its subordinate committee is provided directly to the originator not to senior management. Therefore, the Committee is not acting in an advisory capacity to management, as required by DOE Orders, but instead acts as an organization directing the line.

Self-Assessment

The SNL, Albuquerque, "Pre-Tiger Team Self-Assessment Report" identified only the fact that appraisals were not being conducted. It did not identify issues related to objectivity or involvement by the appropriate level of management.

Finding MF-7: SNL, Albuquerque, Application of ES&H Considerations to Onsite Construction Subcontracts

SNL, Albuquerque, oversight of onsite construction subcontractors is not sufficiently comprehensive in terms of frequency and scope to ensure that subcontractors comply with ES&H requirements.

Discussion

The process of performing onsite construction, including minor facility modifications, involves several phases: planning and developing the construction project, preparation of contractual documents which include ES&H provisions, pre-bid and pre-construction briefings, and monitoring ongoing construction work. Recently, SNL, Albuquerque, has made significant efforts to strengthen the application of ES&H considerations in this process.

Subcontractors are required to assure that their employees receive appropriate ES&H training. However, SNL, Albuquerque, does not have a system to verify that training has occurred or that the training provided to subcontractor employees meets appropriate standards.

Existing subcontract terms do not place the same emphasis on environmental concerns as they do on health and safety concerns. To provide added emphasis for environmental matters, SNL, Albuquerque, will begin incorporating a "Contractor Environmental Safety and Health (ES&H) Compliance Certification" into construction subcontracts as Attachment 2. The SNL, Albuquerque, usage instructions for this contractor ES&H certification are still in draft stage.

SNL, Albuquerque, does not provide briefings covering ES&H topics to subcontract workers, prior to initial site entry. Training for SNL, Albuquerque, construction inspectors/observers has focused primarily on safety training, with little environmental training given. SNL, Albuquerque, construction inspectors/observers have been given general OSHA training, but are not trained in those specific areas of OSHA (i.e. OSHA subparts), such as electrical safety, which are likely to be key parts of their duties. Much of their practical training is obtained on-the-job. An additional concern is the lack of fitness-for-duty training given to SNL, Albuquerque, inspectors/observers. Generally, they have not been provided with fitness-for-duty training and thus are ill-prepared to recognize and deal with subcontractor employees who may be demonstrating the effects of substance abuse or psychological impairment. (Also see Concern OA.8-1 in Section 4.5.)

There is no formal, documented mechanism for SNL, Albuquerque, inspectors/observers to communicate their ES&H concerns to subcontractors or to subcontractors' employees.

SNL, Albuquerque, maintains a record of construction workers who have exhibited poor ES&H performance, but does not do a crosscheck on new subcontractor employees to ensure that a worker with a poor ES&H performance

record does not reenter the site as an employee of a different subcontractor, without first demonstrating the ability to provide acceptable ES&H performance.

Additional examples of insufficient application of ES&H considerations to construction subcontracts for projects less than \$150,000 are identified by the Safety and Health subteam in Concern OS.2-5 in Section 4.5.

Self-Assessment

This issue was partially addressed in the SNL, Albuquerque, "Pre-Tiger Team Self-Assessment Report" with respect to the level of training of inspectors/observers, and fitness-for-duty training of inspectors/observers. Verification of subcontractor employee training, subcontract terms and conditions, ES&H briefings, inspector/observer communication, and subcontractor employee index crosschecks were not addressed.

Finding MF-8: Building ES&H Coordinators

Building ES&H Coordinators do not fully understand the scope of their responsibilities and generally have not been adequately trained to carry out these responsibilities.

Discussion

In November 1990, SNL, Albuquerque, instituted a program of space "ownership" which focuses on housekeeping and ES&H compliance. (See Concern OA.2-1 in Section 4.5.) A key element in this program and, indeed, in the ES&H Improvement and Compliance Program, is the role of the Building ES&H Coordinators.

The principal duties of these coordinators, which are additional to their regular duties, are as follows:

- establish "ownership" of all spaces within and around the building,
- document the individual "ownership" of space, and
- maintain an overview of ES&H conditions in the building.

These duties include the requirements to make "frequent" inspections of the common-use areas "to identify and correct hazards or non-compliance;" to be aware of and understand ES&H concerns for the whole building; and to track corrective actions.

Interviews with a sampling of Building ES&H Coordinators revealed that many are not aware of the full nature and range of their responsibilities, and that most of them do not consider that they have been adequately trained to perform their duties. The latest SNL, Albuquerque, ES&H Training Catalog, distributed in March 1991, specifies a required course (MGT -150) for Building ES&H Coordinators. However, this course has not yet been developed.

Additionally, there is no process in place for the coordinators to meet, share, and profit from lessons-learned.

Self-Assessment

The SNL, Albuquerque, "Pre-Tiger Team Self-Assessment Report" addressed the training aspect of this finding, but did not address the awareness aspect.

Finding MF-9: SNL, Albuquerque, Configuration Management

SNL, Albuquerque, has not fully implemented a configuration management program that is necessary to control important ES&H procedures and other ES&H documents.

Discussion

Configuration management of important aspects of operations has been recognized as an necessary attribute of good management practices. DOE recognition of programmatic requirements are contained in DOE 5480.19 (Conduct of Operations) and DOE 5700.6B (General Operations Quality Assurance). The Institute of Nuclear Power Operations (INPO) has provided guidelines for commercial nuclear plants relating to configuration management and control; and, the U.S. Nuclear Regulatory Commission (NRC) places requirements on licensees for configuration management that includes control of blueprints, procedures, designs, operations, maintenance, construction, procurement, and personnel certification at licensee facilities. SNL, Albuquerque, has not revised and standardized its system to control procedures and other operations-related documents to conform with currently accepted configuration management practices.

An older system of procedures, "Safe Operating Procedures," has been in use at SNL, Albuquerque, for many years covering important activities. The formality and rigor of these procedures, particularly with respect to ES&H activities, varies across facilities and organizations, and centralized controls for changes and updates do not meet present standards of formality and detail except in the weapons areas. The differences in missions and character of activities between a research program and a weapons program provide a natural delineator with regard to formality of maintaining a configuration management program. The dynamic and changing nature of research creates additional difficulties for configuration management. As a result, a Generic ES&H Standard Operating Procedure (SOP), GN470000, "A Guide to Writing Activity Specific ES&H Standard Operating Procedures," the "procedure for procedures," was developed to provide a uniform basis for the configuration management and procedural controls for ES&H-specific activities. A series of SNL, Albuquerque, Laboratory-wide ES&H procedures have been identified and are termed "Generic ES&H Standard Operating Procedures." An example is GN470035, "Sandia Workplace Hazards Awareness System (SWHAS)," which requires procedural formality across the Laboratory, as applicable. Transition to this newer and more comprehensive system, relying on a set of Standard Operating Procedures, has not been completed throughout the Laboratory. (See Concerns OP.3-8, OP.3-9, OP.3-10, MA.8-2, and TS.2-1 in Section 4.5.)

Document and drawing control is another aspect of configuration management which has not been brought up to modern standards. For example, Engineering Procedures (EPs), such as EP401560, the required procedure for calibration and

labeling, are prescribed procedures for controlling processes including ES&H-related aspects of the activity. However, these procedures are subjected to configuration management requirements via the QA Program (Quality Plan). Unfortunately, the SNL, Albuquerque, Quality Plan, dated April 1986, is not current and is not adequately implemented. Thus, it has little impact on the operational success of ES&H activities, so configuration management as it pertains to ES&H procedures is relatively ineffective. (See Concerns OP.3-8 and QV.5-1 in Section 4.5 and Finding QA/CF-7 in Section 3.5.)

Other examples where the configuration management system is not effective (See Concern OP.3-8 in Section 4.5.) include:

- Lack of as-built drawings for the operations staff at most facilities.
- Most operating procedures and checklists were not identified as to the facility and equipment to which they were applicable and the effective date and revision number were not indicated.
- Configuration Control was deficient at both the Particle Beam Fusion Accelerator II and Technical Area III, where controlled copies were not maintained properly.

At present, only from 30 to 50 percent of the SNL, Albuquerque, SOPs have been incorporated into the system specified by SOP GN470000. Full implementation is expected by the end of Calendar Year 1991.

Self-Assessment

This finding was partially identified in the SNL, Albuquerque, "Pre-Tiger Team Self-Assessment Report" which noted that SNL, Albuquerque, does not have a consistent hierarchical structure of policies, programs and procedures. Configuration management was not specifically mentioned.

Finding MF-10: SNL, Albuquerque, Performance Monitoring And Assessment Systems

Performance monitoring and assessment systems, that include performance indicators, root cause analyses, corrective actions, tracking and trending, and lessons-learned, are not fully implemented at SNL, Albuquerque.

Discussion

In Secretary Watkins' memorandum of July 31, 1990, to the Managers of DOE Operations Offices, Subject: "Guidance on Environmental, Safety, and Health Self-Assessment," the need for formal systems that provide for tracking findings and taking corrective actions, performing root cause analyses, and identifying trends and mechanisms to communicate lessons-learned was formally defined. The position stated in this memorandum had been communicated previously by DOE Headquarters and represents the formal adoption by DOE of best management practices recommended by Institute for Nuclear Power Operations (INPO) and the NRC for the commercial nuclear power industry.

On January 11, 1991, SEN-29-91, "Performance Indicators and Trending Program for Department of Energy Operations," was issued and specified a definitive

set of performance indicators to be initially trended for review by the Office of the Secretary. These indicators were developed on the basis of a two-year Performance Indicator Pilot Program involving contractor organizations across DOE that voluntarily participated in the program. The trending system proposed in SEN-29-91 is to be operational throughout DOE, except for the Naval Nuclear Propulsion Program, by June 1991.

At present, SNL, Albuquerque, provides AL with incident reporting information. AL is responsible to assure that the abnormal events are placed into the Occurrence Reporting and Processing System for use by DOE. However this type of information is not used in an event reporting or a lessons-learned program by SNL, Albuquerque. (See Concerns OA.5-1, OP.1-1, and CS.1-3 in Section 4.5.) Industry-wide reporting systems, such as those used in the commercial nuclear power industry, have formed the basis for an effective lessons-learned program, whereby subscribers share not only event information, but also root cause determinations, and are able to independently assess the applicability of other events to their facilities in an attempt to reduce or eliminate the possibility of a similar problem occurring again.

Recognition of parts of this issue was noted in the DOE ES&H Appraisal of SNL, Albuquerque, performed January 14 through 25, 1991, and transmitted March 4, 1991, by memo from AL to KAO. Finding Number 12 of this Appraisal noted the lack of a formal system for communicating to SNL, Albuquerque, the lessons-learned for significant occurrences at other DOE facilities and recommended that a system for screening and subsequently communicating lessons-learned to applicable SNL, Albuquerque, facilities be established. Finding Number 4 of the Appraisal noted that trend analyses of safety performance data have not been used extensively at SNL, Albuquerque, to identify appropriate actions that can be used to improve safety performance. It appears that the limited sample of reported data is not used to maximum advantage. Finding Number 5 of the appraisal states that occurrence reporting by SNL, Albuquerque, tends to understate severity and significance, and fails to establish root causes.

While a set of performance indicators to be reported to DOE is specified in SEN-29-91, it represents only a subset of those which could be developed and used by SNL, Albuquerque, management to more effectively make sound decisions on ES&H issues, based on timely and accurate information, and historical trends. There are embryonic trending systems being used by various groups within the Laboratory, but generic tracking and trending systems being developed to meet SEN-29-91 have not been integrated to provide management with systematic, dependable information. The tracking and trending systems in use at SNL, Albuquerque, do not uniformly include self-assessment verification activities to assure consistency and integration of all organizational results reporting, mechanisms for conflict resolution, or guidelines on prioritization. The formal system used throughout SNL, Albuquerque, will not become operational until later this year. These systems are embodied in programs such as the "ES&H Self-Assessment Program," PG470093; the "ES&H Appraisal Program," PG470094; the "ES&H Performance Indicator Program," PG470095; and the "ES&H Operating Experience Evaluation Program," PG470096.

The performance objectives in PG470095 cover all aspects of a sound program and will meet the requirements stated in SEN-29-91 for a uniform reporting system if it is implemented with the same precision and thoroughness with which it has been planned.

Self-Assessment

The SNL, Albuquerque, "Pre-Tiger Team Self-Assessment Report" addressed the lack of a lessons-learned program in findings SF-TC-03, SF-OP-07, and SF-FR-04. Other important aspects of trending, root cause, and corrective actions were not addressed.

Finding MF-11: Conduct of Operations

At SNL, Albuquerque, many elements of operations (such as specified in DOE 5480.19) can be characterized as lacking or deficient in formality.

Discussion

Beginning in November 1989, DOE began an initiative to increase the formality and structure of operational activities by DOE Site Contractors, issuing a memorandum to DOE Operations Offices providing interim guidelines for conduct of operations and instructions for implementation. In July 1990, DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," was issued directing DOE contractors to comply with the newer requirements and to pursue application through a set of guidelines in 18 areas including operations, administration, and control area activities. The Order has three specific programmatic requirements. First, the Order should be used to guide the review and development of plans and procedures for the conduct of operations. Second, it should be applied with a graded approach. Third, a matrix should be prepared showing compliance status for each guideline.

Generally, the weapons programs historically have been required to have more formal policies, procedures, and operational guidelines than research programs. The historical SNL, Albuquerque, philosophy included a graded approach for formality of operations similar to the concept presented in the Order. However, it was primarily driven by the attitude that such formality was not necessary in the research environment since it could inhibit the creativity of researchers and result in increased costs. The possibility that a critical research facility might be temporarily lost (e.g., for a year or more due to some operational incidental) was not fully appreciated in considering risk or consequence.

There are many indications that various facilities at SNL, Albuquerque, are not in full compliance with DOE 5480.19. Furthermore, SNL, Albuquerque, staff acknowledge that full compliance with the Order has not yet been achieved and may not be achieved in the near future.

This assessment revealed many elements of operations that can be generally characterized as lacking or deficient in formality. These include:

- Basic organizational definition parameters, such as individualized formal job descriptions, including assignment of safety responsibilities and commensurate delegation of authority to accomplish safety responsibilities, did not exist for many management and staff personnel. (See Concerns OA.1-4, OP.1-3, and OP.1-4 in Section 4.5.)

- Definitive goals were not set and promulgated as a means of promoting a unified effort for achieving excellence in safety. (See Concern OA.3-1 in Section 4.5.)
- Periodic review and update of controlled documents were not performed. (See Concern OA.7-2 in Section 4.5.)
- Measurable performance indicators were not used as a mechanism to improve performance and increase the safety of operational activities. (See Concern OP.1-1 in Section 4.5.)
- Requirements for operating logs have not been established through policies or procedures. (See Concerns OP.2-2 and OP.3-2 in Section 4.5.)
- A configuration management system has not been established to assure control of critical records including design bases, equipment specifications, controls of procedures, and important descriptive documentation of facilities. (See Concern OP.3-8 in Section 4.5.)

SNL, Albuquerque, has undertaken the establishment of a potentially effective, and graded approach to a new conduct of operations program that is intended to meet the requirements of DOE 5480.19. The process for implementing such a program was described in "Conduct of Operations," PG470117, Issue B. It was initiated first with the creation of necessary program documents, then followed with an implementation prototype exercise that was integrated with risk management: and requirements, qualifications, and performance. The exercise was subsequently carried out in 20 volunteer organizations. Feedback from this exercise has resulted in the generation of PG470117, Issue C, not yet finalized, but which incorporates improvements and other lessons learned from the prototype defined in Issue B. The path chosen by senior management to implement DOE 5480.19 includes a clear statement that SNL, Albuquerque, will be in full compliance, and that the requirements of the Order will be integrated into SNL, Albuquerque, operations in a way that should assure maximum acceptance by the staff.

This proposed SNL, Albuquerque, approach was approved by Defense Programs (DP) in a letter from DP-26, dated April 3, 1991. The program represents the only approved Conduct of Operations Program within DP. Full compliance with the presently defined program is presently planned to occur by March 1993. This will require vigorous management involvement and attention to assure that the changes are institutionalized.

Self-Assessment

This finding was addressed in the SNL, Albuquerque, "Pre-Tiger Team Self-Assessment Report" as Key Finding, KF-03.

Finding MF-12: SNL, Albuquerque, ES&H Review of Non-DOE Funded Work and Cooperative Research and Development Agreements

The process for SNL, Albuquerque, ES&H review of Cooperative Research and Development Agreements (CRADAs) Joint Work Statements has not been established and the process for SNL, Albuquerque, ES&H review of non-DOE funded proposals

focuses on environmental requirements with minimal attention to safety and health impacts.

Discussion

SNL, Albuquerque, has a formal, structured process to evaluate non-DOE funded proposals in terms of technical feasibility, validity of cost estimates, use of subcontractors and compatibility with SNL, Albuquerque, mission. SNL, Albuquerque's, review process includes an evaluation of the proposals by the line organizations; and independent evaluation by the Work for Others (WFO) Program Office and the Controller's Office.

SNL, Albuquerque's, non-DOE funded work program has undergone numerous reviews by outside groups. These reviews emphasized business systems and technical execution, and concluded that, in these specific areas, SNL, Albuquerque, procedures were satisfactory and complied with DOE policy and program management expectations for non-DOE funded work. However, the evaluation process used by SNL, Albuquerque, provides only a limited review of environmental activities and essentially no review of safety and health concerns. While the process used by SNL, Albuquerque, includes an ES&H checklist which was completed by the line organization and reviewed by the WFO Program Officer, there was no formal mechanism to include a review by ES&H professionals, even in those cases where those completing the checklist indicated potential ES&H impacts.

SNL, Albuquerque, took action prior to the effective date of DOE 4300.2A, Change 2, to address this concern by modifying the ES&H checklist to include safety and health concerns and formalizing the review by ES&H professionals. DOE 4300.2A, Change 2, of March 27, 1991, now requires the more complete checklist which SNL, Albuquerque, has been using.

With respect to CRADAs, SNL, Albuquerque, uses the DOE CRADA guidelines which include an ES&H checklist to be completed by the preparer of the Joint Work Statement. The Technology Transfer and Industrial Relations Department processes the Joint Work Statements. However, this Department has not established procedures which would require ES&H review of Joint Work Statements, although they intend to establish procedures similar to those utilized by the WFO group.

Self-Assessment

This issue was not identified in the SNL, Albuquerque, "Pre-Tiger Team Self-Assessment Report."

Finding MF-13: AL/KA0 ES&H Oversight

AL oversight of SNL, Albuquerque, does not include periodic appraisals of all SNL, Albuquerque, sitewide ES&H management systems, or the day-to-day ES&H surveillance performed by the Kirtland Area Office lacks formality and discipline.

Discussion

AL has divided the ES&H oversight of SNL, Albuquerque, among three different organizations. Functional safety areas, such as fire protection and radiation protection, are the responsibility of the AL Office of Environment, Safety, and Health; management systems, such as conduct of operations and occurrence reporting, are the domain of the Waste Management and Operational Surety Division; and day-to-day surveillance is the responsibility of the KAO. Collectively, if functioning, this would be an acceptable oversight system. However, even though AL's Office of Environment, Safety, and Health is performing appraisals as required, two of these three organizational elements are not functioning satisfactorily in their oversight roles.

AL ES&H appraisals of SNL, Albuquerque, are primarily compliance oriented covering functional disciplines such as fire protection and industrial hygiene. Recently, AL conducted a Management Appraisal of SNL, Albuquerque, and intends to perform these appraisals on a three year cycle. These appraisals fulfill the requirements of DOE 5482.1B and are performed by the AL Office of Environment, Safety, and Health.

ES&H management systems such as independent oversight, performance monitoring and assessment (e.g., tracking, trending, root cause analysis), are the responsibility of the Waste Management and Operational Surety Division. Some of these management systems were reviewed during the triennial Management Appraisal performed by the AL Office of Environment, Safety, and Health cited above. KAO is performing four Facility Performance Assessments per year on high hazard facilities, along with approximately 75 surveillances (a rate which would require many years to cover the entire SNL, Albuquerque, site). This approach, which concentrates on facilities rather than the site as a whole, is not an effective nor efficient way to determine the adequacy of these ES&H management systems. (See also Concern OA.2-3 in Section 4.5 for additional management systems review deficiencies.)

The KAO surveillance of ES&H lacks the formality and discipline necessary to accomplish its oversight role of SNL, Albuquerque. Surveillance objectives are not clearly understood nor uniformly implemented by the KAO staff. For example, interviews with the KAO staff and document reviews indicated a lack of prescribed surveillance frequency; differing degrees of documentation; unclear reporting requirements; and lack of tracking, trending, and root cause analysis. While abnormal event reporting required by DOE 5000.3A is tracked, there is no formal trending, root cause analysis, or lessons-learned activities associated with this reporting. It was also found that the Completion Certificates for closure of appraisal findings do not always contain documentation identifying the corrective actions taken. To ascertain the minimum amount of information needed to complete the Certificate, an approving official would have to review the relevant Action Plan, status reports of the actual actions taken, and documentation of the verification of closure. However, none of this information is supplied with the Certificate prior to approval. A process developed for tracking and closing Tiger Team findings appears to more nearly meet the requirements of an effective closure process. KAO has prescribed a quarterly ES&H status report format for SNL, Albuquerque, use that is not as effective a management tool as it could be, since it does not provide variance type reporting nor can one readily determine progress during the reporting period by reading the report.

Self-Assessment

The AL "Self-Assessment Report" partially addressed this finding. It identified the surveillance deficiencies and partially identified the closure of appraisal action items.

Finding MF-14: Roles, Responsibilities and Authorities of AL and KAO

Individual ES&H roles, responsibilities, and authorities of AL and KAO are not clearly defined, communicated to, or understood by the KAO staff.

Discussion

The Manager of AL is responsible and accountable for all ES&H activities within AL and its government-owned facilities operated by AL's Management and Operations contractors including SNL, Albuquerque. An AL document, "Environment, Safety and Health Responsibilities within the Albuquerque Operations Office," dated April 15, 1991, and approved by the Manager, AL, notes that "...This responsibility is exercised through on-site Area Offices which report to the AL Manager and provide direct oversight of contractor operations, and through AL staff responsible for supporting the AL Manager and the Area Offices."

The Area Office Managers, the AL Manager's direct representatives at each facility, are considered line managers. Area Offices are to provide management and direct oversight of contractor operations through onsite monitoring and surveillance of contractor operations. There are multiple indications that ES&H responsibilities are not fully understood by KAO staff. This has been a long-standing situation which may be corrected by the delineation of ES&H responsibilities noted in the April 15, 1991, AL document. However, the responsibilities defined in this document do not appear to provide KAO sufficient authority to assure effective implementation, possibly because "responsibility" has been used synonymously with "authority" in the document. The April 15, 1991, document needs to be clarified to resolve the confusion on exact roles and responsibilities within KAO.

In addition, the stop work authority of KAO and AL staff has not been formally communicated to the staff. (See Concerns OA.1-6, OA.1-7 in Section 4.5.) An interview with a high level AL manager revealed that the AL facilities staff would have to utilize appropriate SNL, Albuquerque, staff in order to stop work on construction subcontracts in the case where imminent danger was observed.

Matrices of roles and responsibilities for the Area Offices are included in "The Roles of the Area Office in the Albuquerque Operations Complex," dated March 1989. The basic premise of these matrices is that there are five degrees of Area Office responsibility for each of 62 functional areas assigned to the seven Area Offices. While the matrix of offices and functions has been filled with numbers corresponding to the degree of responsibility, the application of this matrix to constantly changing internal and external environments is difficult, except for all but the most routine decision. The matrix shows that the arrangement of each Area Office's "line management" responsibility varies with each Area Office.

This confusion is exemplified in KAO's relationship to the Central Training Academy (CTA). The roles and responsibilities of KAO, as outlined in AL 1120, for activities at the CTA are not well-defined. The CTA receives day-to-day direction from the Assistant Manager of Safeguards and Security, in AL, and policy direction from the Office of Safeguards and Security at DOE Headquarters. Funding for the CTA comes from Defense Programs.

Self-Assessment

The AL "Self-Assessment Report" noted that "roles, responsibilities and authorities for AL and area office ES&H and environmental restoration/waste management organizations are not clear, and interfaces not defined well."

FINDING MF-15: AL Management System

AL does not have a process to track and measure cost, schedule, and technical performance for ES&H activities not included in the Environmental Restoration, Waste Management, and Production and Surveillance Programs.

Discussion

One element of program managers' responsibility is the execution of program activities in accordance with all Congressional and DOE financial controls. In addition, a mechanism is necessary to ensure that programs are conducted in order to meet established schedule and cost objectives. Funding for ES&H activities is the largest growth area in the DOE Budget. For SNL, Albuquerque, alone, the ES&H action plan is projected to cost \$475 million through FY 1995. To manage a program this large, a process to plan, authorize, work, establish baselines, approve baseline charges, and monitor activities is essential.

While AL has recognized the need for such a process for Environmental Restoration and Waste Management, and Production and Surveillance Programs, ES&H activities funded by sources other than these programs are not covered by a performance measurement process. For SNL, Albuquerque, \$270 million (57 percent of the total) in the ES&H action plan falls in this category. As a result, without a management system for these activities, there is the potential for anti-deficiency violations, and cost overruns (due to lack of management controls) could jeopardize compliance schedules.

Self-Assessment

AL's "Self-Assessment Report" identified this issue for Environmental Restoration and Waste Management, and Production and Surveillance Programs. ES&H finding included in other programs was not addressed.

FINDING MF-16: AL Review of Proposals for Non-DOE Funded Work and Cooperative Research and Development Agreements

The AL review process for non-DOE funded work proposals prior to submittal to the funding party and for joint work statements for Cooperative Research and Development Agreements (CRADAs) does not assure that ES&H matters are addressed.

Discussion

DOE 4300.2A defines the responsibilities for heads of field elements with respect to non-DOE funded work. At AL, these responsibilities reside with the Operations Office Manager. Effective March 27, 1991, Change 2 to DOE 4300.2A (including a new Attachment 3), makes explicit these responsibilities with respect to ES&H. AL reviews, authorizes, and monitors the non-DOE funded work, and must assure it complies with the "Minimum Standards" detailed in Attachment 3, DOE 4300.2A. DOE's interim guidelines for CRADAs requires that AL consider ES&H matters as part of its review.

Attachment 3 to DOE 4300.2A requires that SNL, Albuquerque, include a statement dealing with ES&H issues in its non-DOE funded proposals to DOE. The DOE approving official is required to make a "determination that the National Environmental Policy Act and other environment, safety and health requirements have been adequately considered in proposed project planning."

The current proposal form submitted by SNL, Albuquerque, to AL identifies only environmental concerns. This is not in conformance with the new requirements of Attachment 3 to DOE 4300.2A.

AL does not require a review by ES&H professionals of SNL, Albuquerque, proposals for non-DOE funded work or for joint work statements for CRADAs. For non-DOE funded work, review is conducted by the AL Reimbursable and Energy Technology Division where the reviewers, who are trained technical scientific staff but not ES&H professionals, have been given environmental training but no safety and health training. For CRADAs, review is conducted by the AL Technology Transfer Branch where the reviewers have not been given any ES&H training.

Self-Assessment

This issue was not identified in the AL Self-Assessment Report.

FINDING MF-17: ES&H Responsibility for DOE Activities Performed on Non-DOE Land

AL has not formulated written procedures to cover the ES&H responsibilities and management of DOE use of non-DOE land at the Kirtland Air Force Base, including assurance that in the event of future cleanup requirements, funding and project management is assigned to a program office.

Discussion

Much of the land at the Kirtland Air Force Base (KAFB) on which SNL, Albuquerque, activities take place is owned by DOE. The Air Force owns most of the remainder of the land, located principally at the western end of the base. The Forest Service owns land at the eastern end of the base which has been withdrawn from public use for use by both DOE and the Air Force. SNL, Albuquerque, has conducted in the past, and continues to conduct, significant activities on parcels of land at KAFB which are not owned by DOE.

For many years, the Air Force has, by use of permits (sometimes referred to as "ingrants"), given DOE the exclusive right to use Air Force-owned areas. These permits generally run for fixed 5-year terms and generally are renewed

periodically, although several parcels of land previously under permit to DOE have been returned to the Air Force. DOE has also been granted a Congressional land withdrawal to use exclusively Forest Service-controlled land. Furthermore, DOE uses Forest Service land, withdrawn from the public domain for Air Force use, and subsequently permitted by the Air Force to DOE. In some instances, DOE and the Air Force use land and buildings jointly.

KAO has the responsibility for keeping track of this history of land arrangements which is decades old. However, there is an absence of written policies, procedures and guidelines at AL and KAO concerning the ES&H responsibilities and management of DOE use of non-DOE land, buildings and facilities. There has been no attempt to allocate such responsibilities and the potential liabilities among the various program offices who have provided support for past and current activities. DOE and the other Federal agencies at KAFB have merely relied upon language, contained in the permit and ingrant documents, which generally states that the permittee shall use the premises in a manner approved by the permitor, and upon return shall restore the premises as required by the permitor. Clearly, this leaves such matters as environmental liability to the interpretation of the parties.

KAO has produced a Use Permit File Index, which it periodically reviews for completeness and accuracy. However, the index does not provide any indication as to the ES&H responsibilities of the respective parties, particularly as to conditions preexisting the DOE use. Where responsibility for preexisting conditions is at issue, the mutual undertakings of the parties could become important. With respect to Superfund liability, for example, the generator, operator and owner are all potentially liable for cleanup. In a hypothetical case, the Forest Service could be the owner, the Air Force the generator, and SNL, Albuquerque/DOE the operator, and the liability would be joint and several. The use permits do not generally address this issue. KAO plans to address the issue in the future as each permit is renewed. However, there is no definitive strategy. It is unclear what guidance has been, or will be, given to KAO regarding such matters as the applicability of NEPA and CERCLA to these arrangements. The prime contract between AT&T and DOE does not expressly cover this issue.

Although KAO considers itself to be charged with the responsibilities of the Real Estate and Real Property Management Function, as outlined in AL 1120, dated January 17, 1991, including the responsibility to manage land use permits and other land arrangements, the authority to approve real estate documents remains with AL. A revision of DOE 4300.1B is anticipated that will allow delegation of approval authority to individuals who have completed a specific course of study. KAO plans to obtain such authority.

Self-Assessment

This issue was not addressed in the AL "Self-Assessment Report."

Finding MF-18: Independent ES&H Oversight of Sensitive Compartmented Information Facilities

Independent ES&H oversight of activities performed at some Sensitive Compartmented Information Facilities (SCIFs) in Bldg. 868 cannot be conducted because AL and SNL, Albuquerque, ES&H professionals do not have the required special access authorizations.

Discussion

There are a number of SCIFs at SNL, Albuquerque. All but one of the SCIFs are subject to independent ES&H oversight. Due to the sensitive nature of the project in this particular SCIF, exclusion areas within Bldg. 868 do not receive independent ES&H oversight. No ES&H professionals from the Tiger Team, AL, SNL, Albuquerque, or any other organization are allowed to conduct inspections. The decision to deny access was made by the Director, Office of Intelligence, DOE, and presumably was made because of the extremely sensitive nature of the project. The Under Secretary has been informed of the decision to deny the Tiger Team access to the exclusion areas of Bldg. 868.

Except for the SCIF in Bldg. 868, the machine shop, chemical storage area, and chemical laboratory were all available for inspection and were visited by the Tiger Team. The Tiger Team was informed by SNL, Albuquerque, and DOE personnel associated with the operations in the exclusion areas of Bldg. 868 that a hoist and a laboratory that stores small quantities of laboratory and commercial chemicals and equipment were part of the operations. These operations would normally warrant Tiger Team assessment.

Prior to this Tiger Team assessment, ES&H self-assessment inspections were conducted in Bldg. 868 in October 1989 and November 1990. No independent ES&H professionals were allowed access to the SCIF for either inspection. SNL, Albuquerque, staff conducted the October 1989 self-assessment inspection, including a self-assessment by cleared staff in the exclusion areas. Overall, 313 findings were identified in Bldg. 868, of which 21 were associated with SCIF operations. All findings from the 1989 self-assessment have since been corrected, according to SNL, Albuquerque.

The November 1990 self-assessment was conducted by ICF Kaiser Engineering ES&H-trained professionals who trained Organization 9110 personnel in preparation for the second self-assessment in the secure areas (similar to the Sandia Jump-Start process). Eleven Safety and Health findings were identified for the areas which have since been corrected; however, there was no independent assessment or validation of these corrective actions.

At present, oversight of the exclusion areas is primarily accomplished by three appropriately cleared SNL, Albuquerque, staff (a Department ES&H coordinator, an environmental and chemical specialist, and a safety specialist). The environmental/chemical specialist works in the exclusion areas. The environmental/chemical and safety personnel received two weeks training by the ICF Kaiser professionals in preparation for the November 1990 self-assessment. Besides the daily oversight by the individual working in the areas, the Division Supervisor's mandatory quarterly inspections are conducted. In addition, AL has one individual who has access to, and who periodically visits the SCIF; however, that individual is trained in intelligence and security activities rather than ES&H disciplines.

Due to the sensitive nature of the activities in these areas, the Tiger Team was denied access and had to rely on interviews with a limited number of cleared staff who are not ES&H professionals. Other sources of information (a few photographs of some of the operations, general documents, and self-assessment reports) were not comprehensive and could not be used by the Tiger Team to properly evaluate ES&H performance.

Because of the lack of access by AL and SNL, Albuquerque, ES&H professionals, no conclusion can be drawn about the degree of safety or environmental compliance with which the conduct of operations is executed in the SCIF area.

An essential element of DOE's ES&H requirements is independent oversight by ES&H professionals from within the contractor's organization and within DOE. Independent oversight means oversight by persons not a part of the line organization performing the activity being reviewed. It is the opinion of the Tiger Team that all DOE operations require independent ES&H inspections, including SCIFs. The risk to health, safety, or the environment associated with the failure to provide independent oversight is considered no less important than maintaining national security. In fact, activities (including oversight) designed to reduce both ES&H and national security risks are complementary and mutually supportive.

6.0

**Evaluation of SNL, Albuquerque and
AL Self-Assessment Reports and Programs**

6.0 EVALUATION OF SNL, ALBUQUERQUE AND AL SELF-ASSESSMENT REPORTS AND PROGRAMS

6.1 TIGER TEAM METHODOLOGY

In order to facilitate the implementation of the Secretary of Energy's directive that Tiger Teams evaluate DOE and facility self-assessment reports and programs, the Tiger Team Leader established a Self-Assessment Task Group, comprised of representatives from each of the three subteams, to complete the evaluation. The Task Group developed the following approach:

- For the purposes of this evaluation, the self-assessment reports to be reviewed consisted of:
 - For SNL, Albuquerque, the "Pre-Tiger Team Self-Assessment Report," (SAND90-2827) dated January 1991, together with the SNL, Albuquerque, "ES&H Action Plan," (SAND91-0942) dated April 1991
 - For AL, the "DOE-AL Self-Assessment Report," dated April 1991
- Each Task Group member was responsible for informing his/her subteam members of the Task Group's objectives and for coordinating the gathering of self-assessment data within his/her subteam.
- A memorandum was sent to every Tiger Team member containing instructions and having forms enclosed to be completed. (See Attachment 1, Memorandum, subject: Evaluation of SNL, Albuquerque, and AL Self-Assessments. A form was provided for each of the self-assessment reports on which Tiger Team personnel were to indicate whether each of the applicable findings or concerns was fully, partially, or not addressed. Tiger Team personnel were also requested to provide comments on the reports.

A week before the closeout, each Tiger Team member completed forms for each finding and identified those addressed in the two self-assessment reports. In addition, a narrative evaluation of the quality of each report was provided, as it related to the Team member's area of expertise. The Task Group reviewed the forms and narratives, and developed composite tables and consolidated narrative evaluations. This information was provided to the Management Subteam who subsequently integrated the various items, developed composite tables, and prepared this section.

In conducting the evaluation of the self-assessment reports, the Management Subteam developed, and was guided by, the Outline of Evaluation Guidance for Self-Assessment Reports. (See Attachment 2.) In conducting the evaluation of self-assessment programs, the Management Subteam was guided by the Secretary's July 31, 1990, memorandum, subject: Guidance on Environment, Safety and Health (ESH) Self-Assessment.

6.2 EVALUATION SUMMARY

6.2.1 SNL, Albuquerque

The Tiger Team reviewed the SNL, Albuquerque, Pre-Tiger Team Self-Assessment Action Plan and their self-assessment program, identifying six findings. The Team also reviewed the AL "Self-Assessment Report" and their self-assessment program. Four findings were identified as a result of this review. (See Table 6-1 for a list of self-assessment findings.)

Overall, the SNL, Albuquerque, "Pre-Tiger Team Self-Assessment Report" reflects a commendable effort at performing a comprehensive self-assessment. It identified many important deficiencies also found by the Tiger Team, and achieved some worthwhile results. It was largely a top-down assessment that considered other inputs that were used as guides, such as results from the 1989 SNL, Albuquerque, ES&H Internal Compliance Assessment; key findings from the "SNL, Livermore, Tiger Team Report;" as well as some interviews, reviews of operating procedures, and selected walkthroughs. This methodology is predominantly a management review of ES&H issues and therefore falls short of the requirements of a fully effective self-assessment program.

The SNL, Albuquerque, ES&H Action Plan covers all of the issues raised in the "Pre-Tiger Team Self-Assessment Report" in thorough detail and provides appropriate action plans with realistic schedules and cost estimates.

Although organizational plans for implementation are in advanced stages of development, the SNL, Albuquerque, program for institutionalizing its self-assessment process is not anticipated to be in place until January 1992.

SNL, Albuquerque, management initiated a series of divisional "Jump Start" self-assessments. These assessments were intended to train line staff in the self-appraisal process on a regular basis and to identify and mitigate ES&H problems. It was a bottom-up assessment by staff at the working level. While "Jump Start" was not considered by the Tiger Team as part of the SNL, Albuquerque, self-assessment, it represented a highly commendable sitewide project to train line staff in self-appraisal techniques, and to instill in the staff a sense of ownership for ES&H compliance. It is anticipated that the best elements of the Pre-Tiger Team Self-Assessment and those of Jump Start will be combined to further develop the ongoing self-assessment process required by DOE.

6.2.2 Albuquerque Field Office

The AL Self-Assessment Report reveals a moderate capability to conduct the kind of self-assessment required by the Secretarial directive. The Report lacks depth and detail, omits significant specific issues, and does not address the SNL, Albuquerque, self-assessment efforts. However, the Report does identify symptomatic weaknesses, findings and preliminary root causes, and includes corrective action plans.

AL's program for institutionalizing its self-assessment process is in the formative stage, and the AL Self-Assessment Report includes an action plan for developing such a program.

TABLE 6-1 - SELF-ASSESSMENT FINDINGS

Finding SAF-1	The SNL, Albuquerque, Self-Assessment Report was not fully comprehensive in scope. It failed to address significant functional safety and health, and environmental areas. Furthermore, in many areas that it covered, the coverage lacked necessary detail.
Finding SAF-2	The SNL, Albuquerque, methodology for conducting the self-assessment was deficient. It predominantly utilized survey questionnaires to reach its conclusions rather than an appropriate mix of questionnaires, documentation review, personal interviews, field observations, inspection, and testing.
Finding SAF-3	The SNL, Albuquerque, personnel conducting the self-assessment lacked independence from the activities they were assessing, and no quality assurance rules were applied to the process.
Finding SAF-4	Although key findings were developed and root cause analysis was performed, the SNL, Albuquerque, Self-Assessment Report did not describe in sufficient detail the process used to arrive at the root causes; nor was the relationship between management systems and practices in place at SNL, Albuquerque, and the ES&H management issues identified in the self-assessment.
Finding SAF-5	Although the SNL, Albuquerque, ES&H Action Plan (Action Plan) is, for the most part, a thorough, comprehensive engineering systems analysis of the entire ES&H effort at SNL, Albuquerque, some areas require greater detail, and the scheduling and sequencing portions can be improved.
Finding SAF-6	The AL self-assessment was limited in scope and depth. It did not address most ES&H functional areas, DOE Headquarters ES&H interactions, site and area office issues, and site contractors' activities. It was largely a management review of AL's ability to manage its ES&H programs.
Finding SAF-7	The AL Self-Assessment Report reveals that root cause analysis was performed, but provides little detail regarding the process.
Finding SAF-8	AL corrective action plans are provided and are generally of good quality with measurable milestones. However, they do not contain cost estimates.
Finding SAF-9	SNL, Albuquerque, has not fully implemented a documented and functioning program to accomplish ongoing, institutionalized self-assessment.
Finding SAF-10	AL has not developed a formal institutionalized self-assessment program. The basic elements of such a program are in the planning stage.

6.3 OVERVIEW OF SELF-ASSESSMENT EFFORTS

6.3.1 SNL Efforts

6.3.1.1 ES&H Internal Compliance Assessment

SNL, Albuquerque, conducted an internal ES&H compliance assessment beginning in October 1989 to assess its compliance status. The former Safety, Health, Environment Appraisal Committee (SHEAC) Council managed the initiative for the SNL, Albuquerque Small Staff (now Management Council). More than 80 appraisal teams, consisting of approximately 400 SNL, Albuquerque, employees and consultants inspected areas at all SNL sites in New Mexico, California, Nevada, Texas and Hawaii.

Excluding the SNL, Livermore, results (which were reported separately), the teams identified nearly 32,000 findings requiring action. Of these, 86 required immediate action to avert threats to personnel or the environment; 23,500 involved noncompliance with laws or regulations; 1,900 were related to DOE Orders; and 6,300 were variations from good business practices.

In 25 instances, operations were suspended or facilities closed. More than 84 percent of the findings were OSHA-related, particularly in the areas of electrical and fire safety. The remainder were related to industrial hygiene (8 percent) and environment (8 percent).

The results of this assessment, including the limited root cause analysis that was performed, were used significantly as input to the "Pre-Tiger Team Self Assessment Report."

6.3.1.2 "Pre-Tiger Team Self-Assessment Report" (Self-Assessment)

The Pre-Tiger Team Self-Assessment (reported in SAND90-2827) was conducted at SNL (Albuquerque, New Mexico; Tonopah, Nevada; and Kauai, Hawaii) from October through December 1990. Areas covered were ES&H (including OSHA), and management practices. The review was conducted by 19 department managers with support from SNL, Albuquerque, ES&H professionals. The assessment focused on the identification of DOE and regulatory ES&H requirements and the determination of the degree of compliance with those requirements as of July 1990.

Initial data were gathered from sitewide responses to over 3,000 performance objective-based surveys called findings input sheets. Findings input sheets were directed to SNL, Albuquerque, managers knowledgeable regarding performance in the pertinent areas. These questionnaires primarily restated DOE Technical Safety Appraisal, DOE Environmental Audit Manual, and DOE Management Appraisal Program performance criteria as questions to which Laboratory personnel were to respond regarding activities in their work areas. The questionnaires covered all aspects of SNL, Albuquerque, activities, and were screened and directed to representative SNL, Albuquerque, managers and executives with responsibility for activities or facilities relevant to the questionnaires. Responses were obtained from members of management at all levels.

Analysis of these responses, in conjunction with limited interviews, selected reviews of operating procedures and documentation, and walkthroughs of

selected facilities, produced 289 significant findings that describe areas in which SNL, Albuquerque, either did not comply with ES&H requirements, or was not using best management practices. These significant findings had a number of commonalities, and they were consolidated into 17 key findings.

An analysis of the 17 key findings by SNL, Albuquerque, led the reviewers to identify the following root causes:

- RC-01 - A general belief exists that "there is no problem."
- RC-02 - Management and staff lack understanding of ES&H rules and regulations, and their applicability to SNL.
- RC-03 - Management and staff believe the ES&H compliance requirements and implementation process are incompatible with the current SNL culture.

The Self-Assessment specifies corrective action requirements for each of these issues, as well as action plan requirements for significant findings identified in the report.

6.3.1.3 SNL ES&H Action Plan (Action Plan)

The SNL "ES&H Action Plan" (SAND91-0942) details all of the planned actions, including the associated resource requirements necessary to achieve ES&H compliance at SNL, Albuquerque, Tonopah Test Range, and Kauai Test Facility. This document addresses the planned actions resulting from and specified in the Self-Assessment, as well as other planned actions deemed necessary to achieve ES&H compliance. In addition, the Action Plan was prepared according to DOE format and content standards for post-Tiger Team assessment action plans and includes the estimated costs associated with achieving and maintaining ES&H compliance.

The Action Plan describes the SNL, Albuquerque, management and organizational structures that will oversee, manage, or implement the planned actions described therein. The Action Plan also includes specific responses and planned actions, summary tables of the planned actions, completion priorities, estimated completion dates, and projected costs.

The costs required to implement the Action Plan were developed for each planned action. Costs were then compiled for each fiscal year and compared with available funds for FYs 1991 and 1992. A process is underway to prioritize planned actions and adjust implementation schedules to match the available budget (load balance) so that the highest priority items are implemented first. This is an ongoing process and subject to a number of factors (e.g., the results of this Tiger Team Assessment). SNL, Albuquerque, intends to fully implement the process before the post-Tiger Team Action Plan is submitted to DOE in July 1991.

The total cost of implementing the Action Plan for FYs 1991 through 1995 is approximately \$475 million. Following the load balance activities described above, SNL, Albuquerque, will commit to fund all actions scheduled for FY 1991. It should be noted that approximately \$336 million will be required to support planned actions for FYs 1993 through 1995. Funding for these actions

and corrective actions for any additional Tiger Team findings will be requested through the normal budgeting process.

6.3.1.4 Self-Assessment Jump Start (Jump Start)

Jump Start was a sitewide project to train line staff in self-appraisal, and to find and mitigate serious hazards. It was a bottom-up assessment by people at the working levels.

Jump Start was a series of self-appraisal training exercises - one for each Vice Presidency (except VP-4000, the legal organization, which occupies only office space). It was a response to concerns from the Sandia, Livermore, Tiger Team Report and the Pre-Tiger Team Self-Assessment. The themes were training and "ownership." The principal objectives of Jump Start were threefold:

- conduct training in self-appraisal,
- conduct a survey for serious ES&H problems, and
- develop a prototype line self-appraisal.

Jump Start also included training for senior managers (directors and above) in conducting walkthroughs of the areas for which they are responsible.

The appraisal teams included union-represented personnel, technicians, staff, and supervisors. Team size was 40 to 45 people for all teams except VP-3000 and VP-5000, where team size was about 20 people each. Each included two or three representatives from KAO. Each was supported by about eight ES&H professionals from ICF Kaiser Engineers, and by representatives from Facilities Engineering (Organization 7800).

Each VP team devoted three weeks, full-time, to the appraisal (plus several weeks part-time) to finish the report. There were separate environmental, and safety and health inspections; thus, two groups visited each building and test site. Each inspection team also performed several procedure walkdowns, either observing actual procedures or walking through them. ICF Kaiser Engineers provided the support that would normally come from SNL ES&H professionals.

The planning for Jump Start was initiated in early December 1990 and continued through January 1991. The training and field inspections occurred throughout February and March 1991.

The Jump Start exercise produced a compilation of inspection deficiencies, and the findings and root causes arising from these deficiencies. It was designed to complement the Pre-Tiger Team Self-Assessment and provide a perspective of the ES&H posture in the organizations under each Vice President. By itself, it did not provide an integrated comprehensive sitewide portrait of ES&H issues to be used as a management tool for decision-making and corrective action planning. The Jump Start teams identified a number of findings and a root cause that were not addressed by the Pre-Tiger Team Self-Assessment. However, Jump Start key findings and root causes were consistent with the Pre-Tiger Team Self-Assessment.

6.3.2 Albuquerque Field Office Efforts

The AL Self-Assessment evaluated the capability of AL to effectively manage ES&H programs. It identified symptomatic weaknesses, combined the weaknesses into findings, derived preliminary root causes, and prepared corrective action plans to address the root causes. The current state of AL's institutional self-assessment program was evaluated by AL against the Secretary's July 31, 1990, guidance for self-assessment activities; and a specific action plan was developed for implementing a formal, institutional self-assessment program at AL.

The AL assessment included information from KAO, which provides daily oversight of SNL, Albuquerque, and reports to the AL Manager.

AL chose not to address the self-assessment activities performed by SNL, Albuquerque, or the institutionalization of the SNL, Albuquerque, self-assessment process, although the Secretarial guidance suggests that this would be appropriate.

The AL Self-Assessment describes the status of AL's management of ES&H as of March 1991. Where initiatives have already been completed or are in progress to improve AL's management of ES&H, they are discussed in the corrective action plans associated with the respective findings, in order to place the findings in context.

The weaknesses identified by AL were grouped into ten categories of findings. Analysis of the weaknesses and findings resulted in the identification of the following "preliminary" root causes:

- Inconsistent or insufficient communication of policy/guidance to area offices and contractors
- Insufficient formality and discipline in day-to-day business (conduct of operations)
- Insufficient resources
- Insufficient training

These were the fundamental deficiencies within AL contributing to the specific weaknesses. The four root causes were described as preliminary, because AL will continue to analyze the findings and the effectiveness of corrective actions in improving performance. Actions will be modified if desired results are not achieved or if additional root causes are found.

6.4 EVALUATION OF THE SNL, ALBUQUERQUE, PRE-TIGER TEAM SELF-ASSESSMENT REPORT AND ACTION PLAN

6.4.1 Summary

The Pre-Tiger Team Self-Assessment (Self-Assessment) is an exercise whose quality and effectiveness was limited by the methodology of its execution. It was conceived as a top-down SNL, Albuquerque, management review that relied

largely upon analysis of the responses to a massive quantity of survey questionnaires, but it also included significant input from previous bottom-up assessments. (See discussion in Section 6.2.1.) The Report addressed, either fully or partially, when compared to the Tiger Team Assessment, 59 percent of the Environmental Subteam findings, 65 percent of the Safety and Health Subteam concerns, and 83 percent of the Management Subteam findings. Table 6-2 provides further data on this comparison. (Further details on individual findings/concerns are provided in Attachment 3.) In addition, all of the basic deficiencies that led to the Category I and II concerns reported by the Safety and Health Subteam were identified in the Self-Assessment.

If findings from the Self Assessment Jump Start Report, provided to the Tiger Team by SNL, Albuquerque, were included in Table 6-2, the results would be more favorable. SNL, Albuquerque, reports that the Jump Start more fully addressed 7 and partially addressed 9 of the Tiger Team findings that were not addressed by the Pre-Tiger Team Self Assessment. However, Jump Start findings were not validated by the Tiger Team and, therefore, were not included. Table 6-2 also does not include 5 Explosive Safety concerns that were fully addressed by SNL Independent Explosives Operations Appraisal Teams as stated in Section 4.5.20. Both the Jump Start and Explosive Operations Appraisal findings were known by SNL, Albuquerque, prior to the Tiger Team Assessment. If these findings were validated and included in Table 6-2, the totals would change to the following:

No. of Findings/Concerns	309
Fully Addressed	142 (46%)
Partially Addressed	78 (25%)
Not Addressed	89 (29%)

The Report is organized and logically presented in a "user-friendly" manner which generally facilitates understanding.

TABLE 6-2
SNL, ALBUQUERQUE PRE-TIGER TEAM SELF-ASSESSMENT FINDINGS/CONCERNS
COMPARISON WITH TIGER TEAM FINDINGS/CONCERNS

TIGER TEAM SUBTEAM	NO. OF FINDINGS/ CONCERNS	NOT ADDRESSED	PARTIALLY ADDRESSED	FULLY ADDRESSED
Environmental:	82	34 (41%)	27 (33%)	21 (26%)
Safety & Health:	215	74 (35%)	35 (16%)	106 (49%)
Management:	12	2 (17%)	7 (58%)	3 (25%)
TOTAL:	309	110 (36%)	69 (22%)	130 (43%)

The "ES&H Action Plan" is, on the whole, a thorough and comprehensive document whose corrective action plans address the specific findings and issues as well as the key findings and root causes. In most instances, there is an understanding of the problem and its requirements. For example, the Environmental Subteam considered that in the area of "quality assurance," the corrective actions proposed and being implemented appeared adequate to rectify the problems, and that the implementation plan was well-defined. Also, the

Action Plan for "inactive waste sites" demonstrated a clear understanding of both statutory and DOE requirements. The schedules are generally realistic, in proper sequence, and include measurable milestones for accomplishment. Cost estimates are realistic and identify funding sources.

6.4.2 Self-Assessment Findings

Finding SAF-1:

The SNL, Albuquerque, Self-Assessment Report was not fully comprehensive in scope. It failed to address significant functional safety and health, and environmental areas. Furthermore, in many areas that it covered, the coverage lacked necessary detail.

Discussion

The scope of the Self-Assessment was not fully comprehensive. Most areas of SNL, Albuquerque, facilities and operations are addressed, and there was broad organizational and individual participation in the execution of the assessment and in the preparation of the report. However, numerous areas were either not addressed at all, or not treated in a manner that demonstrated a full appreciation of the problems. Examples include the following:

- In "explosives safety," where the Safety and Health Subteam had seven concerns, there was no coverage in the Self-Assessment, despite the fact that SNL, Albuquerque has experienced nine reportable occurrences related to explosives operations in the past two years. However, it is noted that an Explosives Safety Assessment conducted at around the same time as the Pre-Tiger Team Self-Assessment, identified all concerns found by the Safety and Health Subteam.
- In "training," one of five concerns identified by the Safety and Health Subteam was addressed, omitting such issues as absence of an implemented training program for radiation protection technicians and storage of training records.
- In "radiation protection," 13 of the 24 concerns identified by the Safety and Health Subteam were fully or partially addressed.
- In "nuclear criticality safety," the discussion in support of the findings provided little guidance as to the precise nature of the problem or how to resolve it. Findings were often very broad: "The SNL nuclear program does not meet all the requirements of DOE Order 5480.5"
- In "worker safety" (OSHA), 29 CFR 1910 and 1926 criteria were not discussed in sufficient depth to assure that comprehensive action plans could be developed to implement applicable requirements of the regulations.
- In "toxic and chemical materials," Federal Insecticide and Rodenticide Act (FIRA) issues were mentioned briefly, but the lack of documentation (such as SOPs for the pesticide and herbicide programs and logs for the application of herbicides by SNL,

Albuquerque, employees) is not addressed. Furthermore, the polychlorinated biphenyl (PCB) inventory and waste program is mentioned, but primarily as a matter to be coordinated between Organizations 3221 and 7810; there was no mention that the pole-mounted transformers are only just now being addressed by this program, and have not been sampled completely nor retrofitted/removed.

Finding SAF-2:

The SNL, Albuquerque, methodology for conducting the Self-Assessment was deficient. It predominantly utilized survey questionnaires to reach its conclusions rather than an appropriate mix of questionnaires, documentation review, personal interviews, field observations, inspection, and testing.

Discussion

The Self-Assessment employed a survey approach based on performance objectives furnished to the respondents to gather relevant data. The survey forms contained many questions which merely required a "yes" or "no" response and, therefore, did not provide enough detail to permit useful interpretation and discussion to be developed. Investigation revealed that this approach occasionally led to misleading results when the respondent did not fully understand the question but answered it anyway. Although there were some clarifying interviews with personnel, some document reviews, and walkthroughs of selected facilities, there was no attempt to apply QA principles of independent verification to the process or to the huge database of information.

The Self-Assessment did not provide adequate detail about the methods utilized by SNL, Albuquerque, to convert the survey data into the broad finding categories, in order to permit an evaluation of these methods.

The Self-Assessment indicated that SNL, Albuquerque, relied extensively on the DOE Environmental Audit Manual as the source for the audit protocol. However, interviews revealed that reliance on the Manual was less than indicated and guidance was obtained from other sources as well. Specific weaknesses associated with reliance upon the Manual include the following:

- The DOE Environmental Audit Manual deals entirely with Federal regulatory requirements and DOE Orders. No state or local requirements are addressed by the Manual. As a result, there were no references in the Self-Assessment to specific state and local laws, regulations, or other requirements.
- The Manual is primarily an audit checklist that takes a symptomatic rather than programmatic approach to evaluating environmental compliance.
- The Manual does not include any revisions to regulatory requirements, or DOE Orders, or any new regulations or Orders, promulgated after October 1989.

Finding SAF-3:

The SNL, Albuquerque, personnel conducting the Self-Assessment lacked independence from the activities they were assessing, and no quality assurance rules were applied to the process.

Discussion

The Self-Assessment process was performed under the direction of a working group of 19 department managers which constituted a fairly accurate cross-section of SNL, Albuquerque. This group received a one-week self-assessment training course based upon techniques used by the Institute of Nuclear Power Operations, and reviewed pertinent guidance documentation. Although there was some reliance upon outside expertise, the process was not unduly dependent upon such expertise. Management senior to the working group was involved in all stages of the process and support was received from the highest levels of SNL, Albuquerque, management.

However, since for the most part, the information was gathered by those persons who were responsible for the activities they were assessing, and no QA verification principles were applied to the process, the assessment results lack the necessary element of independence. Nor was this deficiency cured by the fact that self-assessment data were collected, sorted, and analyzed by "independent" persons, since the analysis can only be as credible as the information analyzed.

Finding SAF-4:

Although key findings were developed and root cause analysis was performed, the SNL, Albuquerque, Self-Assessment Report did not describe in sufficient detail the process used to arrive at the root causes; nor was the relationship between management systems and practices in place at SNL, Albuquerque, and the ES&H management issues identified in the Self-Assessment.

Discussion

A systematic identification of key findings and root causes is essential to any successful and sustainable self-assessment process, and is vital input for management decision-making. For the most part, the process described in the Report appears to lack the necessary structure and methodology. Tiger Team interviews revealed that the process was extensive and far-reaching, yet the Report describes no other process than "an exhaustive asking of 'Why?'" Furthermore, the Report provides no logic trail leading from findings to the key findings to the root causes, thereby forcing the reader to either accept the analysis on faith or to examine all sections of the Report to establish and verify the connections.

Root Cause R1 deals with employees' beliefs and perceptions, yet the respective Action Plan Requirement, APR-RC-01, speaks only of analyzing data, continuing self-assessments and increasing management awareness, rather than of effective leadership, education and dissemination of new ideas. The Action Plan response is only minimally better in addressing the issues embodied in resolving this root cause. It references an ES&H Employee Communications Program and refers the reader to an action plan, AP-M10D-01, which, however, states that it relates to Root Cause R2.

Root Cause R2, which deals with lack of understanding of ES&H rules and regulations, is to be resolved mainly by training and procedural implementation. There is no mention therein of setting specific organizational and individual ES&H goals and objectives.

Root Cause R3, essentially a "culture" discussion, is well presented and its corresponding action plan appropriately calls for more effective leadership, communication and line management involvement.

Finding SAF-5:

Although the SNL, Albuquerque, ES&H Action Plan (Action Plan) is, for the most part, a thorough, comprehensive, engineering systems analysis of the entire ES&H effort at SNL, Albuquerque, some areas require greater detail, and the scheduling and sequencing portions can be improved.

Discussion

The Action Plan is a thorough, comprehensive document. All of the 289 significant findings, 17 key findings, and 3 root causes are addressed with responses, planned actions, schedules for accomplishment, and projected costs. It is characterized as a "living document," which will be revised to incorporate the responses to the Tiger Team's findings and concerns. It is logically presented, although Section 3 is lengthy, containing responses and planned actions, and an index of its contents would be helpful. The following deficiencies were noted:

- In "auxiliary systems," the response is too general and essentially reiterates the findings; the planned actions are fragmented and incomplete.
- In some instances, the schedule for accomplishment of a planned action does not appear to reflect a sufficient sense of urgency (e.g., staffing and training of Organization 3201 will not be completed until September 30, 1992). Since so many of the other planned actions will depend upon a fully functioning ES&H professional organization, this item should have a higher priority. Similarly, it will not be before September 30, 1992, that the charters, staffing and initial training for Divisions 7301 and 7312 will be accomplished.
- In "surface water," the organizational responsibility and authority as well as the funding, training, procedures, and management of this area are unclear. The assignment of responsibility is of particular interest in the area of "toxic and chemical materials," since the management of their acquisition, use, storage, and disposal cuts across so many lines of responsibility and authority.
- Interviews with SNL, Albuquerque, personnel, and review of prior programs and documentation revealed that in "surface water," the resources and timeframes to accomplish the activities appear to be optimistic.

- In "air quality," while resources, personnel and schedule have been addressed, they are not adequate and lack the necessary detail to support the proposed budget and schedule. The six months allocated for full implementation of the meteorological monitoring program does not appear feasible.
- In "inactive waste sites," the Action Plan briefly describes a risk assessment to be conducted for each environmental restoration (ER) site, but it only takes carcinogenic activity into account, and does not address non-carcinogenic risks. Furthermore, the schedule states that by FY 2001, risk assessments will be completed for each ER site. Given the current lack of quantitative data for all ER sites, there is little evidence that SNL, Albuquerque, will be able to complete adequate and appropriate risk assessments for all ER sites within the next 10 years.
- Even though the Action Plan is quite detailed, it is not easy to determine when some significant events, such as the full range of required independent appraisals, will begin.

6.5 EVALUATION OF ALBUQUERQUE Field Office SELF-ASSESSMENT REPORT

6.5.1 Summary

The AL Self-Assessment Report is not comprehensive in scope and is essentially a management review. It did not address ES&H functional areas, did not specifically evaluate the contractors' activities, and did not fully address AL's ES&H relationship with DOE Headquarters. It did, however, identify a range of symptomatic weakness, combine these weaknesses into findings, and identify preliminary root causes.

The corrective action plans were generally well done, but in some instances, they lacked detail. Cost estimates were not provided.

As is indicated in Table 6-3, the Report addressed, either fully or partially, 67 percent of the Environmental Subteam findings, 35 percent of the Safety and Health Subteam concerns, and 43 percent of the Management Subteam findings identified during the Tiger Team Assessment. Further details on individual findings/concerns are provided in Attachment 4.

**TABLE 6-3
AL SELF-ASSESSMENT FINDINGS/CONCERNS COMPARISON
WITH TIGER TEAM FINDINGS/CONCERNS**

TIGER TEAM SUBTEAM	NO. OF FINDINGS/ CONCERNS	NOT ADDRESSED	PARTIALLY ADDRESSED	FULLY ADDRESSED
Environmental: *	6	2 (33%)	4 (67%)	0
Safety & Health:	26	17 (65%)	2 (8%)	7 (27%)
Management:	7	4 (57%)	2 (29%)	1 (14%)

TIGER TEAM SUBTEAM	NO. OF FINDINGS/ CONCERNS	NOT ADDRESSED	PARTIALLY ADDRESSED	FULLY ADDRESSED
TOTAL:	39	23 (59%)	8 (20%)	8 (21%)

* All of the Environmental findings relate to NEPA activities.

6.5.2 Albuquerque Field Office Self-Assessment Findings

Finding SAF-6:

The AL Self-Assessment was limited in scope and depth. It did not address most ES&H functional areas, DOE Headquarters ES&H interactions, and site contractors' activities. It was largely a management review of AL's ability to manage its ES&H programs.

Discussion

The AL Self-Assessment Report lacks scope and depth and was largely a management review. Most ES&H functional areas were not addressed. As a result, for example, it addressed, fully or partially, only 41 percent of the concerns identified by the Tiger Team Assessment. Furthermore, in the NEPA area, it failed to address NEPA authority for NEPA determinations and KAO NEPA reviews.

AL chose not to relate the Report's nine categories of findings to the findings of the SNL, Albuquerque, Pre-Tiger Team Self-Assessment Report, and not to evaluate the effectiveness of efforts by SNL, Albuquerque, to establish an institutionalized self-assessment program. This approach is not consistent with the Secretarial guidance.

The Report did not examine the role that DOE Headquarters plays in AL's ability to manage its ES&H programs, although the need for memoranda of understanding with Program Senior Officials is recognized in the Corrective Action Plan Section.

KAO conducted a self-assessment as an assessment subteam, and the results have been incorporated into the findings and corrective action plans in the Report.

Finding SAF-7:

The AL Self-Assessment Report reveals that root cause analysis was performed, but provides little detail regarding the process.

Discussion

AL performed root cause analysis using the Management Oversight and Risk Tree (MORT) methodology and derived four root causes. Little detail is offered in the Report to describe the causal factors considered and the path taken to the root causes from the findings.

Finding SAF-8:

AL corrective action plans are provided and are generally of good quality with measurable milestones; however, they do not contain cost estimates.

Discussion

The corrective action plan Section of the Report is well done, although in some instances the action plans lack sufficient detail. Cost estimates for accomplishment of planned actions are not included.

6.6 EVALUATION OF SNL, ALBUQUERQUE, SELF-ASSESSMENT PROGRAM

6.6.1 Summary

SNL, Albuquerque, does not have a functioning self-assessment program that has assigned responsibilities, defined scope and schedule, standard operating procedures for conducting assessments, and systems for collecting, trending findings and tracking them to the closure of corrective actions. There are many elements of a good program in varying stages of development. The SNL, Albuquerque, self-assessment implementation plan has been approved by AL. While it provides for the ES&H Regulatory Assessments Division, Organization 3201, to be responsible for implementing the plan, it is difficult to understand how all of the organizational elements involved will ultimately fit together.

The Pre-Tiger Team Self-Assessment has been described by SNL, Albuquerque, as "the first phase" in the implementation of a self-assessment program, and further that the ES&H responsibilities matrix and checklists used in that assessment are the "starting point" for development of an ongoing process. SNL, Albuquerque, management recognizes that the Pre-Tiger Team Self-Assessment is not the model for the ongoing program. While SNL, Albuquerque, takes pride in the Self-Assessment Jump Start, it concedes that the exercise did not, by itself, provide a sitewide perspective of ES&H status. Combining the best elements of the Pre-Tiger Team Self-Assessment, those of the SNL Self-Assessment Program (PG470093, approved but not implemented), and those of the Jump Start; and fully integrating those elements across the organization, will lay the foundation for the institutionalized self-assessment process required by DOE.

6.6.2 Self-Assessment Findings

Finding SAF-9:

SNL, Albuquerque, has not fully implemented a documented and functioning program to accomplish ongoing, institutionalized self-assessments.

Discussion

The SNL, Albuquerque, program for institutionalized self-assessment is incomplete. Numerous elements of such a program are in varying stages of formulation. For example, there are several tracking systems and databases that are likely candidates for inclusion in the program. One of these is the

Sandia Issues Management System, but organizational responsibility for the system and its specific role in the program are unclear.

6.7 EVALUATION OF ALBUQUERQUE Field Office SELF-ASSESSMENT PROGRAM

6.7.1 Summary

There is a recognition in the AL Self-Assessment Report that AL lacks a formal and disciplined process for conducting self-assessments, and that there is no formal AL policy to formulate and implement a self-assessment program. The AL organization that will have responsibility for the self-assessment program has not been identified. Thus far, there is only a plan to "form a steering committee" to identify the responsible organization and the staffing requirements to support the program.

It is recognized that the AL self-assessment program will require the approval of Defense Programs (DP), and therefore, will be developed in the light of guidance from that Office. To date, guidance has not been provided by DP, although a description of the DP self-assessment policy and process is anticipated in the near future.

6.7.2 Self-Assessment Findings

Finding SAF-10:

AL has not developed a formal institutionalized self-assessment program. The basic elements of such a program are in the planning stage.

Discussion

Although AL does not have in place a formal, institutionalized self-assessment program, it has some of the elements necessary for such a program. These include ES&H appraisals, a Management Review Division responsible for evaluating AL organizations, and an ES&H action tracking system. However, some of the basic elements necessary for such a program are lacking. Most important, there is a lack of "ownership" of the entire program, and no one organizational element has been assigned the overall responsibility. The absence of fixed and clear responsibility, and of formal policies, processes and procedures to formulate, direct and implement a self-assessment program, suggest that AL is in the formative stages of such a program.

The corrective action plan for the AL Institutional Self-Assessment Program, contained in the AL Self-Assessment Report, establishes a reasonable path to accomplishment, but its pace will depend significantly upon DP involvement, guidance and approval.

ATTACHMENT 1

Memorandum, Self-Assessment Task Group/All Members of Tiger Subteam

ATTACHMENT 1

Instructions to Tiger Team Members for collecting Self-Assessment information.

TO: All Members of Tiger Team Subteams
FROM: Self-Assessment Task Group
SUBJECT: Evaluation of SNL, Albuquerque, and AL Self-Assessments

In order to implement the Tiger Team requirement to evaluate the effectiveness of the SNL, Albuquerque, and the AL self-assessments, and of the self-assessment processes at those organizations, Mr. David Spence, Tiger Team Leader, has established the following task group:

<u>Subteam</u>	<u>Representative</u>
Environmental	M. Jones
Management	M. Laster/D. Mershon
Safety & Health	L. Brinkerhoff

Each Tiger Team Member should provide the following information to his/her subteam representative. Forms are attached to assist in organizing the information.

1. An indication as to whether each identified finding (for the Environmental and Management Subteams) and concern (for the Safety and Health Subteam) was fully, partially, or not addressed in the respective self-assessments. For the purposes of this exercise, self-assessments shall consist of the following:
 1. SNL, Albuquerque, Pre-Tiger Team Self-Assessment, (SAND90-2827) dated January 1991
 2. SNL, Albuquerque, Action Plan, dated April 1991
 3. DOE-AL Self-Assessment Report, dated April 1991.
2. Use Part I of the attached Form to report whether each self-assessment: (a) did not address; (b) partially addressed; or (c) fully addressed your finding/concern. (For each finding/concern, provide a number, type (where appropriate), and title or description, and then place a check in the appropriate box for each self-assessment. Use as many forms as necessary to account for all findings/concerns in your area of expertise.

The forms (part 1 and part 2) can be retrieved on all Tiger Team computers.

- Go into "O" File Copy Option on main menu
- Copy file FROM Common area to: "M" Personal WP
- When filename appears type "SELFAS"
- Form will not be on your hard drive under "SELFAS"

If you need help in copying the form to your hard drive, please contact Denise Mershon, Rm 61, Word Processing, or Computer support.

3. Provide your narrative evaluation of the quality of each of the self-assessments, as it relates to your area of expertise, in accordance with the guidance in Part 2 of the attached Form.

SANDIA SELF-ASSESSMENT EVALUATION FORM Part 2

Please prepare a **brief** overall evaluation of the quality of the self-assessment in the area of your expertise. Your narrative should answer at least the following questions:

- (a) To what extent was the area covered in the report, e.g., clarity, comprehensiveness, adequacy of documentation.
- (b) Is there evidence that the findings/concerns were analyzed for causal factors, root causes, etc?
- (c) What is the adequacy of the proposed corrective action(s), e.g., does the response show an understanding of the problem and its requirements; will the proposed action eliminate the problem; and reasonable milestones and resource allocations included?

ATTACHMENT 2

Outline of Evaluation Guidance for Self-Assessment Reports

ATTACHMENT 2

OUTLINE OF EVALUATION GUIDANCE FOR SELF-ASSESSMENT REPORT

- 1. The scope of the report is comprehensive.**
 - all ES&H functional areas and management issues are fully addressed
 - all facilities, buildings, sites and ES&H activities are covered
 - As a minimum, the "Areas of Inquiry" in the July 31, 1990, Secretary of Energy memo are addressed
 - In the case of DOE, the report covers Headquarters, the Field Office, the Site(s) or Area Office(s), the site contractor's activities, and the site contractor's self-assessment report.
 - There is broad organizational and individual participation in the execution of the assessment and in the preparation of the Report
- 2. The assessment methodology includes an appropriate mix of:**
 - survey questionnaires
 - documentation review
 - personal interviews
 - field observations
 - inspection and testing
- 3. The assessment was conducted by qualified people.**
 - knowledgeable line management personnel performed assessments of their activities
 - independent internal assessments were performed by personnel who were not directly responsible for the activities being assessed
 - Assessments were not dominated by, or unduly dependent upon, outside consultants expertise
- 4. Senior management of the organization was involved in all stages of the assessment and in the preparation of the report.**
- 5. The assessment results have been integrated on an organizationwide basis.**
 - In the case of DOE, results regarding Headquarters, the Field Office, and Site Area Office have been integrated.
- 6. Management findings and issues are derived from, and grounded in, functional appraisal findings.**

7. Key findings are identified.

- key findings are not merely reiterations of the most important assessment findings
- key findings address problems common to aggregates of assessment findings and capture the substance of these findings

8. Root cause analysis has been performed.

- Each root cause is the most basic cause of the associated finding or group of findings (e.g., key findings) which, when eliminated or compensated for, will prevent recurrence.

9. The report embodies effective corrective action plans.

- Corrective action plans address all specific findings and issues
- Corrective action plans address all root causes
- In each instance, there is a full understanding of the problem and its requirement
- Schedules are realistic, appropriately phased and sequenced, and include measurable milestones for accomplishment
- Cost estimates are reasonable and identify realistic funding sources

10. Both good performance as well as deficient performance are noted.

11. The report exhibits candor, openness and foresight.

12. The report is organized and presented in a "user-friendly" manner to facilitate understanding.

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ATTACHMENT 3

Composite SNL Self-Assessment Chart

SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

Subteam:			Name:				
Area of Expertise: Air							
Finding/ Concern Number	Finding Type- CF or BMPF	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION	Not Addressed			
A/CF-1	CF		Inventory, Characterization, and Registration of Air Emission Source			X	
A/CF-2	CF		Air Pollution Control Equipment			X	
A/CF-3	CF		Stack Monitoring		X		
A/CF-4	CF		NESHAP for Radionuclides from DOE Facilities		X		
A/CF-5	CF		Ambient Air Quality Surveillance Network			X	
A/CF-6	CF		Meterological Programs			X	
A/CF-7	CF		Gasoline delivery to Technical Area III and Coyote Test Field Gasoline Tanks	X			
A/CF-8	CF		Permitting Soil Disturbance at Construction Projects	X			
A/CF-9	CF		Permits for Open Burn at SNL	X			
A/CF-10	CF		Emergency Power Generators in Building 862	X			
A/BMPF-1	BMPF		Uncontrolled Emissions	X			

SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

[illegible]

SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

[illegible]

SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

Subteam: Environmental			Name:				
Area of Expertise:			Waste Management				
Finding/ Concern Number	Finding Type- CF or BMPF	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION				
WM/CF-1	CF		Sanitary and Non-Hazardous Waste			X	
WM/CF-2	CF		Used Lead Program		X		
WM/CF-3	CF		Waste Characterization		X		
WM/CF-4	CF		Mixed Waste Characterization			X	
WM/CF-5	CF		Mixed Waste Storage			X	
WM/CF-6	CF		Mixed Waste Inventory				X
WM/CF-7	CF		Hazardous Waste Management Fac.		X		
WM/CF-8	CF		Satellite Accumulation		X		
WM/CF-9	CF		Classified Waste				X
WM/CF-10	CF		Classified Waste Landfill		X		
WM/CF-11	CF		Hazardous Waste Training for Generators		X		
WM/CF-12	CF		Hazardous Waste Thermal Treatment Unit		X		
WM/CF-13	CF		Waste Minimization Program				X
WM/CF-14	CF		Hazardous Waste Manifests		X		
WM/CF-15	CF		Underground Storage Tank Program		X		
WM/CF-16	CF		Transuranic Waste			X	
WM/CF-17	CF		Low-Level Waste Performance Assessment		X		
WM/CF-18	CF		Radioactive Waste Volume Reduction			X	
WM/CF-19	CF		Low-Level Waste Characterization				X

SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

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SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

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SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

[illegible]

SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

Subteam: Environmental			Name:			
Area of Expertise:			Radiation			
Finding/ Concern Number	Finding Type- CF or BMPF	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
R/CF-1	CF		Radiological Effluent Monitoring		X	
R/CF-2	CF		Certification of Compliance with DOE 5400.5	X		
R/CF-3	CF		Liquid Discharges to Previously Contaminated Areas			X
R/CF-4	CF		Release of Radioactively Contaminated Real Property			X
R/CF-5	CF		Environmental Monitoring Plan			X
R/CF-6	CF		Environmental Contamination Control		X	
R/CF-7	CF		Annual Radiological Monitoring Report		X	
R/CF-8	CF		Outside Storage of Contaminated Material	X		
R/CF-9	CF		Post Accident Radiological Environmental Surveillance & Dose Assessment	X		
R/CF-10	CF		Radioactive Effluent/Onsite Discharge Reports		X	
R/CF-11	CF		Environmental Aspects of Safety Analysis		X	
R/CF-12	CF		Environmental Review of Operational and Facility Changes	X		
R/CF-13	CF		Decontaminated and Decommissioning Program		X	
R/CF-14	CF		Control of Radioactively Contaminated Personal Property		X	
R/CF-15	CF		Incorporating Environmental Design Criteria into New Facilities and Mods	X		

SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

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SANDIA SELF-ASSESSMENT EVALUATION FORM Part I

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PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Brinkerhoff						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
OA.1-4	H2/C1		Lack of Job Description			x
OA.1-5	H2/C2		Safety Meeting	x		
OA.2-1	H2/C2		Assigned Space Responsibility & Authority	x		
OA.2-2	H2/C1		Lack of Self-Assessment & Independent App. Programs			x
OA.3-1	H3/C1		Lack of Goals			x
OA.4-4	H2/C2		Lack of Corp. Oversight	x		
OA.5-1	H2/C2		Plotting & Trending Performance Indicators		x	
OA.5-2	H2/C1		Management Presence in Workplace		x	
OA.6-2	H2/C2		Lack of Safety in Performance Eval.		x	
OA.7-2	H2/C1		Control of Controlled Documents		x	
OA.7-3	H2/C1		Records Storage		x	
OA.8-1	H2/C2		Substance Abuse			x

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Himpler						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
QV.1-1	H2/C2		SNL - Qual. programs not established			x
QV.1-2	H2/C1		SNL - QA training requirement no defined		x	
QV.1-3	H3/C1		SNL - audits program not effective			x
QV.1-2	H2/C1		SNL - Procure. documentation has no independent verification			x
QV.3-1	H2/C1		No guidance, etc. for SNL receiving & preinstallation insp.		x	
QV.4-1	H2/C2		Cal. programs not implemented		x	
QV.5-1	H2/C1		No program for identification & control for hardware/material	x		
QV.6-1	H2/C1		Inspection programs do not meet requirements		x	
QV.7-1	H2/C2		No programs for control of special processes			x

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Peterson/Van Witbeck			Page 1 of 2			
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
OP.1-1	3/1		Goals & Indicators	x		
OP.1-2	3/2		Clear Delineation of Lines of Authority			x
OP.1-3	3/2		Responsibilities/Definition			x
OP.1-4	1/4		Effective Reading Program		x	
OP.2-2	2/2		Policy & Procedure for Operating Logs			x
OP.3-8	2/1		Configuration Control			x
OP.3-9	2/1		Policy for Operating Procedures			x
OP.3-10	3/1		Use & Control of Operator Aides			x
OP.4-1	2/1		ID Tagging, Logging Equipment			x
OP.4-2	1/1		Lockout/Tagout			x
OP.4-3	2/1		Changes to OP's prior to Required Implementation Date			x
OP.4-4	2/1		Training for New Procedures, Manuals			x
OP.5-1	2/1		Housekeeping			x
OP.6-1	3/2		Operating Modes	x		
OP.6-2	3/1		Job Specific Training			x

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

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PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Masson			Page 1 of 2			
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
MA.1-1	H2/C1		No formal maintenance program			x
MA.1-2	H2/C1		Org. structure not defined			x
MA.1-3	H2/C1		Graded approach not used			x
MA.1-4	H2/C1		Resources not allocated			x
MA.1-5	H2/C2		Excessive backlog			x
MA.2-1	H1/C1		Management not active in minimizing hazards	x		
MA.2-2	H2/C1		Areas not clean and orderly			x
MA.2-3	H1/C2		Lack of emphasis on training of electricians			x
MA.3-2	H2/C1		Materials and spares not controlled	x		
MA.3-3	H1/C1		Uncertified slings and rigging			x
MA.3-4	H2/C1		No system for instrument calibration			x
MA.4-1	H3/C1		Planning and scheduling			x
MA.4-2	H1/C1		Safety related work not prioritized		x	
MA.4-3	H2/C1		Programmatic equipment not maintained		x	
MA.5-2	H1/C1		Corrective maintenance on real property			x

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Masson			Page 2 of 2			
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
MA.5-3	H2/C1		Corrective maintenance on programmatic equipment			x
MA.6-1	H2/C1		Corrective maintenance on real property			x
MA.6-2	H1/C1		Maintenance on cranes and hoists			x
MA.6-3	H2/C1		Preventive maintenance on programmatic equipment			x
MA.7-2	H2/C1		Predictive maintenance			x
MA.8-1	H3/C1		Records not controlled			x
MA.8-2	H2/C1		Procedures not well done			x

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

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PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Heiselmann						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
AX.1-1	H2/C1		Specification and formal documentation for Auxiliary Systems		x	
AX.2-1	H2/C1		Monitoring and disposal hazardous & rad. waste			x
AX.3-1	H2/C1		Storage of radioactive and mixed waste		x *	
AX.4-2	H2/C1		Storage of fissile material at Area V	x		
AX.5-1	H2/C2		Ventilation air flow control		x	
AX.8-1	H2/C2		Programs to ensure checks on engineered safety systems	x		

* Referenced in 3.4.7.2, Finding SF-R-04, page III-25 under TCTA Findings of PT TSA

(This section is in the environmental section of the PT TSA - Chapter 3)

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Martin						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
EP.2-1	H2/C1		No SNL Emergency Plan			x
EP.2-2	H1/C1		Chemical locations knowledge for FP	x		
EP.2-3	H2/C1		No EPZ (offsite hazards)	x		
EP.2-4	H3/C2		Experiment test planning coordination	x		
EP.4-1	H2/C2		Drill deficiency followings			x
EP.5-1	H2/C2		Timely availability of crafts on backshifts	x		
EP.6-1	H3/C2		Rapid chemical hazards assessment	x		
EP.7-1	H2/C2		Mobile radiological monitoring	x		

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

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PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Arendt						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
PT.1-1	H2/C1		Lack of management control			x
PT.1-2	H3/C1		No safety oversight			x
PT.2-1	H2/C1		No formal training program			x
PT.3-1	H2/C1		QA plans not developed for all of PT			x
PT.5-1	H2/C1		No Emergency Response plan			x
PT.6-1	H2/C2		Procedures not written or implemented			x
PT.6-2	H2/C2		No offsite storage for rad. and mixed waste			x
PT.8-1	H3/C2		Onsite transp. not as required by manual			x
PT.11-1	H3/C1		No independent safety			x

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Kolar						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
CS.1-1	2/1		Independent review of proposed experiments and operations	x		
CS.1-3	2/2		Distribution of UOR Notices and TSA Noteworthy Practices	x		
CS.3-1	2/1		Safety analyses of fissile material storage areas	x		
CS.3-2	1/2		Safety of threshold mass limits	x		
CS.3-3	2/2		Checking put to criticality safety analyses		x	
CS.4-1	2/1		Posting of mass limits	x		
CS.5-1	2/2		Criticality alarm system deficiencies	x		
CS.5-2	2/1		Deficiencies in emergency response planning when criticality safety is an issue	x		

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME: Anderson						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
SS.1-1	2/2		Review of modifications, < \$150,000 cost			x
SS.1-2	2/2		Review of design changes considered as "minor"			x
SS.2-1	2/2		Emergency vehicle access/egress--security order inadequacies	x		
SS.2-2	2/2		Coordination of radiological and security interests	x		
SS.3-1	2/2		Hazards of security force presence in facilities	x		
SS.4-1	2/1		Facilities - specific hazard training for security personnel	x		

PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

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PRE TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME:						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
FR.1-1			Management has not defined structure of Safety Review System		x	
FR.1-2			Lack of uniform requirements for appraisal of independent Safety Review System		x	
FR.3-1			Lack of requirements in management's policy		x	
FR.5-2			Triennial appraisal			x

PRE-TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise: RP			
NAME:						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
RP.1-3	2/1		Guidance and Oversight		x	
RP.1-4	2/2		Continued Non-Compliance	X		
RP.2-3	2/1		Internal Audits			x
RP.2-4	2/2		Incident Followup		x	
RP.3-2	2/2		Procedures Ineffective	x		
RP.3-3	2/1		Certification of R.G. Operations	x		
RP.3-4	2/1		Inconsistent Posting	x		
RP.4-1	2/1		Dosimetry Criteria			x
RP.4-2	2/2		Permit System			x
RP.5-2	2/1		Non-employee Exposure Control		x	
RP.5-3	2/1		Dosimeter Calibration	x		
RP.7-2	3/1		Internal Dosimetry Program			x
RP.8-3	2/2		Instrument Availability	x		
RP.8-4	2/2		Remote Area Monitors	x		
RP.9-1	2/1		Air Monitoring			x
RP.10-2	2/1	II	Material Release			x
RP.10-3	2/1	II	Contamination Areas			x
RP.10-4	2/1		Filter Testing	x		
RP.10-5	2/2		Glovebox Gloves	x		
RP.11-1	2/2		Excess Material	x		
RP.11-3	2/1		ALARA Program			x
RP.12-1	3/1		External Exposure Records			x
RP.12-2	3/1		Internal Dose Records			x

PRE-TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise: WS			
NAME:						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
WS.3-1	1/1		Noise & Chemical Monitoring Requirements		x	
WS.3-2	1/1		Confined Spaces			x
WS.4-1	1/1		Aisles, Walkways, and Ladders			x
WS.4-2	2/1		Exits			x
WS.4-3	2/1		Compressed Gas Cylinders	x		
WS.4-4	2/1		Emergency Eyewash			x
WS.4-5	1/1	II	Cranes			x
WS.4-6	1/1	I	Machine Guarding			x
WS.4-7	1/1	II	Machine Guarding			x
WS.4-8	1/1		Hand & Portable Tools			x
WS.4-9	1/1	II	Electrical			x
WS.4-10	2/1		Diving			x
WS.4-11	2/1		Fire Extinguishers			x
WS.4-12	1/1		Hazardous Waste			x
WS.5-1	1/1		Motor Vehicles			x
WS.5-2	1/1		Motor Vehicles			x
WS.5-3	1/1	II	Cranes - Construction			x
WS.5-4	1/1	II	Cranes - Construction			x
WS.5-5	1/1		Ladders and Scaffolding			x

PRE-TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise: IH			
NAME: D. Penfield						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
IH.1-1	H3/C1		Organization & Admin.	x		
IH.1-2	H2/C2		Organization & Admin.	x		
IH.2-1	H2/C1		Procedures & Documentation		x	
IH.3-1	H2/C1		Performance Objective	x		
IH.4-1	H2/C1		Surveillance of Health Concern		x	
IH.5-1	H1/C1		Compliance w/Occ. Health Stds.		x	
IH.5-2	H1/C1		Compliance w/Occ. Health Stds.		x	
IH.5-3	H2/C1		Compliance w/Occ. Health Stds.	x		
IH.5-4	H2/C1		Compliance w/Occ. Health Stds.	x		
IH.5-5	H1/C1		Compliance w/Occ. Health Stds.			x
IH.6-1	H2/C1		Personnel Comm. Prog.	x		
IH.6-2	H3/C1		Personnel Comm. Prog.	x		
IH.6-3	H2/C1		Personnel Comm. Prog.		x	

PRE-TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

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PRE-TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

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PRE-TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

[illegible]

PRE-TIGER TEAM SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise: FS			
NAME: C. Bennett						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
FS.1-1	H2/C2		No SNL Firearms Safety Program Other Than for Security	x		
FS.2-1	H1/C1		SNL Practices Not Consistent with Procedures	x		
FS.2-2	H2/C2		SNL Lack of Policies and Procedures for Non-Security Use of Firearms	x		
FS.3-1	H2/C2		Quality of Annual Appraisals	x		
FS.3-2	H2/C2		No SNL Firearms Safety Appraisals of Non-Security Operations	x		
FS.4-1	H2/C2		No SNL Firearms Safety Training for Non-Security Personnel	x		
FS.5-1	H2/C1		SNL Assurance of Safety & Health at Firing Ranges	x		
FS.5-2	H2/C2		No SNL Mechanism to Address Hazards at CTA Firing Range	x		
FS.5-3	H1/C2		No Program to Assure SNL Terminal Ballistics Facility Hazards Addressed	x		
FS.5-4	H2/C2		DOE 5480.16 Chapter 1 Compliance for SNL Terminal Ballistics Facility			
FS.6-1	H3/C2		SNL Control of Training	x		
FS.7-1	H2/C1		SNL Transportation of Munitions	x		

ATTACHMENT 4

Composite AL Self-Assessment Chart

AL/KAO SELF-ASSESSMENT EVALUATION FORM Part I

[illegible]

AL SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME:						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
OA.1-6	H2/C1		AL - Stop Work Authority			x
OA.1-7	H2/C2		KAO - Stop Work Authority			x
OA.2-3	H2/C1		AL - Lack of Policy & Procedures			x
OA.2-4	H2/C2		KAO - Lack of Safety Objectives			x
OA.5-3	H2/C2		AL - No Self-Assessment Program			x
OA.7-4	H2/C2		AL - In & Out Document Control			x
OA.7-5	H2/C2		KAO - No Assurance for Risk Assessment	x		
QV.1-4	H2/C1		AL - Lacks Independent Oversight		x	
AX.3-2	H2/C2		DOE - HQ Defense Waste Generators Certificates		x	
EP.2-5	H3/C1		DOE/AL - No Energy Plan			x
CS.1-2	H2/C2		AL - Field Organization Appraisals	x		
CS.5-3	H2/C1		AL - Failure to Obtain Variance when Criticality Safety is an Issue	x		
RP.11-2	H2/C2		AL - Excess Material	x		
OS.1-2	H2/C2		AL - Non-compliance with DOE Order 5483.1A	x		
FP.1-2	H2/C1		AL - Not Making Inspections	x		

AL SELF-ASSESSMENT COMPARISON FORM

Subteam: TSA			Area of Expertise:			
NAME:						
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION			
FP.6-1	H2/C1		Pre-fire Plans are not being updated	x		
ES.1-3	H2/C2		KAO - Oversight	x		
FS.1-1	H2/C1		No Firearms Safety Program	x		
FS.1-2	H2/C1		AL - 5480.16 Does Not Specify Specifically Non-Security Firearms Safety Program	x		
FS.3-1	H3/C1		Procedures and Documentation not Formalized or Implemented	x		
FS.3-1	H3/C1		Annual Appraisals not Being Conducted	x		
FS.3-3	H2/C1		No DOE/AL Firearms Safety Appraisal nor Security Operations	x		
FS.4-1	H2/C1		Firearms Safety Training not Fully Developed/Implemented	x		
FS.5-1	H2/C2		No EHS Program in Place	x		
FS.6-1	H2/C2		No Exercise Guidelines	x		
FS.7-1	H3/C1		No Procedures in Place for Transportation, Handling of Ammunition	x		

DOE-AL SELF-ASSESSMENT EVALUATION FORM Part I

Subteam:			Area of Expertise:				
NAME:							
Finding/ Concern Number	Finding Type- CF/BMP	Concern Category I,II,III (S&H)	FINDING TITLE OR DESCRIPTION				
MF			ES&H Responsibility for DOE Activities Performed on Non-DOE Land		x		
MF			Lack of access for ES&H professions in highly restricted areas		x		
MF			DOE/AL review of Non-DOE funded Work and CRADAS		x		
MF			Management Systems			x	
MF			Roles, Responsibilities, Authorities of AL & KAO				x
MF			AT&T Commitment to SNL's ES&H Programs		x		

7.0

**Ross Aviation, Central Training Academy, and
Albuquerque Microelectronics Operation**

**ROSS AVIATION, CENTRAL TRAINING ACADEMY, AND ALBUQUERQUE
MICROELECTRONICS OPERATION**

Three additional facilities, located at Kirtland Air Force Base but not operated by Sandia National Laboratories, Albuquerque, were included in the assessment: Ross Aviation, Central Training Academy (CTA), and Albuquerque Microelectronics Operation (AMO). The general approach to the assessment of the Ross Aviation, CTA, and AMO operations included tours of the sites, a review of documents associated with the sites, and interviews with site personnel. These operations were assessed against the same Federal, State, and local regulations, DOE Orders, and best management practices (BMPs) utilized for the various specialties in the Tiger Team environmental assessment of SNL, Albuquerque. Overview of the individual operations, a summary of the findings, and the Environmental Subteam findings are presented in the following sections.

7.1 ROSS AVIATION

7.1.1 Overview

Ross Aviation is a contractor-operated business working exclusively for the DOE. The contract is administered by the KAO. The operation, located in a former Air Force hanger on Kirtland Air Force Base, employs approximately 175 people to provide passenger and cargo transportation services to the DOE. A total of 11 aircraft are operated by Ross Aviation, with the majority of the maintenance, operation, and control activities occurring in Albuquerque. Ross Aviation provides service on a continual basis (24-hours a day, 365-days a year) to and from DOE facilities throughout the United States. In addition to this service, they also provide support for research activities.

The assessment at Ross Aviation included the following environmental areas: air, surface water, toxic and chemical materials, and waste management.

Water that contains dirt, oil, grease, solvents, and detergents from the washing of aircraft is discharged into hanger drains that lead to storm sewers on Kirtland Air Force Base, and then to the Tijeras Arroyo. Such a discharge requires a National Pollutant Discharge Elimination System (NPDES) permit. Activities to correct this situation are in progress, but funding has not been appropriate for this project. Activities related to air, toxic and chemical materials, and waste management were determined to meet applicable regulations and guidelines.

7.2.2 Compliance Finding

FINDING RA SW/CF-1: NPDES Permits for Ross Aviation

Performance Objective

40 CFR 122.1(b)(1) requires a National Pollutant Discharge Elimination System (NPDES) permit "for the discharge of pollutants. . .into the 'waters of the United States.'"

Finding

Ross Aviation does not have an NPDES permit for discharges to hangar drains that empty into storm drains, which ultimately empty into the Tijeras Arroyo.

Discussion

The drains in the Ross Aviation hangar primarily receive water runoff from the washing of airplanes (I-SW-48). The water contains primarily dirt, grease, oil, solvents, and detergents. The runoff enters the storm sewers, transits Kirtland Air Force Base (KAFB), and eventually enters the Tijeras Arroyo.

Until approximately 4 years ago, KAFB had an NPDES permit for the storm sewers on the base, including the hangar. The Air Force subsequently pulled the permit without notifying DOE, and the Air Force has been found in violation because of the lack of an NPDES permit (I-SW-88).

Ross Aviation discovered that the hangar drains empty into the storm sewer in 1989, and began a process to remedy the situation. This has included the design of a collection system, an oil-water separation system, and monitoring equipment. The system will allow the contents of the collection system to be pumped to the sanitary sewer once the water is tested and determined to meet the criteria for discharge. At the current time, there is still no funding for this project and Ross Aviation continues to discharge into the storm sewer. The issue was identified by Ross Aviation in their environmental self-assessment (SW-44).

7.2 CENTRAL TRAINING ACADEMY

7.2.1 Overview

The Central Training Academy (CTA) is a DOE operation that provides training for security personnel. Two separate facilities are part of CTA: classrooms, and the Live Fire Range. The classroom space is located adjacent to Manzano Base. The Live Fire Range is located in Coyote Canyon. The majority of the training is handled through a contract with Wackenhut Services, Inc. DOE employees provide oversight and administration at the two facilities.

At the CTA, the environmental assessment included surface water, toxic and chemical materials, and waste management.

One issue was identified concerning the provision of potable drinking water to the Live Fire Range. Nonpotable water, trucked to the site by SNL, Albuquerque, was being stored in a nonpotable tank and passed through a charcoal filter prior to supplying water for all activities at the facility, including for drinking. Charcoal filtration removes organic contaminants and chlorine, but does not render nonpotable water suitable human consumption. No other findings were identified.

7.2.2 Compliance Finding

FINDING CTA SW/CF-1: Drinking Water Quality - Central Training Academy

Performance Objective

40 CFR 141 establishes requirements for persons who supply piped water for human consumption. These requirements apply to, among others, supply systems that serve an average of at least 25 individuals daily at least 60 days per year. 40 CFR 141, Subpart B, establishes Maximum Contaminant Levels (MCLs) for drinking water. 40 CFR 141, Subpart C, establishes monitoring and analytical requirements to ensure that the supplied drinking water is below the MCLs. 40 CFR 141.100 requires that point-of-entry treatment systems treat water so that it meets all national primary drinking water regulations. All owners, operators, and suppliers of drinking water should take all measures necessary to ensure that the water being supplied is potable.

Finding

Nonpotable drinking water, supplied by SNL, Albuquerque, to the Live Fire Range operated by the Central Training Academy (CTA) on a weekly basis, is being used for drinking as well as all other processes. This water is not being monitored or analyzed to ensure it meets drinking water standards, nor is the filter system sufficient to ensure that the water meets national primary drinking water regulations.

Discussion

Water for use at the Live Fire Range is supplied by SNL, Albuquerque, by tanker truck on a weekly basis. Although the water supplying the tanker trucks is pumped from one of the three potable water fill sites located at SNL, Albuquerque, the transfer operation and the tankers used for delivery, which are clearly labeled as containing nonpotable water, render the water nonpotable. Once the water is delivered to the Live Fire Range, it is pumped to an underground storage tank. This tank is unlabeled as to its potability. The water is then pumped from the tank through a charcoal filtration system and into the water distribution system.

The charcoal filtration system alone is not sufficient to ensure that the water at the Live Fire Range meets all national primary drinking water regulations. Furthermore, the water is not being monitored or analyzed to ensure that any contaminants that may get into the water during the transfer process are below the MCLs.

Immediately following the identification of this issue on April 28, 1990, CTA provided bottled water for drinking, secured the water fountains to prevent use, and posted notices over the sinks informing personnel not to drink the water at the Live Fire Range. SNL, Albuquerque, Industrial Hygiene Division (3211) also obtained water samples for analysis. SNL, Albuquerque, KAO, and CTA personnel are actively working to resolve this issue.

This finding was not identified in the PTTSA Report, the ES&H Action Plan, or the CTA self-assessment.

7.3 ALBUQUERQUE MICROELECTRONICS OPERATION

7.3.1 Overview

The Albuquerque Microelectronics Operation (AMO) is a separate operation located in Building 870 within Technical Area I at SNL, Albuquerque. It is operated by the Kansas City Division of the Allied-Signal Corporation under contract to the DOE. The operation, currently in the process of being closed down, developed and then produced radiation-hardened integrated circuits. The integrated circuit water fabrication operations were closed down in August 1990, followed by the integrated circuit assembly operations in April 1991. The remaining test and inspection operations are being phased out by October 31, 1991. The AMO will close by the end of December 1991.

Although located at SNL, Albuquerque, the facility functions independently from SNL, Albuquerque. SNL, Albuquerque provides services to the AMO, however, such as: security; medical; environmental, safety and health; plant maintenance and engineering; and utilities.

The environmental assessment at AMO covered air, surface water, toxic and chemical materials, quality assurance, and waste management.

A categorical Wastewater Discharge Permit (Permit No. 2069E-2) from the City of Albuquerque was jointly held among AMO, KAO, and SNL, Albuquerque (SW-59). Following the shutdown, AMO requested that KAO have the permit terminated (SW-56). SNL, Albuquerque, and KAO agreed to request that the categorical permit be terminated, and on April 8, 1991, the city terminated the permit (SW-56).

Although SNL, Albuquerque, continued to collect wastewater monitoring data from the permit sampling point through April 1991, neither KAO nor SNL, Albuquerque, did a walk-through inspection of AMO for the purpose of verifying that no categorical activities were taking place before requesting that the permit be terminated (I-SW-87, I-SW-84). Other than this oversight problem, the Tiger Team identified no problems with the close-out of the facility in regards to surface water issues.

Two findings, in the areas of air quality assurance, were identified. AMO had not submitted applications for registration certifications for sources of air contaminants and hazardous air pollutants as required by Albuquerque/Bernalillo County Air Quality Control Board Regulation 22.01. Also, the AMO did not have an Environmental Quality Assurance Program compliant with DOE 4500.1, DOE 5700.6B, or ANSI/ASME NQA-1. Internal audits within the AMO recognized this deficiency and a conscious decision was made not to comply with these requirements due to the imminent closure of the facility.

No problems were identified in the toxic and chemical materials area or in waste management.

7.3.2 Compliance Findings

FINDING AMO A/CF-1: Air Emission Registration at AMO

Performance Objective

Albuquerque/Bernalillo County Air Quality Control Board (ABC/AQCB), Regulation 22.01, requires that owners or operators of commercial or industrial stationary sources that emit more than 2,000 pounds of any air contaminant per year or any amount of a hazardous air pollutant obtain a Registration Certificate. ABC/AQCB, Regulation 22.02, requires that applications for such Registration Certificates include, among other information, the nature and amounts of any air contaminants emitted from the source.

Finding

Applications for registration certificates have not been submitted to the ABC/AQCB for all Albuquerque Microelectronics Operation (AMO) sources of air contaminants and hazardous air pollutants.

Discussion

AMO identified the need for registering air emissions with the ABC/AQCB during its October 1990 self-assessment. The AMO has advised KAO that Registration Certificates are required and has provided the necessary data to KAO. KAO is currently discussing the past, unregistered AMO air emissions with the ABC/AQCB.

Prior to completing integrated circuit wafer processing in August 1990 and IC assembly operations in April 1991, the AMO emitted in excess of 5,000 pounds per year each of acetone, isopropyl alcohol, and CFC-113. Other emissions included photoresist, sulfuric acid, hydrochloric acid, and solvents. Trace emissions of toxic gases such as arsine, diborane, and phosphine also occurred.

A management agreement between Kansas City Area Office and KAO was executed to clarify administrative responsibilities (A-132). KAO has authority and responsibility to administer the areas of environment, safety and health, and security for AMO.

This issue was identified in the AMO Self-Assessment.

FINDING AMO QA/CF-1:**Albuquerque Microelectronics Operation Quality Assurance Program Plan****Performance Objective**

DOE 5400.1, General Environmental Protection Program, requires that a Quality Assurance Program consistent with DOE 5700.6B be established covering each element of environmental monitoring and surveillance programs.

DOE 5700.6B, Quality Assurance, requires that plans and actions that assure quality achievement shall be established, implemented, and maintained with primary emphasis on achieving a high degree of operational success and with due consideration to health and safety, environmental protection, performance, reliability, and other concerns.

DOE 5700.6B further stipulates that "Quality Assurance activities and the requirements for those activities shall be identified in program plans. In accordance with Federal and DOE standards policies, national consensus standards are to be applied where suitable ones are available. The judicious and selective application of elements of appropriate, recognized standards is encouraged."

DOE 5700.6B also requires that heads of field organizations perform audits and appraisals to verify adequacy and effectiveness of contractor quality assurance programs.

AL 5700.6B, General Operations Quality Assurance, requires that "Quality program plans shall be developed through judicious and selective application of appropriate requirements of national consensus standard ANSI/ASME NQA-1, which shall apply to general operations or support activities."

ANSI/ASME NQA-1, Basic Requirement 2, states "A documented quality assurance program shall be planned, implemented, and maintained in accordance with this standard, or portions thereof."

Finding

Albuquerque Microelectronics Operation (AMO) does not maintain an environmental quality assurance program in accordance with the requirements of DOE 5400.1, DOE 5700.6B, AL 5700.6B, and ANSI/ASME NQA-1.

Discussion

The Tiger Team has identified the following deficiencies in quality assurance applied to AMO environmental activities:

1. The AMO has documented Quality Program Plans for Health, Safety & Environmental Protection and for Hazardous Waste Management. These plans do not meet the requirements of AL 5700.6B because they do not address the 18 Basic Requirements of NQA-1.
2. The Management Agreement (QA-42) which delegates authority for AMO to KAO from DOE/Kansas City Area Office (KCAO) makes KAO responsible for administration in the area of environment. The agreement directs KAO to notify the Area Manager, KCAO, of any areas where AMO is not performing

in proper regard to environmental concerns. The Management Agreement does not indicate who has responsibility for auditing environmental QA activities.

3. Neither KCAO nor KAO have ever audited the Environmental Quality Program. Quality Assurance Survey Reports for 1988, 1989, and 1990 (QA-51, QA-52, and QA-53) conducted by the KCAO did not address the area of environmental quality assurance.
4. AL has never conducted an audit of the Environmental Quality Program at AMO (I-QA-81, and I-QA-82) as required by DOE 5700.6B.
5. In July 1989, a mock Technical Safety Appraisal audit performed by a contractor hired by AMO looked at the AMO ES&H Program and found that "a documented and approved QA Plan/Program which meets requirements of DOE 5700.6B and NQA-1 needs to be established for the facility. A decision needs to be made to determine to what extent compliance is 'feasible' in the limited amount of time remaining" (QA-26, QA-55) (I-QA-66).

However, a decision was made by AMO management not to generate a site specific Environmental QA Program Plan. An AMO internal memo (QA-27) dated November 13, 1990, indicated that due to the accelerated schedule for completion of AMO production, there was insufficient time to generate an AMO-specific documented and approved QA Plan/Program which meets the requirements of DOE 5700.6B and NQA-1. The memo then described the responsibility of Allied-Signal Kansas City Division D/900 QA for AMO including ES&H activity. The memo states "D/900 personnel are assigned to AMO and have on-site responsibility for ES&H." A D/900 representative indicated that the Kansas City Division Operations Manual (QA-54) covered the AMO. However, a copy of the Kansas City Division Operations Quality Assurance Manual was not available for reference at AMO. Thus, there is not direct environmental QA guidance available at AMO. The Allied-Signal, Kansas City Division, Operations Quality Assurance Manual does not adequately address environmental quality assurance (I-QA-63, I-QA-64, and I-QA-66).

6. Memoranda of Understanding between SNL and Allied-Signal, Inc. executed in 1988 (QA-57) and in 1991 (QA-58) indicates that SNL, Albuquerque, will be responsible for all environmental, safety and health monitoring and surveillance, with the exception of hazardous waste management within the AMOs. AMO management incorrectly assumed that SNL, Albuquerque, responsibility for environmental monitoring and surveillance removed AMO's obligation for environmental compliance. The Memoranda or Understanding do not mitigate the requirement under DOE 5700.6B to implement and maintain an Environmental Quality Assurance Program in accordance with NQA-1 (I-QA-66).

This finding was partially identified in the AMO PTTSA Report.

Appendices

Appendix A

Assessment Team Personnel and Biographical Sketches

Appendix A-1

Tiger Team Assessment Team Leader and Team Leader Staff

Sandia National Laboratories

SNL, A TIGER TEAM ORGANIZATION

NAME: David R. Spence

AREA OF RESP: Tiger Team Leader

ASSOCIATION: U.S. Department of Energy
Oak Ridge Operations Office
Strategic Petroleum Reserve,
Project Management Office
New Orleans, LA

EXPERIENCE: 30 Years

- Strategic Petroleum Reserve
 - Assistant Project Manager (APM), Operations: Responsible for Cavern Development and certification; Crude Oil acquisition, transportation and storage; drawdown planning, drawdown and distribution; and operations and maintenance of crude oil storage sites and terminals.
 - Acting APM, Engineering and Construction: Design and construction of crude oil, raw water and brine pipelines; pumping systems, control systems and facilities.
- Oak Ridge Operations
 - Deputy Manager, Gas Centrifuge Enrichment Plant, Centrifuge Machine Office: Responsible for the manufacture, test and acceptance of gas centrifuges for uranium enrichment.
 - Staff Engineer, Quality and Reliability Systems for Uranium Enrichment.
- Northrop Space Laboratories, Huntsville, Alabama
 - Director, System Analysis Division: Responsible for Space Science Payload systems analysis, design and integration.
 - Director, Operations Analysis Branch: Responsible for Ballistic Missile, Space Shuttle, and Space Lab system studies.
 - Director, Space System Branch: Responsible for unmanned planetary system studies for Mars, Comet and Asteroid rendezvous, docking, and sample return missions.
- NASA Manned Spacecraft Center:
 - Senior Engineer: Responsible for Space Science Payload System Design and Integration Studies; Apollo

Experiment Qualification Test Requirements and Apollo
Lunar Surface Experiments Package technical
specifications.

- USAF, Tinker Air Force Base
 - Structures Engineer: Responsible for design of secondary structures for Looking Glass (SAC Flying Command Post) and Night Watch (Air Force One) C-135 Aircraft; and tool and equipment design for aircraft maintenance.

EDUCATION: B.S. Degree in Mechanical Engineering

OTHER:

- University of Oklahoma
 - Chairman, Visiting Committee for Excellence in Education, Aerospace and Mechanical Engineering School.
 - Guest Lecturer, Written and Oral Communications, Education, and System Engineering.
- Educational Outreach, Knoxville and Kingston, Tennessee, High School systems.
 - Guest Lecturer on Importance of Education and Communications.
- Member, Oak Ridge Baseline Assessment Team for the Strategic Petroleum Reserve, Project Management Office.
- Manager, Isotope Production and Distribution Program, ORO
- Author/Co-author: Numerous technical reports and papers on Space Science, Space Systems, Systems Engineering and storage of crude oil in salt domes.

NAME: Mary Meadows

AREA OF RESP: Tiger Team Administrator

ASSOCIATION: U.S. Department of Energy, Headquarters

EXPERIENCE: 32 Years

- U.S. Department of Energy
 - Supervisory Appraisal Specialist, Office of Safety Appraisals: Since 1981, has participated in the overall planning and conducted Tiger Team Assessments, Technical Safety Appraisals, Management Appraisals, Nuclear Safety Program Appraisals, Design Reviews, and Comprehensive Appraisals. Responsible for the overall production of draft reports in the field and final publication of reports at DOE Headquarters. Responsible for providing coordination and editorial support on all DOE Appraisals.
 - Staff Assistant, Office of Environmental Compliance and Overview. Recommended specific changes in administrative procedures for the purpose of increasing efficiency, eliminating unnecessary details, or providing needed management control.
 - Staff Assistant, Office of Bio-Medical and Environmental Research, USAEC, ERDA. Obtained and conveyed information with organizations and individuals outside/inside the Agency which required knowledge in wide range of Agency organization, personnel and procedures.
 - Staff Assistant, Office of the Commissioner, USAEC
 - Administrative Assistant, Office of the Assistant General Manager for Research and Development, USAEC.
- Other Related Experience
 - Administrative and conference planning responsibilities within the USAEC, ERDA, and DOE.

EDUCATION: Numerous work-related courses and workshops at various colleges, training centers, SSDC, and American Management Association

OTHER: Member, U.S. Delegation of Disarmament Conference, Geneva, Switzerland
Recipient of Federal Government Awards for superior performance

NAME: Dale A. Moul

AREA OF RESP: Report Technical Manager

ASSOCIATION: Battelle-Columbus Operations

EXPERIENCE: 21 Years

- Battelle-Columbus Operations
 - Participated in Technical Safety Appraisals for Paducah Gaseous Diffusion Plant, Idaho Chemical Processing Plant, High Flux Beam Reactor, Rocky Flats Plant, and Feed Materials Production Center; and Tiger Teams for the Nevada Test Site, Lawrence Livermore National laboratory, the Argonne Illinois Site, and Oak Ridge National Laboratory
 - Vice President, Security Systems Unit: Manages personnel involved in performing safeguards, security and safety reviews of DOE weapons complex, NRC nuclear and industrial facilities; participates in technical aspects of selected work efforts involving physical security, safety/safeguards interactions, and emergency readiness
 - Program Manager, DOE Office of Security Evaluations support contract for inspections and evaluations of safeguards and security of DOE facilities.
- NUSAC, Inc./Wackenhut Advanced Technologies Corporation
 - Division Manager/Director, Special Projects: Led and participated in support projects for private industry, the nuclear industry, and government involving emergency preparedness, safety/safeguards issues, emergency response training, and legal aspects of regulatory issues
- U.S. Army - Six years of experience involving counterintelligence and physical security assignments. Led teams of inspectors and investigators that performed penetration inspections and counterintelligence/security audits of military installations

EDUCATION: B.S., Social Science, Michigan State University
J.D., Law, University of Maryland

OTHER: Member: Virginia State Bar Association, Certified Protection Professional, American Society for Industrial, Security, Institute of Nuclear Materials Management, Standing Committee on Disaster Management, ASIS, Nuclear Weapons Modernization Task Force, Safeguards and Security Subcommittee

NAME: Sandra A. Pate

AREA OF RESP: Administrative Assistant to Tiger Team Leader

ASSOCIATION: U. S. Department of Energy, Savannah River Operations Office

EXPERIENCE: 24 Years

- U. S. Department of Energy
 - Secretary, Safeguards and Security Division
- Department of Army
 - Personnel Assistant, Civilian Personnel Office
- Carolina Power & Light, Brunswick Nuclear Power Plant
 - Secretary, Administration
- Paralyzed Veterans of America
 - Administrative Assistant

EDUCATION: AAS, Computer Programming

Appendix A-2

Environmental Subteam Members

NAME: Donna A. Bergman

AREA OF RESP: Environmental Subteam Leader

ASSOCIATION: U.S. Department of Energy, Office of Environmental Audit

EXPERIENCE: 15 years

- U.S. Department of Energy
 - Environmental Audit Team Leader for Assessment of Environmental Conditions at the Rocky Flats Plant and Environmental Audit of Nevada Operations Office facilities in Las Vegas, NV and Santa Barbara, CA.
 - Environmental Subteam Leader for Tiger Teams at Nevada Test Site, Lawrence Livermore National Laboratory, Paducah Gaseous Diffusion Plant, Argonne Illinois Site, and SNL, Albuquerque.
 - Team Leader for Environmental Survey Prioritization and preparation of the Final Survey Summary Report.
 - Assistant Team Leader for the Environmental Surveys of 13 DOE facilities. Included planning activities in preparation for the onsite Survey, team management during the onsite Survey, guidance in report preparation, and sampling and analysis responsibilities.
 - Environmental Compliance Coordinator between Idaho Operations Office and DOE-HQ, and Oak Ridge Operations Office and DOE-HQ for purposes of environmental compliance and oversight in regards to applicable environmental requirements.
- Department of Commerce, Economic Development Administration
 - Senior Environmental Protection Specialist responsible for the development and implementation of environmental policy and directives. Provided guidance to regional officers for interpretation of environmental regulations as they related to economic development strategies.
- Department of Interior, Bureau of Land Management
 - Natural Resource Specialist/Planning Coordinator responsible for providing guidance, assistance, and quality control for multiple-use planning. Served as Team Leader for the preparation of comprehensive multiple-use plans.

- Department of Agriculture, Soil Conservation Service
 - Soil Conservationist

EDUCATION: Graduate Studies in Environmental Planning, University of Virginia
B.S., Plant Resources Management, University of Maryland

NAME: Marcus E. Jones

AREA OF RESP: Assistant Environmental Subteam Leader

ASSOCIATION: U.S. Department of Energy, Office of Special Projects

EXPERIENCE: 7 years

- U.S. Department of Energy
 - Assisted in Coordination of Tiger Team Assessments at Hanford and Argonne Illinois Site
 - Assistant Environmental Subteam Leader for Sandia National Laboratories, Albuquerque
- Environmental Strategies Corporation
 - Managed Interim Remedial Measures and Remedial Investigation/Feasibility Study for NPL Site.
 - Wrote Design Specifications for and Managed Remediation Projects Including Excavation of Soil and Installation of Liner at Large, Operating Petroleum Product Tank Farm.
 - Performed Environmental Assessments of a Wide Range of Industrial Facilities for the Purpose of determining the Impact of Industrial Processes, Waste Management, and Other Operations on All Environmental Media.
 - Developed Environmental Compliance Audit Questionnaires for RCRA, SARA Title III, and the OSHA Hazard Communication Standard. Researched Environmental Compliance Issues and Wrote Environmental Fact Sheets for Industrial Clients and Attorneys.
 - Wrote SPCC Plans, Hazardous Waste Management Plans, and Contingency Plans for Various Industrial Facilities.
- Geo/Resource Consultant, Inc.
 - Managed Drilling Operation at Missouri Superfund Site for the Purpose of Collecting Site Characterization Data and Assessment of Applicability of Vadose Zone Monitoring at the Site.
 - Developed Standard Operating Procedures and Questionnaire for Environmental Compliance Audit Program. Conducted RCRA Facility Assessments, Environmental Compliance Audits, and Site Sampling Visits. Wrote Sampling and Analysis Plans.
 - Acted as Information Specialist for the RCRA/Superfund Industrial Assistance Hotline Under Contract with the U.S. EPA's Office of

Solid Waste, Office of Emergency and Remedial
Response and the office of Underground Storage
Tanks.

EDUCATION: M.S.E., Environmental Engineering, University of Alabama
B.S., Biology, University of Alabama

NAME: Atam P. (Al) Sikri

AREA OF RESP: Assistant Subteam Leader

ASSOCIATION: U.S. Department of Energy, Office of Environmental Audit

EXPERIENCE: 24 years

- U.S. Department of Energy
 - Team Leader and Environmental Engineer in the Office of Environmental Audit. Responsible for leading multi-disciplinary teams to perform Tiger Team Assessments and Environmental Audits at DOE facilities.
 - Assessment and Validation Engineer, Office of Program/Project Management, dealing with remedial action and waste technologies. Provided independent appraisal of projects dealing with design/construction, environmental aspects, planning/scheduling, and cost estimating. Also, NEPA Compliance Officer, for the Office of Procurement.
 - Program Manager/Assistant Director, Office of Fossil Energy. Responsible for directing and managing synthetic fuel research, development, and demonstration of technologies. Processes were developed in full compliance with environmental regulations.
 - General Engineer, Office of Defense Programs, having working knowledge of uranium enrichment, project management, and classification determination capability.
- U. S. Corps of Engineers
 - Petroleum Engineer, Technology Review and Modernization Office. Work involved process design, project engineering, and cost studies.
- Other Experience with Private Industry
 - Senior Process Design/Development Engineer. Have worked for DuPont Company, Cities Service Company (now part of Occidental Petroleum Corporation), Johnson & Johnson, and Hoffmann-LaRoche Incorporated.

EDUCATION: Ph.D., Chemical Engineering, University of Pennsylvania
Registered Professional Engineer
M.S.E., Chemical Engineering, University of Michigan
B.S.E., Metallurgical Engineering, University of Michigan
B.S.E., Chemical Engineering, University of Michigan

NAME: Glenn F. Cada

AREA OF RESP: National Environmental Policy Act

ASSOCIATION: Oak Ridge National Laboratory

EXPERIENCE: 14 years

- Preparation of water quality and aquatic ecology portions of NEPA documents for DOE, NRC, and FERC. NEPA documents assessed the impacts of nuclear and hydropower plant licensing, clean coal and synfuels development, and basin-level cumulative effects analyses.
- Field and laboratory research into the effects of energy development on aquatic resources, including power plant entrainment of larval fish, toxicology of synfuels products, evaluation of minimum instream flows associated with water diversions, and environmental monitoring of DOE facilities.
- Technical assistance to DOE's Office of NEPA Oversight, including development of NEPA Compliance Guide and NEPA Compliance Assessment Protocol.
- NEPA Specialist on Tiger Team Assessments of Rocky Flats, West Valley, Pantex, Kansas City Plant, and Savannah River Plant.

EDUCATION: Ph.D., Zoology, University of Nebraska
M.S., Zoology, Colorado State University
B.S., Zoology, University of Nebraska

NAME: Stuart Canton

AREA OF RESP: Waste Management

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 8 years

- Conducted and coached numerous environmental audits in the area of waste management to determine compliance with all applicable Federal, state, and local regulations; with organizational policies; and with good operating practices.
- Legal and Technical Specialist for various clients to advise them of compliance with waste and chemical issues.
- Advising clients regarding involvement and liabilities at hazardous waste sites throughout the country, including extensive review of assessments, remedial alternatives, and actual cleanup.

EDUCATION: J.D., Yeshiva University's Benjamin N. Cardozo School of Law
M.S.L., Environmental Law and Policy, Vermont Law School
B.S., Chemistry, Massachusetts Institute of Technology

NAME: L. Vivian Chavez

AREA OF RESP: Environmental Subteam Administrative Support

ASSOCIATION: Advanced Sciences, Inc.

EXPERIENCE: 12 years

- Advanced Sciences, Inc.
 - Sr. Project Control Manager for the Systems and Technologies Division. Responsible for financial reports for all contracts within the division. Financial management and analysis of the division budget. Supervise and manage administrative staff.
 - Secretary/wordprocessor for the Publications Division. Prepared contract deliverable reports, proposals, statement of qualifications, letters, and memos, also provided graphics support.
- Tierra del Sol Engineering, Inc.
 - Secretary/Office Manager. Handled all bookkeeping (accounts payable and receivable, payroll, quarterly taxes, etc.); typed mylar drawings, and letters, memos; handled all other administrative duties.
- Sandia National Laboratories
 - Student Intern. Provided clerical support to the Computing Division.

EDUCATION: A.A. (in progress), Business Administration, University of Phoenix

NAME: Warren B. Clayman

AREA OF RESP: National Environmental Policy Act (NEPA)

ASSOCIATION: U.S. Department of Energy

EXPERIENCE: 20 years

- Environmental Protection Specialist with the DOE Office of National Environmental Policy Act (NEPA) Assistance. Responsible for the DOE Headquarter's review of Action Description Memoranda (ADM), Memoranda to File (MTF), Environmental Assessments (EA), and Environmental Impact Statements (EIS) to ensure compliance with DOE regulations and Orders and Council on Environmental Quality (CEQ) regulations.
- Senior Environmental Protection specialist with the U.S. Department of Agriculture, Office of Program Support. Responsible for writing, guiding, training, and implementing Farmers Home Administration NEPA regulations throughout a network of 2,500 field offices.
- Director of Planning and Environment with the U.S. Department of Housing and Urban Development, Baltimore Area Office. Responsible for planning grants and environmental compliance in the State of Maryland.
- City and Regional Planner with the Township of Woodbridge, New Jersey and the Maryland National Park and Planning Commission, Silver Spring, Maryland.

EDUCATION: M.U.P., Urban Planning, New York University
M.A., Anthropology, University of Colorado
B.A., Political Science, Ohio University

NAME: Martha A. Curran

AREA OF RESP: Group Coordinator

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 10 years

- Managed a project to assist a group of U.S. utilities in implementing an independent environmental audit program, including developing protocols tailored to the electric utility industry, designing a format for reporting on the compliance status of the companies, and conducting audits at over 40 facilities, including nuclear powered steam electric generating stations, coal and oil fired generating stations, hydroelectric facilities, and substations.
- Managed all aspects of a large civil caseload, including advising clients on the legal implications of environmental audit programs, as well as on a broad range of environmental issues, including hazardous waste, PCB management, and air and water pollution control.
- Key member of the team that developed and implemented Arthur D. Little's comprehensive audit training program that has been taught to over 1,500 people.

EDUCATION: J.D., Boston University School of Law
B.A., Economics and Environmental Studies, George Washington University.

NAME: James P. Daniel

AREA OF RESP: National Environmental Policy Act (NEPA)

ASSOCIATION: U.S. Department of Energy, Office of NEPA Oversight

EXPERIENCE: 15 years

- U.S. Department of Energy
 - Environmental Protection Specialist. Responsible for the review and processing of Department of Energy (DOE) National Environmental Policy Act (NEPA) documentation for approval by the Assistant Secretary for Environment, Safety and Health.
 - NEPA Group Leader, Environment Subteam, DOE. Performed DOE "Tiger Team" surveys at the Paducah and Portsmouth Gaseous Diffusion Plants, Pinellas Plant, and Sandia National Laboratories (Albuquerque) to evaluate the adequacy of NEPA documentation.
- Environmental Biologist/Project Manager, Federal Energy Regulatory Commission (FERC)
 - Responsible for the preparation and review of environmental assessments (EAs), environmental impact statements (EISs), and related NEPA documentation for natural gas pipelines, liquified natural gas (LNG) plants, and associated facilities proposed for certification.
- Research Assistant, Wheeler Industries, Inc.
 - Responsible for the preparation of environmental analysis and reports for mariculture operations, biological filters, and underwater ship husbandry.

EDUCATION: Graduate Studies in Environmental Biology, George Mason University
B.S. Wildlife Management, Northwestern State University of Louisiana

NAME: Gerald K. Eddlemon

AREA OF RESP: National Environmental Policy Act

ASSOCIATION: Oak Ridge National Laboratory

EXPERIENCE: 17 years

- Preparation of aquatic ecology sections of Environmental Impact Statements and Environmental Assessments for nuclear power generating stations, geothermal projects, coal conversion facilities, weapons ranges, and DOE and Department of Defense, defense facilities.
- Participation in Tiger Team Assessments of West Valley Demonstration Project, Pantex Plant, Nevada Test Site, Savannah River Site, Hanford Site, and Princeton Plasma Physics Laboratory.
- Participation in environmental compliance audits of 15 Department of Defense facilities across the U.S. and Greenland.
- Technical assistance to the DOE Office of NEPA Oversight, including technical and regulatory analyses and development of the DOE NEPA Compliance Audit Protocol, the DOE Environmental Compliance Survey Manual.
- Research in the Synthetic Fuels Program, including transport, fate, and effects of trace contaminants in aquatic ecosystems.

EDUCATION: M.S., Zoology, University of Tennessee
B.S., Zoology, University of Tennessee

NAME: Gregory T. Haugan, Jr.

AREA OF RESP: Environmental Report Administration

ASSOCIATION: META

EXPERIENCE: 8 years

- META
 - Information Management Specialist. Manages a team responsible for onsite administrative support for the Environmental Subteam during Tiger Team Assessments. Efforts to date include Brookhaven, Sandia National Laboratory, Lawrence Berkeley Laboratory, Princeton Plasma Physics Laboratory, and the Energy Technology Engineering Center.
- UDI Contractors, Inc.
 - Project Manager and Administrator. Supervised field operations and managed office administration for a construction management firm.
- GLH, Inc.
 - Program Analyst. Specialized in research, report writing, and project management software for an information resources software consulting firm.

EDUCATION: B.A., General Studies, University of Maryland

NAME: Richard H. Hubbell

AREA OF RESP: Air

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 21 years

- Responsible for a wide variety of projects involving complex thermo-mechanical systems over the past 12 years. These have included designing thermodynamic cycle for oxygen/helium/methane refrigerators and liquefiers, air separation plants, and process heat exchangers.
- Responsible for the process and thermal design of a tritium distillation system for Westinghouse Savannah River Company during 1990.
- Responsible for evaluating the effectiveness of air pollution control equipment in a wide variety of settings. these efforts have involved a detailed review of equipment design, material specifications, computer control, power consumption, and operating efficiency.

EDUCATION: M.S., Heat Transfer and Transport Processes, Cornell University
B.S., Mechanical Engineering, Cornell University.

NAME: Frederic M. Iannazzi

AREA OF RESP: Waste Management

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 11 years

- Primary focus is in the area of hazardous waste management, including operations and management systems evaluations, environmental risk assessment, market analysis and strategic business planning, and technical environmental support activities.
- Directed independent evaluations of existing waste operations and environmental management systems, focusing on effectiveness of implemented systems to promote environmental regulatory compliance.
- Directed the preparation of a RCRA Part B Permit application for a commercial hazardous waste company's proposed incineration facility.
- Directed a project to gather and analyze 10 years of environmental compliance history for a commercial hazardous waste management company's 26 waste management facilities. Facilities ranged in complexity of operations from transfer stations to integrated treatment and disposal operations.

EDUCATION: M.S., Environmental Management, University of New Hampshire
B.S., Business Administration, Northeastern University

NAME: David Isenberg

AREA OF RESP: Inactive Waste Sites

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 10 years

- Responsible for designing and conducting a program for monitoring volatile organic chemicals released from an operating sanitary landfill. The landfill was known to have accepted hazardous wastes prior to regulations restricting the acceptance of these materials. The data collected from the monitoring was then to be used to develop a public health risk assessment to evaluate chemical exposure that downwind neighbors received.
- Member of over 20 environmental auditing and occupation health and safety program assessment teams. Responsible for inspecting facilities in both North America and Central America to evaluate their compliance with Federal, state, local and corporate water health, and safety regulations. These projects have been conducted in a variety of industrial and manufacturing environments including: aerospace industries, automotive parts manufacturers, shipbuilding facilities, tropical fruit plantations and their associated packaging and shipping terminals, paper companies, research laboratories, a solvent processing facility and a carbon products plant.
- Certified Industrial hygienist (C.I.H.) and a member of several professional organizations including the American Industrial Hygiene Association, American Board of Industrial hygienists, and the Air and Waste Management Association. An EPA and Commonwealth of Massachusetts accredited Asbestos Inspector and Asbestos Abatement Management Planner. He has also been trained as a hazardous waste site manager and worker.

EDUCATION: M.S.P.H., Environmental Health, University of Washington
School of Public Health
B.S., Environmental Health, Western Washington University.

NAME: Richard B. Lynch

AREA OF RESP: Environmental Subteam Report Quality

ASSOCIATION: META

EXPERIENCE: 4 years

- META
 - Technical Editor/Graphics Specialist. Provides editorial support for the Environmental Subteam during Tiger Team Assessments including text editing, formatting, and graphics production. Efforts to date include Sandia National Laboratory - Livermore, Paducah Gaseous Diffusion Plant, Argonne Illinois Site, Princeton Plasma Physics Laboratory, and the Energy Technology Engineering Center. Also, finalizes draft Tiger Team Assessment reports to provide DOE's Office of Special Projects with the final camera-ready copy.
- Advanced Sciences, Inc.
 - Writer/Editor. Researched, wrote, and edited fact sheets and information briefs on energy conservation and renewable energy topics for a DOE-funded energy information service. Also, wrote press releases and participated in other media outreach activities.

EDUCATION: B.A., General Studies, Louisiana State University

NAME: Steven Masciulli

AREA OF RESP: Radiation

ASSOCIATION: Vertechs, Inc.

EXPERIENCE: 15 years

- Vertechs Inc., Senior Specialist, responsible for health physics, dose assessments, emergency planning, audits, appraisals, and computer applications. Served on Lawrence Livermore National Laboratory, Paducah Gaseous Diffusion Plant, and Argonne National Laboratory Site DOE Tiger Teams and the EG&G/EM Environmental Audit Team.
- Cygna Group, Division Manager and Senior Technical Specialist, responsible for health physics, emergency planning, quality assurance and computer application.
 - Performed numerous investigations, audits and appraisals of applied health physics and radiological environmental and effluent monitoring programs. Served on DOE Nevada Test Site Tiger Team.
 - Developed and ran database and computer programs for offsite dose assessment, radiological effluent monitoring, control room habitability, and shielding analysis. Supervised radiological environmental monitoring laboratory.
- New York Power Authority
 - Senior Radiological Appraisal Specialist: responsible for developing and implementing appraisal program for health physics and radiological effluent and environmental monitoring programs.
 - Supervisory Radiological Engineer: supervised a group with responsibility for development and implementation of health physics and environmental programs.
- Consolidated Edison Company of New York, Inc., Nuclear Environmental Monitoring Engineer.
- General Dynamics Corporation, Electric Boat Division, Radiation Control Engineer.

EDUCATION: M.S., Applied Science, New York University
B.S., Radiological Sciences, Lowell Technological Institute

NAME: James W. Melloni, Jr.

AREA OF RESP: Quality Assurance/Quality Control

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 13 years

- Served as Quality Assurance Manager on a Department of Energy Program through Westinghouse Savannah River Company; was responsible for implementing a manufacturing/quality program that has been certified by the American Society of Mechanical Engineers (ASME).
- Served as Quality Assurance Manager for a major project for U.S. Army CRDEC which involved oversight of the design, fabrication, test, and delivery of sever prototype air-monitoring laboratories and shelters. This project required the generation of the Quality Assurance Program Plan covering all phases of the project. The program encompassed both test and inspection.
- Served the U.S. Air Force Prototype Flight Cryocooler (PFC) program office as Quality Assurance Manager; revised the Quality Assurance manual to update and improve Arthur D. Little quality practices, primarily in the area of quality systems; implemented a failure analysis an corrective action system and initiated audits and reviews of all the quality and manufacturing operations.

EDUCATION: M.B.A., Business Administration, New Hampshire College
B.S., Biology, Boston College

NAME: Margaret A. Miller

AREA OF RESP: Toxic and Chemical Materials

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 21 years

- Developed and administered, 1979 through 1985, the Arthur D. Little program for compliance with Federal (FDA & EPA) regulations affecting the conduct of non-clinical laboratory studies. This involved the management of the generation, collection and reporting of original experimental observations.
- Consultants in area of quality assurance program design for commercial clients. Conducted a confidential survey of leading contract laboratories to compare procedures for reporting on internal audit results.
- Managed data retrieval and organization for evaluations of the health and environmental implications of the use and disposal of a variety of commercial products and toxic materials. These studies resulted in action-alert reports, risk analyses, and publications such as *The Installation Restoration Program Toxicology Guide*, of which Ms. Miller is a co-author.

EDUCATION: M.S., Library and Information Science, Simmons College
B.A., Government (Biology Minor), Wells College
Post-Graduate Chemistry courses, Tufts University,
Northeastern University

NAME: Mary B. Peters

AREA OF RESP: National Environmental Policy Act

ASSOCIATION: Labat-Anderson, Incorporated

EXPERIENCE: 8 years

- Manages the preparation of EISs and EAs for Air Force actions.
- Prepares the biology, cultural resources, and noise sections of EISs, EAs, and a legislative EIS on weapons systems deactivations, realignments and force structure changes at Air Force installations, munitions development and deployment at Army installations. Performs technical reviews of environmental documents for the Air Force, Army, Strategic Defense Command, Corps of Engineers, and DOE.
- Managed and participated in an emissions and offset analysis of air quality in southern California for the Air Force.
- Identifies and delineates wetlands, and performs environmental, engineering, and regulatory reviews of water development projects for A/E firms.
- Interdisciplinary team member responsible for environmental and technical review of RI/FS work plans and EE/CA reports.

EDUCATION: B.S., Fisheries and Wildlife Biology, University of North Dakota
Courses in Geohydrology and Civil Engineering, University of Nebraska

NAME: William G. Rhodes

AREA OF RESP: Deputy Group Coordinator

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 11 years

- For Knolls Atomic Power Lab, Mr. Rhodes was responsible for the radiological environmental monitoring program. This program included air sampling of stack effluents, groundwater monitoring, river monitoring, surface water monitoring and quality assurance programs. Mr. Rhodes was also responsible for a three site action program to ensure that each site complied with new Environmental Protection Agency radionuclide emission standards.
- Served on a General Electric Company management team that reviewed operations of a hot cell laboratory. The review was conducted to ensure that radiological operations were being conducted in a safe and efficient manner. The team identified findings which were presented to senior management and written into a report with recommendations. Followup audits were conducted to monitor corrective actions.
- Member of a General Electric audit team that examined radiological environmental monitoring and radioactive waste practices at a prototype reactor site. Mr. Rhodes also conducted inspections and audits of various radiological facilities, including X-ray machine labs, radiochemistry labs, a radioactive waste handling facility, fuel fabrication labs, and facility decontamination and decommissioning activities.

EDUCATION: M.S., Radiological Sciences and Protection, University of Lowell
R.T (ARRT), Registered Radiological Technologist, Wittenberg University and Mercy Medical Center
B.A., Physics and Biology (Dual Major), Wittenberg University

NAME: Jean C. Schumann

AREA OF RESP: Waste Management

ASSOCIATION: U.S. Department of Energy, Office of Environmental Guidance

EXPERIENCE: 7 years

- U.S. Department of Energy
 - Environmental Protection Specialist responsible for developing RCRA policy and coordinating DOE comment on EPA's RCRA regulations. Also develop policy on CERCLA, TSCA, and OSHA.
- U.S. Department of Energy, Office of Environmental Compliance
 - Environmental Protection Specialist responsible for conducting independent oversight of environmental compliance activities for facilities under the Albuquerque Operations Office.
- U.S. Environmental Protection Agency, Emergency Response Division
 - Environmental Protection Specialist responsible for developing policy for the CERCLA removal program, with an emphasis on program compliance with RCRA land disposal restriction requirements.
- ICF Incorporated, Technical Assistance Team (TAT)
 - Environmental Analyst responsible for providing research, analytical, and policy support to the U.S. EPA CERCLA removal program.
- U.S. Synthetic Fuels Corporation, Office of Environment
 - Assistant Environmental Analyst responsible for assisting in evaluation of environmental requirements for commercial synthetic fuel projects requesting federal financial assistance.

EDUCATION: B.A., Environmental Studies, University of California, Santa Barbara

NAME: Andrew H. Smyth

AREA OF RESP: Groundwater

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 8 years

- Managed the geotechnical aspects of Arthur D. Little's *SiteWATCH* assessment program. The objective of this program was to classify commercial treatment storage and disposal (TSD) facilities into their relative risks to the user based on their historical performance, operations, and siting characteristics. These facilities included incinerators, landfills, and solvent recovery operations. Particular responsibilities included inspection TSD facilities, assessing regulatory compliance, and evaluating general location and siting considerations. Over 50 TSD facilities were inspected.
- Evaluated the contaminant fate and transport characteristics of numerous contaminated sites. Included in these characterizations were the development of site sampling programs, installation of ground water and soil monitoring systems, evaluation of site chemical data and computer modelling of geohydrologic systems and selection of evaluation of remedial technologies.
- Participated in over 100 environmental audits and assessments at various chemical, industrial, government, utility, mining, machining, transportation, and fossil fuel production and distribution companies.

EDUCATION: M.S., Geology with minors in Civil and Geologic Engineer,
New Mexico State University
B.A., Geology, Ohio Wesleyan University

NAME: Janet M. Stevens

AREA OF RESP: Surface Water

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 17 years

- Participated in a large number of environmental projects including evaluation of the impacts of snow and ice removal techniques on surface and ground waters, compilation of information for the evaluation of substitute chemicals for pesticide use, compilation of water pollution catalogue, evaluation of the impact of the disposal of pesticide containers on the environment, and preparation of environmental impact statements.
- Key person on a major project for the Department of Defense (DOD) to provide assessment support for major automation projects. Work involves the design and development of data collection methodologies, protocols and instruments, data collection, analysis, and report preparation. She has supervised up to 35 data collectors - both locally hired and members of the Arthur D. Little staff - during onsite data collection, including collection of original data, review of files and reports, interviews, etc. She also provides review and analysis of documents prepared for/by DOD, the Military Departments, and other support contractor to ensure compliance with applicable DOD Directives, MilDep Regulations, external agencies, etc.
- Program manager for a project to provide the Government with measurements of physical properties of material such as thermal and surface properties. Oversees all laboratory work and analysis and prepares reports.

EDUCATION: M.B.A., Northeastern University
M.S., Chemical Engineering, Washington University
B.S., Chemical Engineering, Northeastern University

NAME: James I. Stevens

AREA OF RESP: Inactive Waste Sites

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 48 years

- Has performed approximately 100 environmental assessments over a period of 14 years in a wide variety of industries, concentration on the technical/regulatory aspects of air, surface water, drinking water, RCRA, CERCLA, and PCBs.
- Has been team leader of environmental assessment teams in the process industries such as pulp and paper, chemicals, aerospace and automotive.
- Author of many articles on the technologies and economics of pollution control. Contributed sections to books on hazardous chemical waste management and sludge treatment. Has written many reports on the performance of technologies in the high-level radioactive waste treatment field.

EDUCATION: M.Ch.E., University of Louisville
B.Ch.E., University of Louisville

NAME: Virginia R. Tolbert, Ph.D.

AREA OF RESP: National Environmental Policy Act

ASSOCIATION: Oak Ridge National Laboratory

EXPERIENCE: 11 years

- Preparation of aquatic ecology sections of Environmental Impact Statements for uranium mill tailings decommissioning, U.S. Army programmatic and site-specific disposal of chemical agents and munitions, and operation of nuclear power plants; Environmental Assessments for coal conversion, geothermal, and synthetic fuels plants, fuel fabrication facilities, and various Air Force base projects.
- Technical assistance to the DOE Office of NEPA Oversight. Participated in development of the draft DOE Compliance Guide and the DOE NEPA Compliance Audit Protocol.
- Preparation of aquatic sections of a long-range assessment of the economic impacts of utilizing coal as a fuel source. Issue identification for relicensing of nuclear power plants.
- Biomonitoring and basic research of effects of toxicants on aquatic biota.

EDUCATION: Ph.D., Ecology, University of Tennessee
M.S., Ecology, University of Tennessee
B.S., Biology, East Tennessee State University

NAME: Helen C. Walters

AREA OF RESP: Environmental Subteam Administrative Support

ASSOCIATION: META

EXPERIENCE: 15 years

- META

- Information Processing Specialist. Provides administrative support for the Environmental Subteam on Department of Energy Tiger Team Assessments.

- Cate & Associates, Chartered

- Administrator. Served as Executive Assistant with administrative responsibilities for filing estate accounting in excess of \$125,000 to the Commissioner of Accounts; liaison with attorneys and the courts in regard to these accounting; handled accounts receivables and payables.

- National Council of Farmer Cooperatives

- Administrator. Responsible for administration of financial and human resources for a staff of 13 professional and 13 support staff. Duties in the area of finance included the preparation and oversight of an annual operating budget of 2.5 million with reporting responsibility to a committee composed of board members. Duties in the area of human resources included hiring and training of all support staff, and developing and coordinating employee benefits packages. Responsible for accommodating 65 employees in newly constructed 17,000 square foot office space.

EDUCATION: B.S., Business, Kent State University

Appendix A-3

Safety and Health Subteam Members

NAME: Steve K. Singal

AREA OF RESP: Safety and Health Subteam Leader

ASSOCIATION: Office of Safety Appraisals, Headquarters, Department of Energy

EXPERIENCE: 21 years

- U.S. Department of Energy, Washington, DC
 - Office of Safety Appraisals: Safety and Health Subteam Leader for Tiger Team Assessments and Technical Safety Appraisal Team Leader
 - Office of Civilian Radioactive Waste Management: HQ Study Plan Coordinator for the characterization of the Yucca Mountain Deep Geologic Repository
 - Office of Fuels Conversion: Environmental Engineer, responsible for preparation of EIS for coal-conversion of NYC's Arthur Kill and Ravenswood Powerplants (DOE's Office of Fuels and Conversion)
- Federal Energy Regulatory Commission
 - Project Manager: responsible for review of license applications for hydroelectric power projects
- State of Maryland
 - Environmental Engineer: responsible for enforcement of air, water, solid waste, and noise pollution control laws.

EDUCATION: J.D., Law, Catholic University Law School
M.S., Civil Engineering, Brigham Young University
B.S., Civil Engineering, Roorkee University, India

OTHER: Licensed to practice law (Maryland)
Registered Professional Engineer (Maryland)

NAME: Leonard M. Lojek

AREA OF RESP: Associate Safety and Health Subteam Leader

ASSOCIATION: Office of Safety Appraisals, Headquarters, Department of Energy

EXPERIENCE: 31 years

- U.S. Department of Energy, Washington, DC
- Safety and Health Subteam Leader for Tiger Team Assessments and Technical Safety Appraisals Team Leader. Leader or team member on 12 TSA's.
- Quality Assurance Manager, Assistant Secretary for Environment, Safety and Health, DOE
- Quality Assurance Program Manager, Assistant Secretary for Fossil Energy, DOE
- Program Manager of R&D efforts in Solvent Refined Coal Conversion Programs (SRC-I and SRC-II), Assistant Secretary for Fossil Energy, DOE
- Chemical Systems Laboratory, DoD
 - Project Manager and Project Engineer for disposal of obsolete toxic chemical munitions
 - Product Engineer for smoke and pyrotechnic chemicals, and for riot control chemicals; Process Engineer for plasticized white phosphorus munitions
- Calgon Corporation
 - Technical Service Engineer for industrial and utility water treatment systems

EDUCATION: M.S.A., Management Engineering, George Washington University
B.S., Chemical Engineering, Carnegie-Mellon University

OTHER: Member: AICHE, ASQC, and ADPA

NAME: Ronald E. Alexander

AREA OF RESP: Occupational Safety

ASSOCIATION: Environmental Management Associates

EXPERIENCE: 20 Years

- Environmental Management Associates
 - Prepare applications for air, RCRA, NPDES, waste water, and solid waste permits for private companies and Government agencies; prepare environmental liability assessments; perform OSHA compliance evaluations; prepare safety analysis documents and safety analysis reviews; prepare radiation protection program manuals; establish employee hazard communication programs; and conduct underground storage tank investigations.
- Mason & Hanger - Silas Mason Co., Inc.
 - Managed DOE Environmental Restoration Program for CERCLA investigations and remedial actions; supervised eight RCRA hazardous waste storage and treatment units; and established and managed an environmental protection and compliance program for a major manufacturing facility.
 - Managed a health protection program for approximately 3,000 employees.
 - Conducted research and development on solid state radiation dosimeter and supervised its manufacture and deployment.
 - Safety Engineer, general.

EDUCATION: B.S., Physics, Texas Tech University
Graduate course work in Industrial Technology, West Texas State University
Course work at Texas Junior College

NAME: J. Kenneth Anderson

AREA OF RESP: Security/Safety Interface

ASSOCIATION: Private Consultant

EXPERIENCE: 40 Years

- Manager, Safety Assessment Office, Westinghouse Hanford
- Manager, Nuclear Safety, Westinghouse Hanford
- Executive Secretary and Member, Westinghouse Hanford Safeguards (Nuclear Facility Safety Review) Council
- Nuclear facility (reactor and nonreactor) design analysis, operations analysis, and safety analysis at Hanford
- Member of nine DOE Technical Safety Appraisal teams
- Classification Officer, Westinghouse Hanford
- Six years experience in experimental and analytical heat transfer and hydraulics

EDUCATION: B.A., Physics, University of Utah
Graduate courses in physics, mathematics, and reactor and design analysis, University of Idaho

NAME: John W. Arendt

AREA OF RESP: Packaging and Transportation

ASSOCIATION: John W. Arendt Associates, Inc.

EXPERIENCE: 47 years

- John W. Arendt Associates, Inc.
 - Senior Engineer: Provide technical assistance in the fields of: (1) UF_6 handling, (2) packaging and transportation of hazardous waste and radioactive materials, (3) quality assurance, (4) standards and regulations, and (5) engineering and management consultation
- JBF Associates, Inc.
 - Provided technical and management advice to the President in fields of uranium enrichment, standards and regulations, waste management, packaging and shipping, reactor activities, and quality assurance
- Nuclear Division, Union Carbide Corporation
 - Staff Engineer: coordinated preparation of planning document on waste management and environmental problems at Y-12. Served on Y-12 Mercury Task Force and chaired Environmental Impact Committee
 - Superintendent, Planning/Budgeting in Gas Centrifuge Program
 - Project Manager for UCC-ND Uranium Resource Evaluation, part of the National Uranium Resource Evaluation (NURE) Project
 - Superintendent of Physical Measurements, Inspection, Metallurgical and Nuclear Engineering
 - Production Supervisor for in-plant handling, measuring, storing, packaging and shipping of nuclear materials
- Research Assistant, Manhattan Project, University of Chicago

EDUCATION: B.S., Chemical Engineering, Marquette University

OTHER: Registered Professional Engineer, State of Tennessee, 1974
Certified Nuclear Materials Manager

Member: Nuclear Standards Board, American National
Standards Institute (Chairman, N14 Committee), ANS,
ASME, ASQC, ASNT, INMM, NSPE, TSPE, and ADPA

NAME: Mayhue A. Bell

AREA OF RESP: Site/Facility Safety Review

ASSOCIATION: Viking Systems International

EXPERIENCE: 30 years

- Private Consultant
 - Technical, operations, and management consultant related to Tiger Team Assessments and Technical Safety Appraisals. Consultant to IAEA on emergency preparedness.
- U. S. Department of Energy, Washington, DC
 - Managed the DOE Reactor Safety, Fusion Safety, Space Power System Safety, and Emergency Preparedness programs: Policy and safety requirements development, planning and coordination.
 - Performed technical safety appraisals for 15 years.
- Carolinas Virginia Nuclear Power Associates, Inc.
 - General Manager: Responsible to sponsoring power companies (Duke, CP&L, SCE&G, and Virginia Electric).
 - Operating Director: Directed company operations, including technical support, health and safety, plant operations and testing, experiments, research, training and certification, and emergency preparedness.
- Nuclear Regulatory Commission
 - Reactor Inspection Specialist: performed inspections of licensed facilities during construction, plant testing, and operation.
- Du Pont, Savannah River Plant, Aiken, South Carolina
 - Senior Supervisor, Plant Operations: Reactor operations and operator training and qualification.

EDUCATION: B.S., Nuclear Engineering, North Carolina State University
Diploma, Nuclear Power Reactor Safety, Harwell, England

Diploma, Quality Assurance Nuclear Power Industry, NRC
Diploma, Federal Executive Institute, University of
Virginia

NAME: Cheryl Bockrath Bennett

AREA OF RESP: Firearms Safety

ASSOCIATION: Lawrence Livermore National Laboratory

EXPERIENCE: 10 years

- Lawrence Livermore National Laboratory
 - Project Manager: Provide technical and administrative support to the DOE Firearms Safety Program. Includes coordinating the DOE Firearms Safety Committee activities, facilitating firearms safety information/communication, and developing the Firearms Safety Appraisal Guide. Member of all functional firearms safety appraisals conducted by the Office of Quality and Safety Programs.
 - Industrial Safety Engineer: Specialist for Safeguards and Security and other support programs. Developed preplacement strength testing program.
- Matsco
 - Safety Engineer: Ergonomics/human factors and systems safety for Life Sciences Flight Experiments Division, Ames Research Center, NASA.
- Continental Maritime, Inc.
 - Safety and Health Manager: Ship repair and conversion operations.
- Fujitsu, Ltd.
 - Research Associate: Human factors/ergonomics research in electronics research and development facility.

EDUCATION: M.S., Occupational Health and Safety Engineering, Texas Tech University
B.S., Safety, California State University
Japan America Institute of Management Science

OTHER: Certified Safety Professional
Member: American Society of Safety Engineers, Human Factors Society

NAME: B. Ann Bowden

AREA OF RESP: Coordinator

ASSOCIATION: Office of Safety Appraisals, Headquarters, Department of Energy

EXPERIENCE: 32 years

- U.S. Department of Energy, Washington, DC
 - Appraisal Specialist: Participate in the planning, coordination and final production of Technical Safety Appraisal reports. Maintain appraisal reference center.
 - Coordinator for the Safety and Health Subteams, Technical Safety Appraisal reports for the Tiger Team Assessments at:
 - Princeton Plasma Physics Laboratory, Princeton, NJ;
 - Lawrence Berkeley Laboratory, Berkeley, CA;
 - Oak Ridge National Laboratory, Oak Ridge, TN;
 - Paducah Gaseous Diffusion Plant, Paducah, KY;
 - Hanford Site, Richland WA.
 - Defense Programs, Office of Classification and Technology Policy: Responsible for scheduling, organizing and participating in DOE/Contractor Classification Officer's meetings; secretarial supervisor.
- U.S. Nuclear Regulatory Commission
 - Inspector and Auditor Assistant, Office of Inspector and Auditor. Participated in investigations/inspections and audits; FOIA Coordinator; Security Liaison Officer; Office Manager; and secretarial supervisor.
- U.S. Atomic Energy Commission
 - Various secretarial positions in the following offices: Health and Safety; Military Application; Security; Reactor Development and Technology; Environmental Protection.

EDUCATION: Numerous work-related courses/workshops (FOIA Workshop, Professional Woman's Workshop; computer courses; office management, etc.)

OTHER: Member: Federally Employed Women
Recipient of several Federal Government Awards for superior performance

NAME: Lorin C Brinkerhoff

AREA OF RESP: Organization and Administration

ASSOCIATION: Private Consultant

EXPERIENCE: 37 years

- Private Consultant associated with SCIENTECH, Inc., ORAU, and EG&G, Idaho, Inc.
- Technical Safety Appraisal Team Leader, DOE Office of Safety Appraisal
- Acting Reactor Safety Branch Chief, DOE Headquarters
- Senior Nuclear Safety Specialist, AEC, ERDA, DOE
- Senior Nuclear Engineer, Aerojet General Corp., Nerva Program, Nuclear Rocket Development Station (NRDS), Nevada
- Manager, Nuclear Critical Facility, Lawrence Livermore National Laboratory
- Reactor Foreman, Phillips Petroleum Co., Idaho Test Site
- Graphite Studies Group, General Electric Co., Hanford, Washington

EDUCATION: B.S., Chemical Engineering, University of Utah

OTHER: Member: ANS-15 Standards Committee on Research Reactor Safety (1980-1989), ANSI N-16 Standards Committee on Nuclear Criticality Safety (1978-1984), Listed in "Who's Who in the East" and "Who's Who in the World"

NAME: Scott C. Cassady

AREA OF RESP: Worker Safety and Health (OSHA) Compliance

ASSOCIATION: National BioSystems, Inc.

EXPERIENCE: 4 years

- National BioSystems, Inc.
 - Perform health and safety inspections at selected Department of Energy research and production facilities. Identify, classify, and report all occupational safety and health violations, provide interpretation of Federal regulatory agency standards, and conduct routine industrial hygiene activities.
 - Participated in Lawrence Berkeley Laboratory, Princeton Plasma Physics Laboratory, Energy Technology Engineering Center, and Sandia National Laboratories Tiger Team Assessments/Technical Safety Appraisals.
- American Express Travel Related Services
 - Computer Operator III; Maintained data host system for local and remote station users. Maintained proper allocation of resources for timely execution of production/test jobs/ monitored and controller system activity, job flow, applications, system/network resources, and user access.
- U.S. Department of Labor/OSHA Area Offices
 - Assistant Database Manager: Developed database covering OSHA standards and reports for use by Federal offices nationwide. Provided for database access through multiple database programs and utilities including OLIVE, DBASE III, VAX/VMS, BASIS, and UNIX. Assisted in development of equipment inventory control system.
- Personal Software/LJ Software
 - Consultant/Program Designer: Designed, tested, and debugged computer applications related scheduling, medical services, and educational services.

EDUCATION:

B.S., Computer Science/Electrical Engineering,
Villanova University (in progress)

B.S., Astrophysics/Astronomy, Villanova University (in
progress)

NAME: Woodson B. Daspit

AREA OF RESP: Training and Certification

ASSOCIATION: W.B.D. Consulting Corporation

EXPERIENCE: 40 years

- Consultant
 - Reactor operations, training and certification, auxiliary systems, technical support, reactor design, and general reactor technology
 - Westinghouse Electric and Bechtel National Corporations: conceptual design of new production reactor
 - Team member on 11 Technical Safety Appraisals
- Du Pont, Savannah River Plant
 - Senior Reactor Associate for advanced studies
 - Process Associate for advanced studies: procedure enhancement, training, and simulator procurement
 - Chief Supervisor for reactor physics, hydraulics, reactor operational support, criticality studies, heavy water technology, production reactor charge design, test reactor technical assistance, and manual and automated production calculations
 - Part time operator licensing examiner for Nuclear Regulatory Commission
 - Site Emergency Response Committee
 - Supervisor responsible for mechanical, electrical instrument assistance groups, and for shielding calculations
 - Experimental Physics: Critical facility startup and operation
- U.S. Naval Ordnance Test Station

EDUCATION: M.S., Physics, Louisiana State University
B.S., Physics, Louisiana State University

OTHER: Member: American Nuclear Society, Sigma Xi, Sigma Pi
Sigma

NAME: Clarence D. Eggen

AREA OF RESP: Fire Protection

ASSOCIATION: Kaiser Engineers Hanford

EXPERIENCE: 19 years

- Kaiser Engineers Hanford
 - Senior Analytical Consultant, Fire Protection: Oversee compliance with rules, regulations, and guidelines on fire protection.
- Washington Public Power Supply System
 - Principal Fire Protection Engineer: Assured that fire protection programs met with the rules/regulations of the Nuclear Regulatory Commission and with special commitments made to Nuclear Regulatory Commission.
- Factory Mutual Systems, Dallas and Seattle Offices
 - District and Chief Engineer
 - Senior Loss Prevention Specialist
 - Responsible for the technical accuracy of work done to include Loss Prevention Reports, Fire Protection Plan reviews.
 - Supervised plan review for new construction, protection installations and special hazard projects.
 - Company-wide recognition as an expert in Loss Prevention in pulp and paper industry, utilities plants, large assembly plants and many other facilities.

EDUCATION: B.S., Civil Engineering, Montana State University

OTHER: Member: Society of Fire Protection Engineers, State of Washington Jail Commission on Fire Protection, State of Washington Fire Sprinkler Advisory Board, Professional Engineer, Fire Protection, State of Washington and Oregon

NAME: Joseph R. Enright

AREA OF RESP: Worker Safety and Health (OSHA) Compliance

ASSOCIATION: Oak Ridge Operations Office, Department of Energy

EXPERIENCE: 26 years

- Weldon Springs Site, U.S. Department of Energy, St. Charles, MO
 - Safety and Occupational Health Manager, Remedial Action Project: Provide advice to companies regarding their safety and health programs. Overview site for occupational safety and health compliance with DOE and OSHA regulations.
- Occupational Safety and Health Administration, St. Louis, MO
 - Safety and Occupational Health Specialist: Conducted general industry and construction inspections to ascertain compliance or non-compliance with OSHA regulations.

EDUCATION: M.S., Industrial Safety, Central Missouri State University
B.S., Trade and Industrial Education, Oklahoma State University
A.S., Fire Protection Technology, Oklahoma State University

OTHER: Certified Safety Professional

NAME: T. Guy Fortney, M.D.

AREA OF RESP: Medical Services

ASSOCIATION: Private Consultant

EXPERIENCE: 39 years

- Private Consultant
- Union Carbide Corporation
 - Corporate Medical Director (Danbury, CT), Assistant Corporate Medical Director (Indianapolis, IN)
 - Plant Medical Director/Staff Physician, Oak Ridge Gaseous Diffusion Plant
- Private Practice
 - Family Medicine, Oak Ridge, TN

EDUCATION: M.D., University of Louisville, Louisville, KY, 1947-1951
Pre-Med, Eastern Kentucky State University, Richmond, KY, 1947
Mini-Residency, Occupational Medicine, University of Cincinnati, Cincinnati, OH, June 1983, March 1984 and June 1985
Internship (Rotating), St. Joseph's Infirmary, Louisville, KY 1951-1952

OTHER: Licensed Physician, Tennessee and Kentucky
American College of Occupational Medicine
Tennessee College of Occupational Medicine
Tennessee State Medical Association
Resident, Roane/Anderson County Medical Society

NAME: Judith Foulke

AREA OF RESP: Radiation Protection

ASSOCIATION: Office of Health, Headquarters, Department of Energy

EXPERIENCE: 19 years

- U.S. Department of Energy, Washington, DC
 - Health Physicist: Responsible for implementation of radiation protection orders and development of performance standards.
- U.S. Nuclear Regulatory Commission
 - Radiobiologist, Office of Research: Project Manager for research contracts in areas of radiation biology, biology and health effects of radiation
 - Health Physicist, State Agreements Program: Review of state radiation control programs and technical assistance to states.
- NASA/Goddard Space Flight Center
 - Health Physicist: Radiation control for sealed sources, accelerators, and irradiators.

EDUCATION: Ph.D., Bionucleonics, Purdue University
M.S., Radiological Health, University of Michigan
B.A., Chemistry, St. Mary of the Springs College

OTHER: Member: American Association for the Advancement of Science, American Nuclear Society, Health Physics Society

NAME: Harry W. Heiselmann

AREA OF RESP: Maintenance

ASSOCIATION: SCIENTECH, Inc.

EXPERIENCE: 30 years

- U.S. Department of Energy Programs
 - Participated in more than 16 Technical Safety Appraisals and Tiger Teams at Hanford, Nevada, Idaho, Oak Ridge, Brookhaven, Mound, Livermore, Savannah River, and other sites.
 - Participated in the development, implementation, and utilization of maintenance programs; in the application of reliability and fault tree analyses; and in testing of electric vehicles.
- Nuclear Safety Programs
 - Participated in the LOFT and Semiscale nuclear safety testing programs
 - Participated in manufacturing, testing and maintenance of testing and research and development equipment
 - Participated in development and utilization of NQA-1 and Mil-Spec quality assurance programs
- Industrial and Commercial Projects
 - Design, analysis, testing, maintenance, quality assurance, and research for developmental and prototype equipment and facilities
 - Expertise in instrumentation and measurement systems, field support and test equipment, development of radiation monitoring systems, and test data acquisition and analysis

EDUCATION: B.S., Mechanical Engineering, Illinois Institute of Technology
Graduate courses, University of Idaho
Jet Propulsion Laboratory, U.S. Army Guided Missiles

OTHER: Member: American Society of Mechanical Engineers, Idaho Section Chairmam, American Nuclear Society, Symposium Finance Chairman, Registered Professional Engineer, Idaho and Illinois

NAME: Henry P. Himpler, Jr.

AREA OF RESP: Quality Verification

ASSOCIATION: SCIENTECH, Inc.

EXPERIENCE: 36 years

- Health & Safety Subteam Member - Mound, LLNL, ANL-E, ORNL, PPPL, and Hanford Tiger Team Assessments.
- TSA Team Member - N Reactor, Plutonium Finishing Plant, Hanford Tank Farm, NPR, SPR, Brookhaven National Laboratory, and HFIR.
- Quality Verification Inspection Team Member - Portsmouth, PADUCAH, ORNL, SP-100 and ANL-W.
- QA Audit Team Member - SR, SAN, HFBR (BNL) and ACRR (SNL).
- Nuclear Safety Program Appraisal Team Member - ORNL, RF and AL.
- Test and Evaluation Systems Engineering, Management and Design, Westinghouse Corp. and Raytheon Co.
- QA Project Engineer and Project Manager, Westinghouse and General Electric Co.
- Consultant to the U.S. Department of Energy in QA Program Planning and Auditing, ARINC Research Corp.
- Consultant to the U.S. Navy Weapon Systems/Project Management, Planning and Auditing, ARINC Research Corp.
- Electronic Systems Design Engineering, Westinghouse Corp.

EDUCATION: B.S., Electrical Engineering, Johns Hopkins University
B.S., Industrial Technology, Roger Williams College

NAME: Jack J. Janda

AREA OF RESP: Worker Safety and Health (OSHA) Compliance

ASSOCIATION: Comprehensive Environmental Health Services, Inc.

EXPERIENCE: 18 years

- Comprehensive Environmental Health Services, Inc.
 - Safety and health training
 - Phase I and II site assessments
 - Asbestos analysis
 - Onsite OSHA-type compliance inspections
 - Safety and industrial hygiene surveys
 - DOE Technical Safety Appraisals and Tiger Team Assessments
- Occupational Safety and Health Administration
 - Established regional enforcement goals, policies, and procedures
 - Directed industrial hygiene and safety compliance activities
 - Managed agency programs, supervised industrial hygienists and safety specialists, and team leader on major inspections
 - Expert witness
- Accident Prevention Laboratory, Institute of Agricultural Medicine
 - Accident investigations involving consumer products, flammable clothing and products, etc.

EDUCATION: M.S., Preventive Medicine and Environmental Health-emphasis in Industrial Hygiene, University of Iowa College of Medicine
B.S., General Science, University of Iowa

OTHER: Member: American Industrial Hygiene Association, American Conference of Governmental Industrial Hygienists, Certified Asbestos Hazard Emergency Response Act, Building Inspector and Asbestos Management Planner, Accredited U.S. Department of Labor/OSHA Instructor for Safety and Industrial Hygiene

NAME: Philip G. Kelley

AREA OF RESP: Explosives Safety

ASSOCIATION: Mason & Hanger-Silas Mason Co., Inc.

EXPERIENCE: 40 years

- Pantex Plant, Amarillo, TX
 - Safety Director: Manager of department responsible for Industrial, Occupational, Explosives, and Nuclear Weapons Safety Programs; Member of DOE Explosives Safety Committee which is responsible for development and publication of explosives safety standards for use throughout the DOE complex.
 - Senior Safety Engineer: Supervised the implementation of explosives safety quantity-distance standards at a DOE weapons production facility, conducted appraisal of production facility for compliance with DOE explosives safety standards, and prepared requests for exemptions and waivers to DOE explosives safety standards.
- U.S. Army (Colonel, Retired)
 - Chairman, DoD Explosives Safety Board: Responsible for developing explosives safety standards for the manufacture, storage, and transportation of ammunition and explosives throughout the DoD complex; conducted appraisals of the explosives safety programs of DoD Components.
 - Various command, operations, and staff positions involving the storage, security, use, and disposal of both conventional and nuclear ammunition and explosives.

EDUCATION: M.S., Public Administration, Southern Illinois University
B.S., Management, University of Maryland
U.S. Army Command and General Staff College Industrial College of the Armed Forces

NAME: O. Clinton Kolar

AREA OF RESP: Nuclear Criticality Safety

ASSOCIATION: M.H. Chew and Associates

EXPERIENCE: 40 years

- Private Consultant
 - Participant in three Technical Safety Appraisals (SRL, PGDP, and ORNL)
- Lawrence Livermore National Laboratory, Livermore, CA
 - Nuclear criticality safety: Responsible for nuclear criticality safety program at LLNL
 - Group leader of Livermore Plutonium Array Program with responsibility for providing technical and administrative direction on design, performance, and analysis of a series of experiments to determine critical spacings of arrays of plutonium parts
 - Assistant head of a division with responsibilities for administrative and technical supervision of physics personnel. Technical responsibilities were in reactor neutronic analysis, radiation effects, and shielding
- Lawrence Berkeley National Laboratory, Berkeley, CA
 - Conducted investigations of nuclear reaction mechanisms, magnetic field measurements, beam shielding, particle energy determination, accelerator field mapping

EDUCATION: Ph.D., Physics, University of California at Berkeley
B.A., Physics, University of California at Los Angeles

OTHER: Registered Professional Nuclear Engineer, State of California
Certified U.S. DOE Accident/Incident Investigator
Member: American Physical Society, American Nuclear Society, Sigma Xi, American Association of Physics Teachers, National Science Teachers Association
American Society of Safety Engineers

NAME: Joseph A. Leary

AREA OF RESP: Organization and Administration

ASSOCIATION: TRU Engineering Company, Inc.

EXPERIENCE: 46 years

- Served on Technical Safety Appraisals for Fernald, WMC0; Savannah River Plant, 221-h Canyon; Y-12 Plan (Bldgs. 9206 and 9212), Oak Ridge; and LLNL (Bldg. 332).
- Served on Tiger Team Assessments at Savannah River Laboratory, Westinghouse, Hanford-Purex Plant, and Westinghouse-Hanford Plutonium Finishing Plant.
- President, TRU Engineering Company, Inc.
- AEC/ERDA/DOE Headquarters Manager, National Advanced Fuels Program; Director, International Program; and Director, Fuels Management and Safeguards
- Scientist, Engineer and Manager of Nuclear Materials Programs, Los Alamos National Laboratory

EDUCATION: Ph.D., Chemistry, University of New Mexico
B.S., Chemical Engineering, Newark College of Engineering

NAME: Thomas A. Lincoln, M.D.

AREA OF RESP: Medical Services

ASSOCIATION: Private Consultant

EXPERIENCE: 40 years

- Oak Ridge Associated Universities, Oak Ridge, TN
 - Private consultant in occupational medicine
 - Director Occupational Medicine Support Group
- Union Carbide Corp.
 - Corporate Medical Director
- Oak Ridge National Laboratory
 - Medical Director
 - Staff Physician
- Clinical Professor Occupational Medicine, New York University, 1980-1986

EDUCATION: M.D., University of Minnesota
 B.S., University of Minnesota
 B.A., Macalester College

OTHER: Certified in Occupational Medicine, American Board of Preventive Medicine, 1963,
 Licensed Physician, TN and MN
 Member: A.M.A. Task Force on Nuclear Power, 1979-1980,
 Radiation Advisory Committee, Penn. Power & Light Co., 1988-1990, Chairman, Radiation Advisory Committee, Penn. Power & Light Co., 1990-present,
 Scientific Committee 37, National Council on Radiation, Protection and Measurements (NCRP), 1973-1980, Board of Directors, American Occupational Medical Association (AOMA), 1983-1986
 Secretary/Treasurer, Tennessee College of Occupational Medicine (TCOM), 1989-1991, President Elect, TCOM, 1991, Trustee, American Board of Preventive Medicine, 1986-1990

NAME: Thomas H. Lovatt

AREA OF RESP: Worker Safety and Health (OSHA Compliance)

ASSOCIATION: Kaiser Engineers Hanford

EXPERIENCE: 25 years

- General
 - Twenty-five years management of professional and volunteer groups in construction, industrial safety, and related fields. Instrumental in organizing safety programs for major construction projects including nuclear power plants and mining/tunnel projects. Served on Tiger Teams Argonne Illinois Site, Oak Ridge National Laboratory, and Lawrence Berkeley Laboratory. Assisted with pre-Tiger Team safety inspections at Lawrence Livermore Laboratory and Hanford Nuclear Facility.
- Kaiser Engineers Hanford/J.A. Jones Construction Services Co., Richland, WA
 - Responsible for management of company safety/radiation and hazardous waste management programs at the DOE Hanford Nuclear Facility.
- J.A. Jones Construction Company, Charlotte, NC/Ebasco Services, Inc., New York, NY
 - Safety Supervisor: Construction of Washington Public Power Supply System, Nuclear Plant Project Nos. 1, 3, 4 and 5; and Florida Power and Light Company, St. Lucie Nuclear Power Plant Construction Project Unit No. 2, St. Lucie County, FL
- Litton Industries, San Carlos, CA
 - Managed corporate safety programs
- Fluor Utah, Inc., San Mateo, CA
 - Safety Supervisor: Cordero Coal Mine Construction Project, Gillette WY, and The Mineral Creek Tunnel Construction Project, Kearny, AZ

EDUCATION: A.A., General Business Glendale Community College, Glendale, AZ
International Loss Control Institute, Atlanta, GA
Attended Occupational Safety and Health Training Institute (OSHA)

OTHER:

Member: American Society of Safety Engineers, National
Safety Council, National Fire Protection Association

NAME: James A. Martin, Jr.

AREA OF RESP: Emergency Preparedness

ASSOCIATION: Evergreen Innovations, Inc.

EXPERIENCE: 40 years

- U.S. Nuclear Regulatory Commission
 - Emergency planning and response
 - Accident consequences assessment
 - Health physics
 - Radiation protection
- U.S. Environmental Protection Agency
 - Developed and applied dispersion, dose, environmental contamination and health effects models for effluents and emissions from nuclear power plants
 - Participated in development of EPA Protective Action Guides
- Moleculon Research Corporation
 - Chemical research and development
 - Performed dosimetry in underground nuclear weapons tests
 - Radiation Safety Officer
- International Business Machines Corporation
 - Performed space and weapons radiation effects tests on electronic parts and systems
 - Assistant Radiation Safety Officer

EDUCATION: M.S., Physics, Temple University
B.S., Physics, University of Scranton

OTHER: Member: American Nuclear Society, Health Physics Society, Sigma Pi Sigma

NAME: Lewis S. Masson

AREA OF RESP: Maintenance

ASSOCIATION: SCIENTECH, Inc.

EXPERIENCE: 39 years

- SCIENTECH, Inc.
 - Senior Associate: provide technical assistance to DOE and U.S. Nuclear Regulatory Commission in the fields of mechanical and nuclear engineering.
 - Participant in Technical Safety Appraisals and Tiger Team Assessments.
- EG&G Idaho, Inc.
 - Technical support to Office of Defense Energy Projects.
 - Program Manager for the Fusion Engineering Program.
 - Division Manager for the Loss-of-Fluids (LOFT) Engineering Support Division.
- Aerojet Nuclear Company
 - Design Engineering Manager, Special Reactor Projects.
- General Electric Company
 - Manager, engineering activities for advanced nuclear propulsion systems.
 - Project engineer during recovery of the damaged SL-1 reactor at INEL.
 - Manager of test facilities and activities for Aircraft Nuclear Propulsion Program.

EDUCATION: M.S., Nuclear Engineering, University of Idaho
B.S., Mechanical Engineering, University of California, Berkeley

OTHER: Member: America Nuclear Society and Fusion Energy
Division Executive Committee

NAME: Leo H. Munson

AREA OF RESP: Radiation Protection

ASSOCIATION: Battelle Pacific Northwest Laboratory

EXPERIENCE: 36 years

- Battelle Pacific Northwest Laboratory
 - Provide project management
 - Evaluate and assess programs, equipment, systems and criteria
 - Develop upgrade programs and corrective actions in the health physics and radiation protection fields
- UNC Nuclear Industries, Richland, WA
 - Manager of Reactor Quality Assurance at a dual purpose reactor
 - Responsible for implementation of the company's industrial safety program and overview of the radiological safety program
- Donald W. Douglas Laboratories
 - Primarily responsible for health physics in the Radioisotope Laboratory including dosimetry, waste handling, shipping, and radiological control

EDUCATION: A.A., Radiation Technology, Columbia Basin College, Pasco, WA
Additional course work at Joint Center for Graduate Study, Richland, WA

OTHER: Certified, American Board of Health Physics, 1970, 1981, 1984, 1989

NAME: Linda F. Munson

AREA OF RESP: Radiation Protection

ASSOCIATION: Evergreen Innovations, Inc.

EXPERIENCE: 17 years

- Evergreen Innovation, Inc., President
 - Assisted Allied Signal Kansas City Plant in preparing a safety assessment report
 - Project manager to assist EPRI in preparation of a radwaste desk reference
 - Consultant to Battelle on cleanup of Three Mile Island
 - TSA and Tiger Team participant: Industrial Hygiene, Emergency Readiness, and Radiation Protection
- Battelle Pacific Northwest Laboratory
 - Associate Section Manager, Dosimetry Technology Section
 - Project Manager for various technical assistance programs of including cleanup of Three Mile Island and upgrade of the RMI, Inc. Health Physics program
 - Participated in the team appraisal of six uranium mills for and with the NRC
 - Appraised, with DOE, emergency preparedness of the Rocky Flats Plant
 - Observed about six emergency preparedness exercises for NRC
- UNC Nuclear Industries
 - Manager, Industrial Safety responsible for industrial safety and fire protection at N Reactor and the associated fuel fabrication facilities
 - Managed the preparation of Environmental Information Reports and license application for various nuclear facilities, primarily uranium mills, and fuel fabrication plants
 - Responsible for industrial hygiene at N-Reactor and the associated fuel fabrication facilities
 - Responsible for industrial safety and fire protection at N-Reactor and associated fuel fabrication facilities
 - Evaluated decontamination alternatives for the West Valley Reprocessing Plant

EDUCATION:

M.S., Analytical Chemistry, Iowa State University
B.A., Chemistry, United States International University
Short courses in Radiation Protection, Industrial
Hygiene, Industrial, Safety, MORT, Respiratory
Protection, Management, and Communication

NAME: William R. Murphy

AREA OF RESP: Workers Safety and Health (OSHA) Compliance

ASSOCIATION: Murphy & Associates

EXPERIENCE: 22 Years

- Lurgi Corporation
 - Director of Safety: Responsible for corporate and field operations safety programs.
- Exxon
 - Senior Safety Engineer (Special Assignment): Responsible to the President for all matters pertaining to safety, health and environment.
 - Safety Engineer: Site safety responsibilities for all research/laboratory/pilot plant and construction projects.
 - Safety Engineer (ESSO, Venezuela): Monitored, inspected and implemented project safety/health fire protection.
- Private Consultant
 - Conducted safety and health audits for major corporations
 - Conducted training of safety and health inspectors
 - Developed compliance guidance to Federal, state and local government
 - Acted as expert witness--construction, aviation and worker safety and health
 - Provided interpretation of OSHA regulations for Department of Labor, Environmental Protection Agency, and Department of Energy

EDUCATION: B.S., Safety Engineering/Management, Emory-Riddle University

OTHER: Executive Secretary, National Safety Council
Member: Systems Safety Society, American Society of Safety Engineers

NAME: Robert M. Osborn

AREA OF RESP: Worker Safety and Health (OSHA) Compliance

ASSOCIATION: Westinghouse Hanford Company

EXPERIENCE: 12 years

- Westinghouse Hanford Company
 - Senior Industrial Safety Engineer, Waste Tank Safety Assurance: Plan and perform OSHA compliance inspections, audits and appraisals. Provided first point of contact for DOE Tiger Team TSAs. Initiated an intensive machine guarding program to bring Hanford facilities into OSHA/ANSI compliance.
- United Nuclear Industries
 - Supervisor, Quality Audits: Implemented and maintained QA Audit Program for operating and maintenance activities. Performed audits to determine compliance with specified quality, safety, and environmental requirements.
- Puget Sound Naval Shipyard
 - Boilermaker: Held lead position for retubing and repair of shipboard boilers. Served as Test Director for hydrostatic testing of boilers and pressure vessels.

EDUCATION: Occupational Safety and Health, OSHA Training Institute
National Fire Protection Association, NFPA 101, Life Safety Code
DOE, Mort/AI QTRC, Effectiveness Performance-Based Verification
Practice and Process of Auditing, Rockwell
International Quality Assurance Management, Columbia Basin College

OTHER: Certified Auditor, American Society of Quality Control

NAME: David S. Penfield

AREA OF RESP: Industrial Hygiene

ASSOCIATION: Westinghouse Hanford Company

EXPERIENCE: 11 years

- Westinghouse Hanford Company, Richland, WA
 - Responsibilities include developing an industrial hygiene overview of facility design and operation; document review and approval; technical direction to management and work force; operational and occupational readiness review; regulatory compliance inspection; and program audit and appraisal.
 - Assignments also include Emergency Management Center Communicator; the development of a site wide respiratory protection manual; personnel protective requirements for work with bulk alkali metals and associated cyrogenics; review and establishment of fixed area monitoring equipment; safety and hygiene representative to the Fast Flux Test Facility.

EDUCATION: B.S., Industrial Hygiene, California State University

NAME: Robert L. Peterson

AREA OF RESP: Operations and Experimental Activities

ASSOCIATION: Viking Systems International

EXPERIENCE: 30 years

- Consultant
 - Participated in Technical Safety Appraisals in the area of Conduct of Operations and Experimental Activities
- General Electric (GEND), Largo, FL
 - Twenty-eight years: Manufacturing Engineering, Production Engineering, Manager Process Control Engineer, Manager Incoming Materials, Manager Quality Control Engineering, Manager Quality Control Operations, Manager, Quality Control and Consulting, Manager Compliance Programs (Preparation for Technical Safety Appraisals and Tiger Team Assessment), Manager Operational Surety.

EDUCATION: B.S., Industrial Engineering, University of Florida

OTHER: Registered Professional Engineer, FL, Certified Quality Engineer, Certified General Contractor, FL, American Society of Quality Control

NAME: Karen G. Rawlings

AREA OF RESP: Worker Safety and Health (OSHA) Compliance

ASSOCIATION: National BioSystems, Inc.

EXPERIENCE: 3 Years

- National BioSystems, Inc.
 - Industrial Hygiene Sampling Specialist
 - Safety Inspections Specialist
 - OSHA Standards Specialist and research appropriate OSHA standard violations
 - Developed OSHA-modified 1Bs and report forms/formats
 - Participated in Oak Ridge National Laboratory, Lawrence Berkeley Laboratory, and Sandia National Laboratories Tiger Team Technical Safety Appraisals
- Campbell Communications, Inc.
 - Responsibilities included research and analysis of market survey data and development of final reports

EDUCATION: Coursework in Management, Montgomery College, Germantown, MD

NAME: Stephen H. Seger

AREA OF RESP: Worker Safety and Health (OSHA) Compliance

ASSOCIATION: Kaiser Engineers Hanford Company

EXPERIENCE: 16 years

- Kaiser Engineers Hanford Company
 - Field Safety Representative I: Responsible for implementing, coordinating, and maintaining safety and health protection programs. Conducts inspections of Kaiser Engineers Hanford operations to ensure compliance with codes, standards, and regulations; conducts/reviews accident investigations, analyzes causes, and formulates recommendations for corrective action. Specializes in heavy hoisting and rigging operations, machine guarding and accident investigation. Assisted with pre-Tiger Team OSHA compliance inspections at the Hanford Reservation and Los Alamos National Laboratory.

EDUCATION: Criminal Law/Police Science, Columbia Basin College
Environmental Laws and Regulations, Tri-Cities
University of Washington Branch
OSHA Training Center - Machine Guarding Standards
Mobile and Overhead Crane Inspection and Rigging
Considerations, Crane Inspection Certification Bureau

OTHER: Member: American Society of Safety Engineers,
Washington Pilots Association, International Union of
Operating Engineers, Washington State Marine Law
Enforcement Officers Association, Washington State
Reserve Law Enforcement Officers Association

NAME: Richard J. Serbu

AREA OF RESP: FH Senior Manager

ASSOCIATION: Office of Safety Appraisals, Headquarters, Department
of Energy

EXPERIENCE: 24 years

- U.S. Department of Energy, Washington, DC
 - Acting Director, Safety Inspections Division, EH-331
 - Acting Director, Safety Technology Division, EH-332
 - Team Leader for Technical Safety Appraisals
- Tennessee Valley Authority, Chattanooga, TN
 - Corporate Health Physicist for TVA's Office of Nuclear Power
 - TVA Central Emergency Response Team
- U.S. Nuclear Regulatory Commission, Rockville, MD
 - Health Physicist: Technical reviewer for radiation protection and emergency preparedness for licensing and design changes for reactors, prepared safety evaluation reports, performed inspections and team evaluations, evaluated reactor emergency preparedness exercises
 - Task Manager for NRC/INPO Coordination Plan for Radiological Protection Activities
 - Contracts Project Manager for work with DOE Labs
 - NRC Incident Response Team
- General Electric, Schenectady, NY
 - Knolls Atomic Power Lab., Kesselring Site
 - Manager, Radiological Monitoring
 - Lead Engineer, Dosimetry and Health Physics
 - Lead Engineer, Radiological Training
 - Radiological Controls Shift Supervisor
 - Instructor, Chemistry and Radiological Controls, qualified as nuclear navy Engineering Laboratory Technician
 - Kesselring Emergency Response Team
- U.S. Air Force
 - Officer, Pilot/Aircraft Commander
 - Standardization/evaluation aircrew member

EDUCATION: B.A., Chemistry, State University College at Potsdam,

NY

OTHER:

Member: Health Physics Society

NAME: Frank D. Stump

AREA OF RESP: Worker Safety and Health (OSHA) Compliance

ASSOCIATION: EG&G Idaho, Inc.

EXPERIENCE: 27 years

- Industrial Safety, Industrial Hygiene, and Health Physics positions with EG&G Idaho, Inc., and predecessor companies, which served as prime contractor at the Idaho National Engineering Laboratory (INEL).
- Functions as the Engineering Department's Safety Review Office Coordinator. Determines safety compliance to requirements of DOE and ID Orders and other applicable codes, standards, and regulations.
- Safety representative at a multidisciplinary research center supporting nuclear and other energy-related programs, conducting research in materials science, physical sciences, chemistry, biotechnology, environmental sciences, and electronic development.

EDUCATION: B.S., Automotive Technology, Utah State University
Certificate of Proficiency, Health Physics, University of Idaho
Certificate of Proficiency, Industrial Safety, University of Idaho

OTHER: Certified Safety Professional
Certified Occupational Health and Safety Technologist

Member: American Society of Safety Engineers

NAME: Roland Swanson

AREA OF RESP: Firearms Safety

ASSOCIATION: Private Consultant

EXPERIENCE: 26 years

- Private Consultant
 - Select Organizations and Administrative Resource Services (SOARS). Investigations, criminal justice consultant, and firearms trainer for State of New Mexico, Satellite Training Program.
- Wachenhut Services, Inc.
 - Central Training Academy Rangemaster. Formulated the Firearms Instructor Training Program and participated in the development of DOE 5480.16, "Firearms Safety."
- Federal Bureau of Investigation
 - Supervisory Special Agent; Field Agent; Firearms/Tactical Instructor Supervisor; FBI Academy, Quantico, Virginia

EDUCATION: B.S., Business Administration, Carthage College, IL

NAME: Patrick Tran

AREA OF RESP: Firearms Safety

ASSOCIATION: Office of Quality and Safety Programs, Headquarters,
Department of Energy

EXPERIENCE: 3 years

- U.S. Department of Energy, Washington, DC
 - Headquarters, DOE, intern training programs in environment, safety and health.
 - Firearms Safety Program Manager: Member of all firearms safety appraisals conducted by the Office of Quality and Safety Programs since mid-1989.
 - Pressure Safety Program Manager: As Headquarters, DOE coordinator, manage the Pressure Safety Training Program provided by Lawrence Livermore National Laboratory.

EDUCATION: B.S., Electrical Engineering, University of Maryland

OTHER: Member: Institute of Electronic Electrical Engineering, Tau Beta Pi Honor Society, University of Maryland

NAME: Thomas L. Van Witbeck

AREA OF RESP: Operations and Experimental Activities

ASSOCIATION: TOMA Enterprises

EXPERIENCE: 30 years

- TOMA Enterprises
 - General Manager: Provide services to Government and commercial nuclear industry in the areas of management operations, maintenance, and safety.
- SCIENTECH, Inc.
 - Provide project management and technical consulting services to Government agencies and the utility industry.
- Energy Incorporated
 - Vice President: Provided maintenance management systems and technical support, plant operations and quality assurance services
 - Director: Provided technical support services; and conducted management and quality assurance audits of nuclear facilities
 - Group Manager/Principal Consultant: Provided technical support of commercial nuclear power stations and DOE nuclear facilities; member of onsite team to assess the Three-Mile Island accident
- Westinghouse Electric Corporation
 - Shift Supervisor/Supervisory Engineer: commercial nuclear reactors and DOE facilities and programs
- Oregon State University, Reactor operator and health physicist
- U.S. Navy
 - Petty Officer in charge of water chemistry and radiological programs aboard USS Bainbridge DLGN25
 - Instructor, U.S. Navy Nuclear Power School

EDUCATION: B.S., Nuclear Engineering, Oregon State University

Management Development Program, Northeastern University
U.S. Navy Engineering Laboratory Technician School
U.S. Navy Nuclear Power School

OTHER:

Registered Professional Engineer
Licensed Reactor Operator (OP-2315)

NAME: Larry D. Warren
AREA OF RESP: Technical Editor
ASSOCIATION: Private Consultant
EXPERIENCE: 26 years

- Private Consultant
 - Technical and management consulting related to nuclear weapons research and development, nuclear weapons manufacturing facilities operations, and nuclear facilities safety programs. Participant in Technical Safety Appraisals (TSAs), Tiger Team Assessments (TTAs), and management appraisals/reviews.
- U.S. Department of Energy, Washington, DC
 - Safety Programs Manager, Office of Weapons Safety and Operations, Deputy Assistant Secretary for Military Application, Defense Programs: Formulated safety and health policy and long-range plans for three national laboratories and five manufacturing facilities in the nuclear weapons complex. TSA coordinator/contact and Program Representative on 11 TSAs.
- Wilmington District, U.S. Army Corps of Engineers, Wilmington, NC
 - Deputy Commander: Managed/directed annual planning/execution of \$60-70 million in civil works projects and \$9-15 million in military construction projects; Contracting Officer for construction and service contracts.
- Los Alamos National Laboratory, Los Alamos, NM
 - Program Manager, Insertible Nuclear Component Technology Program and Corps Support Weapons System Concept Study; Design Engineer, Nuclear weapon components and subsystems.
- U.S. Army (Lieutenant Colonel, Retired)
 - Various command, operations, and training assignments; and nuclear weapons research and development staff assignments.

EDUCATION:

M.S., Nuclear Engineering, N. C. State University
B.S., Nuclear Engineering, N. C. State University
U.S. Army Command and General Staff College

OTHER:

Member: Society of American Military Engineers

NAME: Stephanie G. West

AREA OF RESP: Coordinator

ASSOCIATION: Westinghouse Materials Company of Ohio

EXPERIENCE: 17 years

- Westinghouse Materials Company of Ohio, Fernald, OH
 - Senior Secretary to Manager, Environmental Compliance and Quality Assurance
 - Appraisal Coordinator for technical safety appraisals associated with the Savannah River Site Tiger Team Assessment in March 1990, and the Hanford Site Tiger Team Assessment in June 1990.
 - Coordinated Westinghouse Oversight Committee's Meeting in March 1990 and served as member of Health & Fitness Task Team and Steering Committee.
 - Co-Chairman for Tour Route Open House 1990. This entailed developing tour script, helping with introduction videos, training tour bus escorts and speakers, making presentations to bus company and DOE site office, and was troubleshooter on the day of event.
 - Word Processor for TSAs from 1986-1988. Assigned as Headquarters, DOE Appraisal Coordinator in 1989. Interacted with DOE personnel as Word Processing Coordinator for Headquarters, DOE Health Physics Appraisal and Technical Safety Appraisal at the FMPC.
 - Served as primary member of emergency operations staff at Fernald and primary participant in "Joint Response 1988."
 - Secretary to DOE Site Manager and on special assignments.

EDUCATION: Miami University, Hamilton Br. - Accounting I
Secretarial Grid - Oxford, OH
Proof-a-Matics Instructor

Appendix A-4

Management Subteam Members

NAME: Jane L. Monhart

AREA OF RESP: Management Subteam Leader

ASSOCIATION: Acting Manager, Brookhaven Area Office
Chicago Operations Office
U.S. Department of Energy

EXPERIENCE: 21 Years

- Currently responsible for the planning, management, and direction of activities relating to the administration of the contract between DOE and Associated Universities, Inc., for the operation of Brookhaven National Laboratory (BNL). This includes providing Contracting Officer direction and decisions; providing operational oversight of BNL facilities; implementing Nuclear Energy programs; and representing DOE before state and local governments and other federal agencies.
- Served as Deputy Manager of the Brookhaven Area Office for three years.
- Served as Director, Policy and Analysis Division, at the Chicago Operations Office (CH) for four years. Responsibilities included providing CH staff with procurement policy implementation guidance, chairing CH's Contract Review Board, serving as the CH Competition Advocate, managing the CH procurement data base, and managing the procurement appraisal program. Also participated with DOE Headquarters and other DOE Field Offices in the development of DOE-wide policy.
- Supervisor and Contracting Officer for eight years. Responsibilities included the negotiation and administration of all types of contracts and assistance agreements in support of DOE's R&D programs. Also chaired source evaluation boards and panels.

EDUCATION: B.A., Political Science, University of Illinois
M.A., Public Administration, University of Illinois

NAME: Patricia L. Davidson

AREA OF RESP: Coordinator

ASSOCIATION: U.S. Department of Energy, Headquarters

EXPERIENCE: 18 Years

- U.S. Department of Energy
 - Appraisal Specialist, Office of Safety Appraisals. Responsible for assisting the Tiger Team Administrator with planning and coordination as senior coordinator on DOE Tiger Teams. Responsible for planning, scheduling, organizing, conducting, and participating in management, safety, health, and quality assurance appraisals, and Technical Safety Appraisals of DOE Field Offices and operating facilities. Assist in producing a final document following appraisals.
- Oak Ridge Associated Universities
 - Appraisal Coordinator. Provided coordination activities for DOE in Design Reviews, special appraisals, and Technical Safety Appraisals of DOE Field Offices and individual operating contractor facilities. Coordinated pre-appraisal arrangements, such as assistance to TAPSHQA Program Manager in communicating with roster members regarding assignments, schedules, clearances, and reservation arrangements with respect to upcoming appraisals.
- AiResearch Manufacturing Company
 - Administrative Engineering Assistant. Coordinated the processing of important engineering documents exercising personal responsibility for their accuracy.
- Union Carbide Corporation
 - Data Processor and Reprint/Page Charge Clerk, Oak Ridge National Laboratory.

EDUCATION: Numerous work-related courses. Knoxville Business College. Roane State Community College.

NAME: Paul A. Gottlieb

AREA OF RESP: Management Assessment

ASSOCIATION: Chief Intellectual Property Counsel
Chicago Operations Office
U.S. Department of Energy

EXPERIENCE: 19 Years

- U.S. Government Service
 - U.S. Atomic Energy Commission, U.S. Energy Research and Development Administration, U.S. Department of Energy, 1972-Present -- Office of Patent Counsel (now Office of Intellectual Property Counsel) -- Chief since 1989: Serving Chicago Operations Office and its area offices at Brookhaven, Princeton, Batavia, and Argonne; Idaho Operations Office; Pittsburgh Energy Technology Center; SERI Area Office; Bartlesville Project Office; and the SSC Project Office. Participant in annual laboratory institutional appraisal programs and contractor procurement system reviews. Represents the U.S. Government before the U.S. Patent and Trademark Office.

EDUCATION: B.S.E. (E.E.), Duke University
J.D., Duke University

OTHER: Received numerous outstanding performance awards. DOE Tech Transfer Field Task Force -- Chairman of the Philosophy of Operations Team, and Deputy Chairman of the Other Facilities Team representing the views of M&O contractors and DOE Field Organizations.

NAME: Roger Griebe

AREA OF RESP: Management Assessment

ASSOCIATION: Organizational Analysis Corporation

EXPERIENCE: 27 Years

- Provide strategic and tactical business planning, organizational development, and associated management consulting services to commercial industry and DOE.
- Participated on Tiger Team assessments and technical safety appraisals of Hanford, Savannah River Waste Management Facilities and Production Reactors, ATR, Portsmouth and Paducah, Oak Ridge National Laboratory, and others.
- Assisted in the development of the first management assessment methodology for DOE used at ORNL HFIR; assisted in upgrades and improvements to the Technical Safety Appraisal Methodology Document; developed a position paper for DOE on Age-Related Degradation at DOE Facilities.
- Continuing member of offsite safety review committees at Three Mile Island and Trojan nuclear power plants.
- Participated in the development and management of a technical consulting company including national and international market/organizational development functions and research and development activities.
- Technical contributor to reactor safety research and development projects for the federal government and private industry, operations and maintenance programs, methodology development and applications, large mainframe computer code development, and applications for reactor safety and operating transient simulations.

EDUCATION: B.S., Mechanical Engineering, Purdue University
M.S., Mechanical Engineering, Purdue University
PhD., Purdue University
Senior Executive Program, Stanford University

NAME: Marvin J. Laster, Esq.

AREA OF RESP: Management Assessment

ASSOCIATION: Private Consultant

EXPERIENCE: 32 Years

- Private consulting in environmental and safety law, management, and organization.
 - Participated in Tiger Team assessments of Lawrence Livermore National Laboratory, Paducah Gaseous Diffusion Plant, Oak Ridge National Laboratory, Lawrence Berkeley National Laboratory, Energy Technology Engineering Center, and Sandia National Laboratories, as a member of the management subteam.
 - Participated in the DOE Headquarters Task Force to develop Management Performance Objectives and Criteria for use in Tiger Team assessments.
- U.S. Government Service
 - U.S. Atomic Energy Commission, U.S. Energy Research and Development Administration, U.S. Department of Energy, 1958-1989 -- Office of General Counsel -- Assistant Chief Counsel: Chicago Operations Office; Brookhaven Area Office; Princeton Area Office, New York Support Office, Environmental Measurements Laboratory; Member, Accident Investigation Boards; Participant in annual laboratory institutional appraisals; Represented U.S. Government in litigation, claims, and disputes.

EDUCATION: B.A., Political Science, Brooklyn College
LL.B., New York University School of Law
Princeton Fellow, Public and International Affairs,
Princeton University

OTHER: Recipient, numerous Federal government sustained superior performance awards.

NAME: Denise Mershon

AREA OF RESP: Management Assessment - Management Intern

ASSOCIATION: Department of Energy, Office of Special Projects

EXPERIENCE: 2 Years

- Management Intern, Office of Special Projects (EH-5)
 - Responsible for the implementation and coordination of the Cost Plus Award Fee process for the Office of the Assistant Secretary for Environment, Safety, and Health.
 - Developed a comprehensive trend analysis of 16 DOE Facilities.
- Management Intern, Western Area Power Administration
 - Analyzed Power Repayment Studies and Rate Orders.
 - Participated in Coordination of major rule making process.
 - Developed training aids for power marketing division.

EDUCATION: B.B.A., Business Administration -- Economics and Human Resources, New Mexico State University

NAME: Judith M. Penry

AREA OF RESP: Management Assessment

ASSOCIATION: Oak Ridge Operations Office
U.S. Department of Energy

EXPERIENCE: 16 Years

- Budget Analyst -- Budget Division, Oak Ridge Operations Office.
- Director -- Planning and Budget Division, Oak Ridge Operations Office.
- Assistant Manager -- Financial Management, Oak Ridge Operations Office. (5 month detail)
- Team Leader -- Development of ES&H Long-Range Plan.
- Various assignments involving review of Martin Marietta management systems; startup of Fernald Site Office; and Type B Investigation for cesium release.

EDUCATION: B.A., Mathematics, Maryville College
M.B.A., Finance, University of Tennessee

NAME: Louis A. Rancitelli

AREA OF RESP: Management Assessment

ASSOCIATION: Battelle, Energy Systems Group

EXPERIENCE: 24 Years

- Battelle

- Participated in Tiger Team assessments of Lawrence Livermore National Laboratory, Paducah Gaseous Diffusion Plant, Lawrence Berkeley Laboratory, and Energy Technology Engineering Center as a member of the management subteams.
- Participated in Task Force for DOE Headquarters to develop Management Performance Objectives and Criteria for use in Tiger Team management assessments, June 1990.
- Managed the Battelle West Jefferson, Ohio Nuclear Facility. Responsible for compliance with DOE Nuclear Regulatory Commission (NRC) regulations related to nuclear materials storage, handling and transportation, waste characterization and disposal, criticality safety, and health physics.
- Conducted and managed studies related to the environmental impact of radionuclides resulting from commercial and defense reactor operations and nuclear weapons fallout.
- Conducted and managed programs to define the environmental impact of toxic trace metals resulting from fossil fuel combustion and industrial operations.
- Conducted and managed systems studies of fuel cycle wastes and disposal in various geological media.
- Managed for the NRC a uranium mine tailing study focused at defining the environmental impact.
- Managed an NRC program to define the emission, transport, and deposition of radionuclides from a low level radioactive waste site.

EDUCATION: B.S., Chemical Engineering, Drexel Institute of Technology
PhD., Nuclear Science and Engineering, Cornell University

NAME: David Schweller

AREA OF RESP: Management Assessment

ASSOCIATION: DBS Associates, Inc. -- Private Consultant

EXPERIENCE: 36 Years

- Four years -- President, DBS Associates, Inc., private consultants in organization, management, safety, and security.
- Participated in 21 previous Tiger Team and technical safety appraisals, nine as a member of the management subteam, including the first Tiger Team.
- Member of the Working Group to review the TSA program under the Assistant Secretary for Environment, Safety and Health.
- Safety Advisor for DOE Safeguards and Security Inspection and Evaluation Teams.
- Evaluator for FEMA Nuclear Utility Emergency Drills.
- Ten years -- Manager and Contracting Officer, DOE Brookhaven Area Office, Upton, NY.
- Fourteen years -- Director, Safety Division, DOE Brookhaven Area Office, Upton, NY.
- One year -- Reactor Safety Specialist, U.S. AEC, Washington, D.C.
- Two years -- Chief, Experimental Physics, Martin Nuclear Division, Middle River, MD. Designed, built, and operated three zero powered experimental reactor facilities.
- Five years -- Reactor Physicist, Combustion Engineering Nuclear Division, Windsor, CT. Designed, built, and operated three zero powered experimental reactor facilities.

EDUCATION: B.S., Engineering Physics, N.Y.U. College of Engineering

Appendix B

Environmental Subteam Assessment Plan

Table of Contents

1.0	Introduction	1
2.0	Environmental Assessment Implementation	2
2.1	Pre-Assessment Activities	2
2.2	On-Site Activities and Reports	3
3.0	Air	4
3.1	Issue Identification	4
3.2	Additional Records Required	5
4.0	Surface Water/Drinking Water	7
4.1	Issue Identification	7
4.2	Additional Records Required	8
5.0	Groundwater/Soil/Sediment/Biota	10
5.1	Issue Identification	10
5.2	Additional Records Required	11
6.0	Waste Management	12
6.1	Issue Identification	13
6.2	Additional Records Required	14
7.0	Toxic and Chemical Materials	15
7.1	Issue Identification	15
7.2	Additional Records Required	16
8.0	Radiation	18
8.1	Issue Identification	18
8.2	Additional Records Required	20
9.0	Quality Assurance	21
9.1	Issue Identification	21
9.2	Additional Records Required	22
10.0	Inactive Waste Sites	24
10.1	Issue Identification	24
10.2	Additional Records Required	25

1.0 Introduction

On June 27, 1989, Secretary of Energy, Admiral James D. Watkins, USN (Ret.), announced a 10-point initiative to strengthen environmental protection and waste management activities in the U.S. Department of Energy (DOE). One of the initiatives involves conducting Tiger Team Assessments at DOE's operating facilities.

The purpose of the environmental assessment portion of the Tiger Team Assessment of the Sandia National Laboratory-Albuquerque (SNLA) is to provide the Secretary with information on the current environmental regulatory compliance status and associated vulnerabilities of the facility, root causes for noncompliance, adequacy of DOE and site contractor environmental management problems, and response actions to address the identified problem areas.

The scope of the SNLA environmental assessment is comprehensive, covering all environmental media and applicable Federal, State, and local regulations, DOE requirements, and best management practices. The environmental disciplines to be addressed in this assessment include air, soil, surface water, hydrogeology, waste management, toxic and chemical materials, radiation, quality assurance, and inactive waste sites. The assessment also addresses National Environmental Policy Act (NEPA) requirements.

2.0 Environmental Assessment Implementation

The environmental assessment of SNLA will be conducted by a Team managed by a Team Leader and Assistant Team Leader from the Office of Environmental Audit (OEV), an Assistant Team Leader from the Office of Special Projects, other DOE offices, Arthur D. Little, Inc. (ADL), and Vertechs Corporation. The names and responsibilities are listed below:

Donna Bergman	DOE	Team Leader
Al Sikri	DOE	Assistant Team Leader
Marc Jones	DOE	Assistant Team Leader
Martha Curran	ADL	Group Coordinator
William Rhodes	ADL	Deputy Group Coordinator
James Daniels	DOE	NEPA Subteam Leader
Stuart Canton	ADL	Waste Management
Richard Hubbell	ADL	Air
James Melloni	ADL	QA
Margaret Miller	ADL	Toxic and Chemical Materials
Andrew Smyth	ADL	Groundwater/Soil
James Stevens	ADL	Inactive Waste Sites
Janet Stevens	ADL	Surface Water
Steve Masciulli	Vertechs	Radiation

2.1 Pre-Assessment Activities

Pre-Assessment activities for SNLA environmental assessment included the issuance of an introduction and information request memorandum, a Pre-Assessment Site visit, and an initial review of documentation which was sent to the environmental team by SNLA as a result of the information request memorandum.

A Pre-Assessment Site visit was conducted on March 19-21, 1991, by the Tiger Team Leader, Management Team Leader, Team Leaders for Environment, and Safety and Health, and the ADL Group Coordinator and Deputy Group Coordinator. The purpose of the Pre-Assessment visit was to become familiar with the site, to review information being supplied and request additional information, and to coordinate plans for the upcoming Assessment with the Albuquerque Operations Office, Kirtland Area Office, and SNLA personnel.

This Environmental Assessment Plan is based upon the information received by the Environmental Team as of April 2, 1991.

2.2 On-Site Activities and Reports

The on-site activities for the environmental assessment will take place from April 15 through May 24, 1991. On-site activities will include field investigations, file/record reviews, and interviews with site personnel. The preliminary schedule for the assessment is shown in the attached agenda. Any and all modifications to the agenda will be coordinated with the principal contacts from the Albuquerque Operations Office, Kirtland Area Office, and SNLA.

A close-out briefing will be conducted at the conclusion of the on-site activities. Findings from the Environmental Assessment, as well as findings from the Safety and Health, and Management Assessments will be presented. A draft report containing the findings will be provided for review and comment to the Office of Energy Research, the Albuquerque Operations Office, Kirtland Area Office, and SNLA.

3.0 Air

The air-related portion of the environmental assessment at SNLA will include a review of activities that emit or have a potential to emit one or more air contaminants, the emission controls or administrative procedures applied to restrict those emissions, the in-stack emission monitoring systems, and ambient-air monitoring equipment and procedures. The assessment will address those air contaminants for which air-quality standards (criteria pollutants) or emission standards (new source performance standards or emission standards for hazardous air pollutants) have been established by the United States Environmental Protection Agency or by New Mexico or local agencies. The City of Albuquerque has authority to regulate air emissions at SNLA, and therefore particular attention will be given to those regulations. Emissions to the atmosphere of organics through process vents and equipment leaks from hazardous waste TSDF that require permits under subtitle C of RCRA will be assessed. Compliance with DOE Orders and guidelines will also be assessed. Close liaison will be maintained with the team radiation specialist because of the importance of air-radiation issues.

3.1 Issue Identification

The general approach to the assessment will include a review of existing air permits, (open burn permits, NESHAP radionuclides) pending applications, and standard operating procedures. Processes and control equipment will be inspected for compliance with DOE ALARA requirements for radionuclide emissions. The assessment will also review the nonradiological air contaminants from the different buildings at the site, and evaluate any existing controls applied to the air emissions.

The current status of and future plans for an ambient air monitoring program, including a meteorological monitoring system, will be evaluated to assess its ability to characterize environmental impacts of air emissions from the facility. The activities involved in this part of the assessment will include the inspection of the current environmental sampling, a review of documentation, and calculations used for justifying current practices.

Areas of particular interest will include emissions of the criteria pollutants (e.g., particulates, sulfur oxides, nitrogen oxides, volatile organic compounds, carbon monoxide and lead) from the steam plant and emergency power facilities. Regulated hazardous air pollutants (e.g., radionuclides and beryllium) from the toxic machine shop and the Particle Beam Fusion Accelerator will be examined.

The use of organic solvents in the plastics shop, and various vapor degreasers will be assessed as a potential or actual source of emissions to determine if they are adequately characterized, monitored, and controlled.

An asbestos survey of SNLA buildings has begun. Information will be requested during the on-site phase of the assessment, and any records pertaining to the handling and disposal of asbestos and notification to EPA will be reviewed. Any on-going asbestos removal projects and/or disposal of asbestos on-site will be observed directly.

Fugitive emissions from the resuspension of contaminated soils will be evaluated as a potential means of the airborne release of hazardous materials from the chemical waste

landfill. Consideration will be given to historical and current operations to determine the potential for soil contamination and windborne releases.

Several areas of specific interest have been identified during a review of available documentation:

- Sources of Contaminant Emissions
 - Vapor degreasers (at several locations)
 - Machining operations (toxic and conventional metals)
 - Radionuclide release sources (Area IV, Area 1, Bldg. 869, 828, 867)
 - Fuel storage facilities, (Areas III, IV, V)
 - Chemical process facilities (Area 1)
 - Paint spray booths (Area 1)
 - Gasoline dispensing facilities (multiple locations)
 - Solvent dispensing facilities (Bldg. 834)
 - Hazardous materials storage facilities (Area 1)
 - Open burning (Thermal Treatment Facility, GE and Allied Signal Tests)
 - Albuquerque Microelectronics Operation processes (Area 1)
 - Ross Aviation
- Emissions Controls
 - Gas fired steam plant (Area 1)
 - Emergency power generators (Area 1)
 - HEPA filter systems (Bldg. 869, 840)
- Effluent Monitors/Sampling
- Ambient air Monitoring for Beryllium
- Meteorological Monitoring and AIRDOS Modeling

3.2 Additional Records Required

Files will be reviewed as part of the assessment, including documents not yet reviewed or received (e.g., classified documents, individual files, documents not yet identified). Specific documents and files to be reviewed as part of the assessment include, but will not be limited to, the following:

- Prior and current inventory of emission sources and quantification of emissions provided to the city of Albuquerque;
- Pending air permits;
- Air effluent sampling and QA policy and procedures;
- Ambient air sampling and QA policy and procedures;

- Contractor stack test results;
- Effluent beryllium sampling results and test procedures;
- Correspondence with the Albuquerque/Bernalillo County Air Quality Control Board;
- Reports on accidental releases of air contaminants;
- Asbestos-removal documentation including notifications to EPA;
- Notices of violation for air sources;
- City/county air quality control regulations.

4.0 Surface Water/Drinking Water

The focus of the surface water/drinking water portion of this assessment will be the release of waste water to the sanitary sewer system in Technical Areas I and IV and discharges to septic tanks from Technical Areas II, III, and V. In addition, the assessment will also address storm water runoff/drainage and collection, and spill prevention control and countermeasures (SPCC) activities. Drinking water standards will also be included in this assessment. These activities will be assessed relative to their compliance with federal, state, and local regulations, as well as with DOE Orders and guidelines.

4.1 Issue Identification

The release of chemicals occurs from the photography laboratories, the plating shop, ceramic shop, steam plant, and other generators in Technical Area I. Many of these chemicals are disposed of in the sanitary sewers. This has resulted, in some cases, in toxic pollutants in the sludge from the treatment plants. There are also chemicals released directly from Technical Area IV to the sewer system for the City of Albuquerque. There has been a prior release of radionuclides to the sewer system and the POTW.

There are chemical wastes in Technical Areas II, III, and V (such as photography and chemistry laboratories) which are released, in some cases, to septic tanks. There is also a report of release of radionuclides in waste water on the soil in Technical Area V. There appears to be no program in place to monitor the discharges from the septic tanks.

The site has just recently (November 1990) prepared the Spill Prevention, Control and Countermeasure Plan. There are tank farms on the facility and above ground storage tanks that have not been properly diked or have not had other spill containment measures implemented. The implementation of the inspection and reporting requirements of the plan will be examined.

It appears that the site has not taken steps to prepare for compliance with the new storm water discharge regulations. There are also reports of collection of storm water in sunken burial pits and other areas which may increase the hydrostatic head and result in enhanced migration to ground water.

While the facility receives its primary drinking water from KAFB, there are some back-up wells on the site which require monitoring and analysis. There also are issues with the maintenance and inspection of back flow protectors.

Of general concern is the overall lack of a program and procedures to notify the responsible division(s) concerning changes in processes or other activities that may impact on waste water. While there are some procedures concerning the handling of wastes and disposal of wastes in water, the availability of personnel to provide assistance and monitor this area appears to be inadequate.

The assessment will be conducted using a combination of the following:

- Record reviews, e.g., NPDES permits, analysis reports, sewer maps, maintenance records, SOPs, training records;
- Walk throughs of the areas/buildings where significant generation of releases are likely to occur, e.g., the photography laboratories which are reported to be disposing of photographic chemicals down the laboratory drains, cooling tower, plating and coating operations;
- Discussions with individuals in the different buildings as part of the walk throughs;
- Survey of land areas for outfalls, both to validate those identified and determine if any have been omitted that should have been included; this will also include surveys of remote areas, the arroyos where stormwater drains, the oil tank storage area (for SPCC), etc;
- Observation of activities, including the collection and transport of samples required for analysis, maintenance work, processes generating the waste water streams; and
- Interviews of managers of facilities generating waste water and with operators of treatment facilities and monitoring programs.

4.2 Additional Records Required

Documentation required by regulations, DOE Orders, and Operation Office procedures as well as site contractor policies and procedures will be reviewed as part of the assessment. Specific documents located in files and operational areas to be reviewed as part of the assessment include those received as well as those not yet received or reviewed. Additional documents required for this assessment include the following:

- Renewal applications for NPDES discharge permits;
- Reports required by the permits/regulations both on a regular, specified basis as well as exception reporting, such as for discharge limit exceedances;
- Sources of and records on quality of drinking water;
- Description and drawings of the pretreatment facility;
- Layout drawing of all sewers, locations of septic tanks, sampling locations, etc.;
- Installation drawings for water supply, storage, and distribution systems;
- Inventory of and locations (preferably on a map) of above ground storage tanks;
- Procedures for sampling and analysis of water and records of the analyses;

- Maintenance and calibration procedures for control and monitoring equipment pertaining to water;
- SOPs for waste water collection, handling, treatment and discharge;
- Operational logbooks and monitoring records from such areas as the pretreatment area, and steam plant;
- SPCC inspection records, required reports, etc.;
- Maintenance and inspection records for the drinking water supply system;
- Descriptions of processes that are waste water generators;
- Discharge plans for lagoons in Technical Area IV;
- Any memoranda of agreement between SNLA and KAFB relating to water and/or sewage issues;
- Internal memoranda relating to surface and/or drinking water issues.

5.0 Groundwater/Soil/Sediment/Biota

The approach to this assessment will involve the evaluation of existing reports, plans and procedures in place to ensure compliance with local, state and federal regulations, and DOE guidelines and operating procedures. It will also include tours of the facility to examine field implementation of the various activities. Additionally, we will examine whether or not programs are in place to ensure continued compliance and whether or not good management practices have been implemented where suitable regulatory or guidance methods are not yet available. Because of the interrelation with other technical areas, close liaison will be maintained with the waste management and inactive waste specialists.

5.1 Issue Identification

The current monitoring and sampling network for Sandia consists of 21 monitoring wells for groundwater, various soil boring analyses, and a biota assessment program. Results of these programs indicate that trichloroethylene contamination of groundwater in the vicinity of the chemical waste landfill has occurred (presumably originating from the landfill). Corrective actions are currently being undertaken to mitigate this groundwater contamination problem.

Several areas of interest have been identified through a review of documents provided by the facility. These include:

- Solid Waste Management Unit High Priority Task Areas (see schedule)—These areas may not be adequately monitored for releases.
- Review of Chemical Waste Landfill—Current monitoring and contaminant recovery (TCE) operations may not be meeting regulatory requirements.
- Well Abandonment Procedures and Records—Inoperable wells such as background well number 1 may not be abandoned according to New Mexico guidelines.
- Background and Down Gradient Groundwater and Vadose Zone Monitoring near SWMUs—Background sampling locations may not be truly upgradient of hazardous material release areas.
- Maintenance and Security of Monitoring Wells—Wells may not be constructed in a manner to preclude tampering and wells may not be maintained (e.g., a bailer stuck in background well number 1).
- Decontamination Procedures for Sampling Equipment—Adequate decontamination of sampling equipment may not occur since field blanks have often shown contamination.
- Well Sampling and Purging Procedures—Wells may not be sampled and purged in an adequate manner due to variable standards (e.g., a set number of well volume bailings versus stabilization of groundwater parameters (e.g., pH, specific conductivity). Also well samples have shown high turbidity and coliform counts.

- Access of wildlife to Potentially Contaminated Areas—Animals may bioaccumulate or transport hazardous materials found on site to offsite areas.
- Characterization of Groundwater Contamination—Radioactive tritium may not be identified in the groundwater with the currently used testing method.

5.2 Additional Records Required

Additional documents and files will be required for review as part of this assessment. These documents include:

- The ground water discharge plan DP-530 along with the December amendments;
- 1990 groundwater monitoring program annual report;
- Kirtland Ground Water Committee meeting minutes;
- *A Technical Plan for Further Hydrogeologic Characterization of the KAFB Region*, Goodrich, 1990;
- *A Technical Procedure for the Measurement of Static Water Levels in Ground Water Monitor Wells*, Goodrich 1990;
- Biota monitoring and sampling analyses;
- The groundwater monitoring compliance order;
- The septic tank discharge notifications to the state;
- Groundwater management program plan per DOE Order 5400.1;
- Progress towards groundwater monitoring plan per DOE Order 5400.1.

6.0 Waste Management

The waste management assessment will address solid, hazardous, and mixed waste. The assessment will be carried out by reviewing and evaluating all activities generating wastes and the treatment, storage, recycling and disposal practices involved in the handling of the waste including handling of wastes by commercial off-site facilities.

The review will cover the management of all waste streams from "cradle to grave," and will generally track facility processes that potentially generate wastes, the actual generation of wastes, and the final disposal, treatment and storage of wastes. The assessment will include facility operations and processes which potentially generate waste; waste identification and characterization; and waste accumulation, storage, treatment, recycling, transportation, and disposal.

The method of review will involve various interrelated activities. These will include:

1. Review of waste management plans, files (pertaining to waste), hazardous waste manifests, inspection records, training records, monitoring records, permits, correspondence with agencies, and any other documents or records related to waste management issues;
2. Interviews with people involved in waste management as well as with people involved with day-to-day waste activities;
3. Site tours and inspection of all waste facilities, waste accumulation areas, satellite accumulation areas, and any other areas where waste is present or potentially present.

The assessment of waste management issues will look at the programs for compliance with all federal, state and local laws and regulations. New Mexico essentially adopts federal RCRA regulations, but does have specific requirements for "special wastes" such as asbestos. Equally important will be compliance with applicable DOE Orders, including 5400.1, 5400.3, 5820.2A, 5400.5, and 6430.1A, as well as other applicable orders and SOPs.

Issues regarding mixed waste will be investigated in conjunction with the radiation specialists. Additionally, areas such as PCB wastes, asbestos wastes, air emissions from waste, and discharge of waste into waterways will be addressed in conjunction with the applicable specialists.

This assessment will also include the evaluation of all underground storage tanks (USTs), including all plans and procedures in place to ensure compliance with local, state and federal regulations, and DOE guidelines and operating procedures.

6.1 Issue Identification

Issues of particular concern will include:

- Waste generation, characterization, accumulation and storage issues as follows:
 - Technical Area I
 - Coating processes
 - Ceramic processes
 - Battery development
 - Paint shop
 - Vapor deposition processes
 - Plating processes
 - Electronics facilities
 - Photography facility
 - Environmental and health physics laboratories
 - Technical Area II
 - Waste from explosives testing
 - Metal vapor deposition studies
 - Classified wastes
 - Miscellaneous wastes in Technical Areas III, IV and V
- Waste residue (i.e., ash) from open air burn-site;
- Compliance with Part A permit for TSD facility interim status;
- Issues relating to Part B application for TSD permitted status;
- Actual facility which handles treatment and storage of wastes (Division 3211);
- Central Training Academy (CTA) especially concerning lead waste;
- Waste generated by contractors;
- Underground storage tank upgrading and monitoring as well as potential leaking;
- Waste generation and management of AMO and other facilities connected with Sandia;
- Hazardous waste training program, including training, documentation and verification (that personnel are trained);
- General recordkeeping documentation relating to waste, including hazardous waste manifests, inspection logs, and periodic waste generation reports;

- Waste characterization regarding "classified" items (which may not yet be considered waste), and mixed wastes;
- Site-wide transportation of wastes from the points of generation to temporary storage and to final storage treatment of disposal;
- Implementation of the waste minimization program.

6.2 Additional Records Required

Files will be reviewed as part of the assessment, including documents not yet reviewed or received (e.g., classified documents, individual files, documents not yet identified). Specific documents and files to be examined as part of the review process include, but will not be limited to, the following:

- Procedures for Hazardous Waste Generation, Accumulation, and On- and Off-Site Transport;
- Hazardous waste manifests;
- Manifest exception reports;
- Documents relating to hazardous waste contractors doing business with SNL;
- Any RCRA facility assessments (RFAs);
- Notices of violations and related correspondence (if not already provided);
- Documents pertaining to any RCRA corrective action orders and any New Mexico corrective action orders;
- Training records;
- Materials management and inventory documentation;
- Current copies of all RCRA permits (if not already provided);
- Inspection records;
- Any correspondence with U.S. EPA and state agencies;
- Documentation of waste handling procedures at Ross Aviation, AMO, CTA, and other facilities at SNL.

7.0 Toxic and Chemical Materials

The toxic and chemical materials (TCM) portion of the environmental assessment at SNLA will include review of all activities, facilities, areas, and documentation regarding the management of "active" chemicals. The information obtained will be used to assess whether the management and control of the toxic and hazardous materials at SNLA, which are covered by this portion, are in compliance with Federal, state and local regulations, and with pertinent DOE Orders. In addition, the application of the concepts of Best Management Practice will be evaluated.

Interviews with appropriate site personnel will be used to assess the management and control of toxic and chemical substances at SNLA. Review of documentation (including SOPs), records (including purchasing records, contracts and manifests), and site tours will also constitute important elements of this portion of the environmental assessment.

7.1 Issue Identification

The management of all "active" chemicals is of interest, although primary emphasis will be given to explosives and substances regulated by the Toxic Substances Control Act (TSCA) and the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Therefore, the chemicals of primary interest for the TCM portion of this assessment will include:

- Solvents
- Polychlorinated biphenyls (PCBs)
- Chlorofluorocarbons (CFCs)
- Pesticides
- Explosives
- Other non-radioactive process chemicals.

Because SNLA is a generator of PCB waste, with an onsite storage facility, the management of all PCB-related operations will be reviewed. SNLA documents indicate that a "comprehensive" field survey was conducted to locate, identify and inventory PCB-containing equipment, except small vacuum and hydraulic equipment and small capacitors. A disposal program is in place, which included disposal of 127 liquid PCB-items and 150 solid PCB-items (total weight 3,631.82 kg) in 1989. The survey, retrofit/removal and disposal programs will be reviewed, including procedures for identifying "PCB" items, PCB analysis, removal and handling.

As of 5 February 1990, SNLA records indicate that there remained: 6 transformers, 2 "miscellaneous" articles, 87 "PCB-contaminated" large voltage capacitors, 44 "PCB-contaminated" transformers, and 15 "miscellaneous" pieces of "PCB-contaminated" electrical equipment. The status of these items will be reviewed, and remaining items will be inspected to determine its signage, condition, potential for leakage, and the availability of spill control systems. Records of inspections and reporting will be reviewed, including those relating to spills.

SNLA documentation does not indicate the presence of chlorofluorocarbons (CFCs), and this will be confirmed. There are a number of areas such as the AMO facility, the Solar Research Area, and the Particle Beam Fusion Laboratory where CFCs might be located

and close liaison with the other Environment Team members will be maintained to identify other areas where such materials may be located.

Pesticide/herbicide usage at the SNLA site is limited to authorized certified applicators, and all operations are provided contractor pesticide programs by their host organization (SNLA or KAFB). SNLA documents indicate that Technical Area II does perform some local pesticide application. The management of these materials will be evaluated. A gap in the pesticide application records exists for a period of time during 1982-1985. Contract management procedures, application records, disposal practices, and environmental monitoring procedures will be assessed. An explanation for the gap in the records will be investigated.

Other toxic and chemical substances are stored and used at SNLA, including bulk fuel storage tanks, as well as smaller quantities of various chemicals located near their area of use. In addition to the specific inspections scheduled by the TCM specialist, the surface water specialist will investigate above ground storage facilities for "active" chemicals, and the groundwater specialist will investigate underground storage tanks containing "active" chemicals. The specialists for these three areas will work closely to coordinate their activities and observations. The SARA Title III assessment is being conducted by the Inactive Waste Site specialist.

Purchasing and storage practices relating to toxic/chemical substances will be reviewed. Programs for the management and handling of these materials will be reviewed, including the just-in-time (JIT) procurement system currently in place. Inspections of the storage of as many of these substances will be made in order to evaluate the management and handling practices of these materials.

Explosives are used for a number of activities, and the primary site of storage is in the 6,000 Igloo Area. However, there are also a number of secondary storage sites in the Technical Areas II and III, and at the Coyote Test Facility. The TCM specialist will investigate the acquisitions procedures and storage facilities and containers used for these materials.

7.2 Additional Records Required

Files will be reviewed as part of this portion of the environmental assessment, including documents not yet reviewed or received (e.g., classified documents, individual files, and documents not yet identified). Many documents have been reviewed off-site, and the on-site files will be reviewed for completeness or to follow-up questions which arise in the Pre-Site evaluation. Specific documents and files to be reviewed as part of this portion include, but will not be limited to, the following:

- Toxic substances acquisition, labeling and tracking systems, including computerized JIT system;
- Procedures for handling, control and management of toxic substances;

- Records of audits or inspections relating to the toxic substances program;
- Inventory of current PCB-contaminated electrical (especially non-transformer) equipment, or documentation of their removal;
- PCB handling, storage and disposal procedures;
- Correspondence with fire department on PCB equipment;
- Pesticide training, handling, storage, disposal records, and environmental monitoring;
- SOPs for pesticides;
- Relevant pesticide reports to regulatory agencies;
- Procedures for the handling, storage, use and disposal of chlorofluorocarbons and chlorinated solvents;
- Procurement and tracking records for explosive materials;
- SOPs explosives, including labeling and storage;
- Purchasing of chemicals records;
- Other records as determined on-site.

8.0 Radiation

The radiation portion of the environmental assessment at SNLA will include reviewing all activities, facilities, and areas that involve or potentially involve radiation or radioactive material. Environmental radiation protection programs at SNLA will be assessed to determine compliance with the documents listed in the Tiger Team Manual, applicable federal and state regulations, and Department of Energy (DOE) Orders. These programs will also be reviewed against commonly accepted best industry practices and standards of performance.

The assessment will consist of evaluating environmental radiation protection programs in the following six areas: environmental surveillance, effluent releases, radioactive waste management, radiological analyses, decontamination and decommissioning, and inactive waste sites. Radiation issues cut across all media and areas to be evaluated during the environmental assessment; hence, the radiation specialist will coordinate his reviews with the other team specialists to ensure all radiation related issues are reviewed in appropriate detail.

The approach used in conducting the assessment will consist of interviews with SNLA employees, contracted personnel, and DOE personnel; inspections of selected SNLA facilities, locations, and operational processes; and review of documents, procedures and records. Program areas will be evaluated by reviewing their defined scope, design bases, data quality, and the effectiveness of program implementation. Facility design, safety analysis, engineered safety features, and monitoring and control devices will be evaluated as they pertain to the environmental release of radioactive materials.

All of the above programs require radiological analysis of various sample media. Laboratories performing these analyses will be evaluated to ensure that analytical techniques, records, equipment, and QA/QC are adequate to produce accurate high quality data in a manner consistent with regulatory requirements. The radiation specialist will coordinate this review with the quality assurance specialist.

8.1 Issue Identification

Radiological Environmental Surveillance Program assessment will include evaluating the pathways monitored, their associated sampling locations and the bases for selection. Potential issues have been identified in the following areas: types of media, numbers of samples, and types of analysis; lack of ambient air monitoring; depleted uranium and tritium soil contamination from weapons testing in the Coyote Test Field, Technical Area III, and other areas; and surveillance of radioactive waste treatment, storage and disposal facilities in Technical Area III.

Off-site dose assessment methodologies, for maximum exposed individual, and population dose calculations, will be reviewed and evaluated including data validity, calculation methods, and analysis documentation. The methods used for data review and preparation of the radiological portion of the Annual Environmental Monitoring Report will be reviewed.

Review of the Radioactive Effluent Monitoring Program will include both liquid and gaseous effluents. Potential issues have been identified in the following areas: liquid and gaseous effluent monitors and sampling; soil column discharges; NESHAPS compliance; stormwater discharges; and application of ALARA.

The radiation specialist will coordinate reviews with the surface water, groundwater and air specialists. The gaseous effluent review will include the following: release points monitored and the bases for selection; monitor design, calibration and maintenance; and ALARA techniques utilized. The liquid effluent review will include the following: control and monitoring of continuous and batch releases including intermittent surface run-off; equipment design, maintenance and calibration; and ALARA. Analytical requirements will be reviewed including lower limits of detection, warning levels and action levels. In addition, the team will evaluate SNLA's ability to identify, control, mitigate, evaluate, and quantify unmonitored or unplanned effluent releases.

Radioactive Waste Management Program review will include both solid and liquid low level (LLW) and transuranic (TRU) radioactive wastes, and mixed wastes (MW). Potential issues have been identified in the following areas: storage of LLW, TRU, and MW characterization; Waste Isolation Pilot Plant (WIPP) certification programs, Nevada Test Site (NTS) certification program; and storage of surplus materials at Manzano Base not yet defined as waste.

The radiation specialist will coordinate this review with the waste specialist. Waste generation in the Technical and Remote Areas, and transportation to storage or process facilities will be evaluated. Waste decontamination, processing, minimization and volume reductions operations will be evaluated. Characterization, packaging, storage and shipment of LLW, TRU, and MW will be reviewed. Compliance with WIPP acceptance criteria and NTS waste acceptance criteria will be reviewed.

The Program for Decommissioning and Decontamination (D&D) of facilities will be evaluated. Potential issues have been identified in the following areas: release of materials, property, and equipment for unrestricted use; and formal D&D program for surplus, new, and operating facilities. Historical records for facilities that have undergone D&D, or decontamination and subsequent release for unrestricted use will be reviewed. Plans for existing facilities awaiting D&D and operational facilities requiring D&D at the end of their life time will also be reviewed.

Inactive radioactive material waste sites in Technical Areas II, III and radioactively contaminated areas on all of the Technical and Remote Areas will be reviewed. The radiation specialist will coordinate these reviews with the groundwater and inactive waste site specialists. The radiation specialist's concerns are limited to radiological monitoring of these sites, the degree to which radioactivity is migrating off-site into the environment, and the associated off-site dose impact, if any.

8.2 Additional Records Required

Files will be reviewed as part of this assessment, including documents not yet reviewed or received (e.g., classified documents, individual files, documents not yet identified). Specific documents and files to be reviewed as part of the assessment include, but will not be limited to the following:

- Radioactivity-related ambient air quality information;
- Radioactivity data for all sampled media;
- Inventories of air, soil, surface water, and groundwater radionuclide release points and quantities;
- Unscheduled or unplanned release reports;
- Radioanalytical quality assurance programs and procedures;
- Dose assessment methodologies, including assumptions, calculations, reporting, etc.;
- Building plot plans showing equipment and locations;
- Description of radiation monitoring equipment, practices and procedures (e.g., calibration, maintenance, etc.);
- Reports or recommendations for upgrading radiation monitoring systems;
- Reports prioritizing new radiation monitoring installations;
- Off-site and on-site radionuclide sampling point criteria;
- Rad-waste management practices, policies, procedures, treatment, storage and disposal;
- NESHAP/DOE Subpart H 61.90-61.98 reports;
- Environmental Protection Implementation Plan;
- Radioactive Waste Management Implementation Plan;
- Radioactive Waste Management Plan;
- Decontamination and Decommissioning information, plans, and data;
- Draft Environmental Monitoring Plan.

9.0 Quality Assurance

The Quality Assurance portion of the Tiger Team Environmental Assessment will consist of an evaluation of current sampling and analysis procedures performed by SNLA or by any off-site contractor conducting analyses on SNLA environmental samples to ensure that they result in the generation of scientifically valid and defensible data. Much of the environmental sampling and analysis is conducted by SNLA personnel under the direction of the ES&H Organization (3200). There are analytical laboratories located in Bldg. 869, Technical Area I.

The objective will be to assess the QA procedures for collecting process effluents and environmental samples, and for performing the laboratory analyses to identify and quantify contaminants, as well as for evaluating and reporting the data. Aspects of the ES&H QA program at SNLA which will be evaluated include: training; instrument calibration and maintenance; sample collection, preservation, handling, and chain-of-custody procedures; blank, replicate and spiked sample results; data reduction and reporting; and data documentation, including logbook and calculation reviews, and archival data storage.

S&A procedures will be reviewed to ensure that they conform to regulatory requirements, DOE Orders and guidelines and accepted practices and are being properly implemented by SNLA and contractors. Also, the inter-laboratory test programs participated in by the various laboratories as administered by the DOE's Environmental Measurements Laboratory and the EPA will be evaluated for the laboratories' performance and corrective action plans.

Primary contacts at SNLA are expected to be the QA representatives and personnel from the environmental monitoring activities and analytical laboratories. Close liaison with the other technical specialists will be maintained to ensure that QA issues are being addressed in all areas.

9.1 Issue Identification

During previous audits and surveys, it was noted that the Quality Assurance Plans throughout SNLA were not fully compliant with DOE order 5700.6B. Quality Assurance Programs and Plans will be reviewed for adequacy and compliance with DOE order 5700.6B and NQA-1.

In the past, the adequacy of chain of custody procedures at SNLA were brought into question. During the assessment, operations of the analytical laboratories will be reviewed. Attention will be focused on the areas of procedures, training, and chain of custody.

Environmental monitoring reports have indicated a moderate amount of analysis being performed by contracted laboratories. The procedures and documents used to quality, review and audit these facilities will be reviewed. Correlation between laboratories will also be investigated.

The ES&H Quality Assurance Program at the Albuquerque Microelectronics Operation (AMO) will be reviewed for compliance with DOE order 5700.6B and NQA-1. Additionally, any agreements between AMO and SNLA regarding responsibility for environmental monitoring and quality assurance will be researched.

The QA procedures for the general environmental program will be reviewed for their effectiveness and compliance with DOE requirements. This will include an assessment of the QA organization and structure.

Frequently, weaknesses in the calibration of analytical and monitoring equipment brings detected results into question. The SNLA calibration system will be reviewed for accuracy and traceability to National Standards.

9.2 Additional Records Required

Part of the assessment will consist of a review of pertinent documents and files. This will include documents not previously reviewed or received, such as classified documents, individual files, and documents which have not been identified at this time. Some specific documents and files to be reviewed in this phase of the assessment include, but will not be limited to, the following:

- QA plans and procedures for SNLA and the supporting analytical laboratories;
- SNLA environmental sampling and analysis procedures manuals;
- QA audits of environmental sampling and analysis at SNLA (1988-present);
- QA manuals and implementing procedures for the environmental monitoring and surveillance programs;
- Periodic or annual QA summary reports for SNLA;
- Summaries of results of QA sample analysis of external performance evaluation samples (e.g., from DOE's Environmental Measurements Laboratory and from the EPA);
- Training records for sample collection personnel and SNLA laboratory staff;
- Laboratory notebooks, standard data reporting forms and sampling logbooks;
- Calibration system requirements manual;
- Instrument maintenance, repair and calibration records for laboratory and field equipment;

- Results of internal precision and accuracy studies of environmental analysis;
- Memoranda of Understanding between Albuquerque Microelectronics Operation (AMO) and SNLA regarding ES&H QA programs and Plans;
- AMO ES&H QA Plans
- AMO Environmental Monitoring Program Plans
- Results of AMO Environmental Audits.

10.0 Inactive Waste Sites

The assessment will focus on the historic handling, storage and disposal of hazardous and radioactive substances, including compliance with CERCLA and SARA requirements, RCRA corrective action activities, and inactive waste site identification and cleanup activities. Particular attention will be paid to compliance with federal, state, and local laws and regulations and compliance with DOE Orders and guidelines. The assessment of inactive waste sites will be conducted in coordination with the groundwater, surface water, toxic and chemical materials, and waste management team members.

10.1 Issue Identification

Inactive waste sites are identified and managed through the Environmental Restoration Program at SNLA. This program began in 1984, with the initiation of the Comprehensive Environmental Assessment Response Program (CEARP). To date 135 sites have been identified at the Albuquerque location. These sites have been grouped into 25 operable units, each of which may contain from 1-19 release sites. The types of contaminants include volatile organics, metals, radionuclides, petroleum products and explosives.

Conduct of the assessment will require close contact with the personnel in the Environmental Restoration Program, and will include interviews with personnel in the Environmental Restoration Program, Union representatives, and long-time employees, reviews of records, and tours of various sites.

The adequacy of the methodology for identifying and characterizing inactive waste sites will be evaluated. This will include not only a review of the adequacy of the characterization and prioritization of the identified sites. Additionally, the scheduling and planning of remedial activities will be assessed, including workplan development, field data collection, and the status of remedial actions.

The assessment will also cover release reporting procedures, including the identification of substances with reportable quantities, procedures for evaluating releases subject to notification requirements, and recordkeeping and training activities. This will include SARA Title III reporting and recordkeeping, including the submission of timely reports and an assessment of the methodology used to generate such reports. All 25 operable units will be reviewed. Issues of particular concern are:

- The Chemical Waste landfill, including the types and quantities of materials that may have been deposited in the Chemical Waste Landfill;
- The radioactive dump site;
- The septic tank system—particularly septic tank systems that have received chemicals from sinks in laboratories or other sources;
- Remote areas such as Coyote and Lurance Canyons;

- Past spills that may have occurred at the Burn Site as well as at other areas;
- Gas cylinder disposal pits;
- Potential disposal or contamination at the Central Training Academy;
- Manzano Base;
- Life Sciences Division site.

10.2 Additional Records Required

The assessment of inactive waste sites will require a review of many records and files. These include, but are not limited to:

- CERCLA § 103 notifications and updates
- Site specific plans for environmental restoration
- Records regarding the status of inactive waste sites
- Environmental incident reports
- Spill reports and release notifications, including Unusual Occurrence Reports and Minor Release Reports;
- Consent orders
- Community Relations Plans
- Records regarding ongoing site identification
- Hazardous substance inventories
- Historical aerial photographs and site plans

Appendix C

Environmental Subteam Daily Agendas

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 1 April 15-20 Dick Hubbell (AIR)	AM Orientation	AMO tour - Interview AMO personnel	Interview Steam Generator personnel (Bldg. 605); Emergency Power Station (Bldg. 878)	Interview Burn Site personnel and tour facility	Interview Thunder Canyon personnel (Re: open burn permits) S. Tieszan	Document review
	PM Facility Tour	MDL tour, interview MDL ES&H personnel	Interview ES&H Division 3223 Air Program personnel	Interview Sandia Plant facilities Supervisor	Interview prior air program personnel - T. Wolff; toured Bldg. 880, where asbestos abatement project was in progress	
Janet Stevens (SW/DW)	AM Orientation	AMO tour - waste generators (MEJ)	Tour MDL and interview personnel	Observation of randomly selected tanks, transformers and other oil containing equipment per SPCC plan	Followup with: JIT, Custodial, A. Chernoff Secretary Drinking water interview - M. Goodrich and industrial hygienist; interview to followup on issue in Tech Area IV re: discharge to sump in containment area	Document review; draft findings
	PM Facility Tour	Interview internal personnel responsibility for SPCC Plan, Impl., etc.	"Observe" visit of City of Albuquerque personnel to MDL to review pretreatment, etc.			
Jean Schumann (WM)	AM Orientation	Offsite	Offsite	Offsite		
	PM Facility tour					

ENVIRONMENTAL SUBTEAM SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<p>Week 1 April 15-20 Andrew Smyth (GW/Soils)</p>	<p>Orientation</p>	<p>Interview S. Hwang and M. Goodrich of the Environmental Monitoring Division</p> <p>Interview Env. Monitoring Div. 3223 (Discuss soil, sediment, groundwater, and biota monitoring activities and results)</p>	<p>Interview G. Chavez, Radioactive and Mixed Waste Div. 3223 (Discuss waste disposal history onsite and current waste storage and treatment activities with an emphasis on potential spill areas and soil contamination)</p>	<p>Interview: R. Helgesen, Underground Storage Tank Div. 3221 (Discuss underground storage tank notification history, removals, monitoring, upgrading, construction, remediation, inspection, integrity tests, cathodic protection, tank inventories, tank contents, location, and compliance history)</p>	<p>Interview with KAO; Tour of Solid Waste Management Units (Including: Area II Radioactive Burial Site, and a septic waste discharge area with J. Cochran; toured the newer mixed waste landfill with A. Parsons and B. Knowlton</p>	<p>Document review</p>
<p>PM</p>	<p>Facility Tour</p>	<p>Tour of Manzano</p>	<p>Interview G. Yeager and D. Dion, oversight of well purging activities conducted by I.T. Corp., Haz. Waste and Wastewater Monitoring Div. 3221 (Discuss current and past discharges of liquid wastewaters to soil and groundwater, discharge plan requirements, and compliance history; with the hazardous waste section 1 will discuss waste storage and permitting and compliance issues)</p>	<p>Interview: P. Davis, B. Knowlton, A Parsons of Environmental Restoration Program; focused on issues regarding the chemical waste landfill and also discussed overall site geologic and hydrologic characterization</p>		

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 1 April 15-20 Stuart Canton (NM)	AM Orientation	Interview Env. Mgr. and Waste Mgmt. for entire facility (i.e. upper management)	Tour Div. 3211 Hazardous Waste Management, storage areas, treatment facilities	Interview Div. 3211 Records Mgr. Waste, M. Phillips, G. Chavez - mixed waste	Continue tour of HWMF; tour waste generation points and waste accumulation areas	Review hazardous waste manifests
	PM Facility tour	Interview S. Ward and review documents; tour Chemical Waste Facility Interview D. Lindner, interview selected personnel	Interview G. Yeager, Hazardous Waste Operations - S. Ward, Hazardous Waste Mgr., K. Molley, Waste Oil	Tech. Area I: tour larger waste accumulation (i.e. haz. waste and haz. materials storage area) Tech. Area I Bldg 878 - Process Development Lab (Div. 300)	Tech Area I; motorpool Bldg. 823	Review documents acquired during week
William Rhodes (RAD)	AM Orientation	Coordination activities	Interview S. Hwang (3220), review 40 CFR 61 subpart H compliance, effluent monitoring records, and quality assurance review	Tour air emission Pts. Tech. Area I and II. Review monitoring systems, inspect potential mixed waste streams.	Tour air emission Pts., Tech. Area III. Review monitoring systems, inspect potential mixed waste streams; tour with S. Hwang and facility personnel (as required)	Document review, Safety Analyses Tech. Areas I, II, III
	PM Facility tour	Manzano Base tour, inspect materials storage, review waste characterization and handling	Coordination activities	Tour with S. Hwang and facility personnel (as required)	Coord. activities	
Steve Masciulli (RAD)	AM Orientation	Interview Env. Programs Dept. Mgr. (3220); Interview G. Chavez, Radioactive and Mixed Waste Div. Supervisor (3222)	Tour Tech Area V facilities all day (radioactive liquid and gaseous effluents, effluent monitoring, waste, historical releases, etc.) SPR-III, ACCR, GIF, HCL, and SER	Interview P. Dionne (3221), J. Fish (3220), P. Davis (3223)	Interviewed: A. Stanley (3213), D. Thompson (3213), D. Sinton (3213), P. VanDevender, and J. Rice (1208)	Document review all day
	PM Facility tour	Toured Manzano Base		Interview G. Chavez Radioactive Mixed Waste Div. (3222), G. Yeager (3221)		

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<p>Week 1 April 15-20 Margaret Miller (TCH)</p>	AM Orientation	Interviews Div. 3221 re: Toxic Chemical Mgmt. - Tracking System; Purchasing through disposal: MSDSs	Tour Power Generation facilities with Air Specialist - PCB program, dielectric fluids and chemical management, interviews as appropriate - gas-fired steam plant; Emergency power facilities; PDL (878) chemical management procedures	Interview Div. 3221: Molley, Yeager, Marlman	Inspect PCB storage at 920N Walkthrough the rest of Area II for chemicals storage, pesticides	Document review
	PM Facility tour	Interviewed and inspected JIT chemical receiving and distribution area		Identify documents at Div. 3221 for Saturday review Interview Security Captain and guard	Interview L. Marlman re: non-transformer PCB program	
<p>James Melloni (QA)</p>	AM Orientation	Interview Quality Coordinator, ESH (3200): structure and organization development	Interview Records Control Coordinator (3221)	Review Qualification, auditing and controls of contracted analytical services including procurement documents; review of records retention at I.T. Corporation, Albuquerque, NM	Interview procurement personnel for contracted lab services; document review of procurement documents for contracted svcs.; interview process quality Div (7301) Supv. G. Whiting, review of audit records and procedures for ES&H QA Program	Document review; draft findings
	PM Facility tour	Tour UST Environmental Monitoring and personnel interview	Interview Rinchem records manager and tour hazardous waste management facility			

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 1 April 15-20 Jim Stevens (IWS)	AM Orientation	Safety briefing for mixed waste area	Interview G. Chavez - mixed waste area	Interview P. Davies, Program/Protocol overview	Interview B. Knowlton: RFI of mixed waste site	Document review
	PM Facility tour	Meeting to understand systems in place to manage inactive waste sites relative to CERCLA	Interview J. Cochran - Tech Area II inactive waste sites; R. Knowlton, mixed waste Interview N. Durand, M. Goodrich - inactive waste sites, Coyote, historical practices	Interview R. Kaneshiro, J. Nagel, R. Burger, Jumpstart approaches and procedures	Reviewed working group charter plus public comments	
David Isenberg (IWS)	AM Orientation	Safety briefing for mixed waste area	Interview G. Chavez - mixed waste area, J. Cochran, Tech Area II - inactive waste sites	Document review	Tour Tech Area II IWS, and mixed waste landfill	Document review
	PM Facility tour,	Meeting - understand systems in place to manage inactive waste sites relative to CERCLA	Interview N. Durand, M. Goodrich - inactive waste sites, Coyote, historical practices	SARA Titles III Program, S. Hwang, Div. 3223 - reporting, recordkeeping, calculating, etc., procedures	Document review	
Jim Daniel (NEPA)	AM Orientation	Document review; complete administrative duties	Complete administrative duties; document review	Interview R. Gonzales and J. Halpern	Interview H. Bohannon, D. Garcia, T. Hyde	Begin report writing
	PM Site tour		Interview T. Wolff, G. Emerson, and P. Davis	Document review		

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 1 April 15-22 Glenn Cada (NEPA)	AM Orientation		Document review; interview J. Williams	Interview M. Ortiz and G. Smith	Interview H. Bohannon, T. Hyde, and D. Garcia	Begin report writing
	PM Site tour	Interview T. Wolff, G. Emerson	Interview R. Gonzales, J. Halpern, T. Hyde	Document review; interview R. Gonzales	Document review; interview D. Dahlgren	
Warren Clayman (NEPA)	AM Orientation		Continue review of Self-Assessment; review SNL NEPA guidance	Interview R. Gonzales and J. Halpern	Document review	Begin report writing
	PM Site tour	Review SNL Self-Assessment	Interview T. Wolff, G. Emerson and Paul	Document review		
Gerry Eddleman (NEPA)	AM Orientation		Interview B. Lovejoy, NEPA Implementation Committee;	Interview A. Marath, G.T. Cheney, Budget Office Staff, and Project Managers in Exploratory Systems	Interview facilities staff (7800), programs managers, project leaders and training staff Same as AM	Begin report writing
	PM Site tour	Interview T. Wolff, G. Emerson	Facilities and Planning Staff; Review project lists and status reports			
Mary Peters (NEPA)	AM Orientation	Document review	Document review	Document review	Document review	Document review; begin report writing
	PM Site tour					
Virginia Tolbert (NEPA)	AM Orientation	Document review	Document review	Document review	Document review	Document review; begin report writing
	PM Site tour					

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 2 April 22-27 Dick Hubbell (ATR)	AM Interview personnel at toxic machine shop, Bldg. 869 and 840, tour facility; review plans for new facility	Interview asbestos mgmt. team personnel (Division 3221, 7853); visit removal sites, East Mesa Holding Area, Kirtland Landfill	Tour motor pool, interview personnel (fugitive emissions)	Interview Paint Shop personnel, Bldgs. 887, 840; tour Woodshop (Bldg. 887), and Box Shop (Bldg. 866)	Interview personnel at Foundry (Bldg. 841), Glass Shop (Bldg. 864) tour	Document review
PM Interview C. Chaney re: cooling tower practice	Visit Branch machine shops, 891 892, 894	Tour hazardous materials site (Bldg. 958), interview personnel (fug. emissions)	Interview S. Huang re: Air Quality Management Plan	Interview personnel at plating shop/coating shop (Bldg. 841), Welding Shop Battery Dev. Lab (Bldg. 894) and tour		
Janet Stevens (SM/DW)	AM Observation of calibration and maintenance of monitoring equipment (with QA), interviews with personnel in 7851 & 7852 re: construction compliance and inspection	Ross Aviation (with Hazardous Waste)	Observe backflow prevention devices; visit remote areas Burn Site, Aerial Cable sites, Solar Thermal Test Facility re: tanks, spills, runoff	Meet with: D. Dione, re: cooling tower discharge, septic tank M. Irwin and S. Purvis re: storm water	V. Cibicki: followup drinking water issues; J. Mercer: stormwater survey Tech Area II - wastewater generators Review reports for wastewater analysis	Document review; draft findings
PM HMMF, backflow devices, jumpstart issues in Bldg. 957 re: laundering rags with haz. materials	CTA	Bendure of AMO re: permit deactivation (MEJ) Followup on custodial issues in Area III	Review Environmental Incident Forms (89-91), Monthly Wastewater Monitoring Reports (88-90)			
Fred Iannazzi (WM)	AM Visit Tech Area V, coordinate with area & Division 3221	Ross Aviation; interviews re: management of waste; tour and verify compliance and procedures; CTA; tour hazardous waste generation points and waste accumulation areas and verify compliance	Tech Area IV; coordinate with area and Division 3221 Tour hazardous waste generation points and waste accumulation areas and verify compliance	AMO; interviews re: management of waste; tour and verify compliance and procedures Lunch - meet with Donna re: over management of waste Followup activities		
PM Tour hazardous waste generation points & waste accumulation areas and verify compliance						

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 2 April 22-27 AM Andrew Smyth (GW/Soils)	Interview J. Jones of Facility Engineering to discuss sewer maintenance and characterization activities; interview B. Cox - Motorpool, re: UST Program; interview J. Tofoya and M. Stuart, Tech Area V re: UST Program	Tour of the Chemical Waste Landfill with A. Parsons; tour of Coyote Canyon with J. Phalen in order to investigate groundwater and soil contamination	Review of an assortment of underground storage tank documents. Review of the Sandia Chemical Waste Landfill Summary	Document review of regulatory issues associated with the chemical waste landfill (NWVs) and assessment of the SNL sampling and analyses program Interview with A. Parsons, of Environmental Restoration, to discuss historical compliance issues associated with the chemical waste landfill	Document review of previous sampling and analysis records and well construction the records for the chemical waste landfill	Document review
PM	Interview B. Bultman, B. Thompson and A. Ashbacher, Bldg. 862 Managers, re: their UST program and spill control system; meeting with B. Helgesen to discuss prior and new UST issues	Meeting with B. Helgesen to further discuss UST program				

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<p>Week 2 April 22-27 Stuart Canton (WM)</p>	<p>AM</p> <p>Tech Area 1; Bldgs. 861, 887-Paint Shop; tour waste generation points and waste accumulation areas</p> <p>PM</p> <p>Tech Area 1; Bldgs. 841-Plating, 840-Main Shop</p>	<p>Finish review of Bldg. 841; review plating & painting processes & waste generation; Tech Area II; classified wastes - interview re: management of classified waste; tour area and verify procedures</p> <p>Explosives - interview re: management of explosive waste; tour area and verify procedures</p>	<p>Interview K. Molley re: status RCRA permitting process; tour classified waste landfill with S. Chavez</p> <p>Medical Waste interviews re: management of medical wastes; tour areas and verify procedures</p>	<p>Tech Area III - Rad & Mixed Waste Landfill and Storage w/B. Rhodes; tour area for compliance verification.</p> <p>Tour Active Classified Waste Landfill. Lunch - meet with Donna re: over management of waste. Selected Mixed waste Storage & Generation Areas w/B. Rhodes; tour areas for verification of compliance</p>	<p>Kirtland AFB Landfill tour & interview re: acceptance & disposal Sandia waste</p>	<p>Document review</p>
<p>Jean Schumann (WM)</p>	<p>AM</p> <p>Offsite</p> <p>PM</p>	<p>Offsite</p>	<p>Manifest review</p>	<p>Manifest review</p> <p>Classified Waste Landfill</p>	<p>Medical waste review</p>	<p>Document review</p>
<p>William Rhodes (RAD)</p>	<p>AM</p> <p>Tour air emission Pts., Tech. Area IV; review monitoring systems, inspect potential mixed waste streams; tour with facility personnel (as required)</p> <p>PM</p> <p>Tour air emission Pts., Tech. Area V; review monitoring systems, H2PA filtration systems, inspect potential mixed waste streams; tour with S. Hwang and facility personnel (as required)</p>	<p>Tour air emission Pts., Tech. Area V; ACR, Hot cells review monitoring systems, H2PA filtration systems, inspect potential mixed waste streams; tour with S. Hwang and facility personnel (as required)</p>	<p>Tour remote areas, review air emission sources, inspect mixed waste streams, review survey practices following tests; Coyote Test field (9920, 9927, 9990, Firing site, Thunder Range, Lurance Canyon Burn Site</p>	<p>Interview T. Wolff 3223, D. Sinton 3213, (measurement of air effluent), P. Davis 3223 (air effluent from ER sites) L. Newby 3201 (audits) H. Abbott 3212</p>	<p>Interview G. Smith, 3220; KAO interviews, Env. Protection Div., R. Gonzalez, discuss NESHAPS for radionuclides, compliance</p> <p>Coordination activities</p>	<p>Document review, Safety Analyses Tech. Areas IV and V</p>

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 2 April 22-27 Margaret Miller (TCM)	AM Inspect AMO RE: Chemicals Mgmt. program & Elementary neutralization unit; int. Div. 2000, Jumpstart, Mgmt. Program; inspect MDL Chemicals Mgmt. Program, temp transformer	PM 6000 Igloo Area Explosives (shipment); chemicals storage program Interview some members of 1000 Jumpstart Program re: chemicals program in the research laboratories	Inspection of chemicals and explosives handling, PCBs and pest mgmt. in the remote areas Explosives testing; thermal test facility; Drop site; Rocket Conditioning Facility	Interview K. Modey, L. Marlinen re: PCB program Interview pesticide contractor; Sandia interviews re: pesticide contracts and purchases and program mgmt.	Orphan Chemical Program; Chemical Training Program; Reapplication Program Procedures; chemical inventory Inspect chemical research labs in Bldgs. 805, 806, and 807	Document review
James Melloni (QA)	AM Tour: wastewater monitoring activity- calibration maintenance of monitoring equip.; interview water monitoring personnel; tour Primary Stds. Lab - procedure and document review; interview personnel	PM Review of document control & control of purchases, forms, & services Interview Lab personnel Tour calibration laboratory; interview personnel re: calibration procedures	Tour ACRR TAI to witness calibration of monitoring equipment. Interview personnel review procedures	Tour RAD Standards Laboratory Interview personnel re: calibration and traceability Tour Bldg. 862 UST to examine the leak detection monitor	Review of drawings for UST leak detection system Tour Environmental Chemistry Lab - procedure and record review Interview re: training for ES&H QA program personnel	Document review; draft findings; interviews re: use of contracted radiation analysis laboratories
Steve Masciulli (RAD)	AM Interview M. DeWitte, Mgr. 7840, J. Fulaus, Supv. 7823, A. Spencer, Mgr. 7840; tour PBFA-II, neutron measurements lab, bldg. 962; PM Tour STL, SATURN, SDL decontamination facility	MW, LLW disposal and storage areas, RMWMF, Old Sled Track, 6936 storage area Visit 6635, 6710, 6720, 6510, 9939	Interview S. Hwang (3223) EPIP, EMP, environmental monitoring, annual report, all day	Toured TA II Low level waste disposal, classified disposal, irradiated material yard, uranium pits and building 915 Interviews in Facilities Management: J. Furaers, K. Roach, L. Seamons, J, Danneel	Interview J. Philbin (6453); interview L. Restrepo (6453); T. Schmidt (6400) Interview KAO personnel - S. Umshler, J. Andrews, R. Gonzales	Document review; draft findings

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 2 April 22-27 Jim Stevens (IWS)	<p>AM</p> <p>Contact PR departments in Sandia and AL for information on Public Communication Program</p> <p>PM</p> <p>Tour low priority site - Tech Area III & V</p>	<p>Evaluate Basis for decisions to classify sites as RCRA or CERCLA</p> <p>Continue contacts with public communications personnel</p>	<p>Review information collected; begin categorization</p> <p>Meet with J. Andrews, S. Umshler, KAO, re: RCRA, CERCLA</p> <p>Meet with S. Slaton re: property transfer</p>	<p>Interview J. Phelan re: NCP/CERCLA; L. Dailleboust re: property transfer</p> <p>Document review</p>	<p>Document review; contact G. Pleenor, J. Johnson re: Incident Report U9</p> <p>Categorization of observations</p>	<p>Internal Environment Team coordination between IWS, GW/Soils, and WM</p> <p>Continue developing findings</p>
David Isenberg (IWS)	<p>AM</p> <p>Tour ER sites; review SARA Title III documents and reports; review information of property transfer;</p> <p>PM</p> <p>Mtg. with M. Irwin (3223) re: D&D of buildings; mtg with N. Durand (3223) re: occurrence reporting</p>	<p>Meeting with J. Phalen (3223) re: sys plans for ER, occurrence reporting</p> <p>View east mesa asbestos storage area and KAF asbestos landfill</p> <p>Meet with KAF ER liaison - Col. Martinez</p>	<p>Meet with R. Kaneshiro, view potentially unidentified IWSS</p> <p>Meet with B. SARA Hawkins re: SARA reporting</p>	<p>Review understanding of IWS Program</p> <p>Document review</p>	<p>Meet with D. Garcia re: CERCLA & property transfers</p> <p>Document review</p>	<p>Meeting with IWS GW/Soils and WM specialists; debrief</p>
Jim Daniel (NEPA)	<p>AM</p> <p>Followup interview, as appropriate</p> <p>PM</p> <p>Report writing</p>	<p>Followup interviews, as appropriate</p> <p>Report Writing</p>	<p>Report to Environmental Subteam Leader (D. Bergman)</p> <p>Report given to SNL/KAO staff for review</p>	<p>Comment resolution; report revised as necessary</p>	<p>Travel</p>	

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 2 April 22-27 Glenn Cada (NEPA)	AM Followup interviews, as appropriate PM Report writing	Followup interviews, as appropriate Report writing and review	Report writing and review	Report writing and review; report revised as necessary	Depart	
Warren Clayman (NEPA)	AM Report writing PM	Report writing and review	Report writing	Report writing; report revised as necessary	Report finalized; Travel	
Gerry Eddlemon (NEPA)	AM Interview A. Chernoff; followup interviews, as appropriate PM Report writing	Followup interviews, as appropriate Report writing	Report writing and review	Report writing and review; report revised as necessary	Travel	
Mary Peters (NEPA)	AM Report writing PM	Report writing	Report writing and review	Report writing and review; report revised as necessary	Travel	
Virginia Tolbert (NEPA)	AM Report writing PM	Report writing	Report writing and review	Report writing and review; report revised as necessary	Travel	

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 3 April 29-May 3 Dick Hubbell (AIR)	AM Interview Thermal Treatment Facility personnel, tour facility, Area III Machine Shop PM Interview T. Workman re: Tech Area III emissions; interviewed personnel concerning paper incinerator, film disintegrator	Interview Sandia construction site management personnel re: soil disturbance; visit new construction sites, IMRL, Bldg. 827, sewer project Area III Visit Heat Treat Facility (Bldg. 841), O-Area Lead storage, and PDL, Plastics Lab	Visit Tech Area V Hot Cell Facility, ACRR Visit PDL, Brazing/Thin Film Deposition Lab, Hybrid Microelectronics Circuits Lab, Printed Circuit Division Lab	Interview Tech Area III personnel; visited Sled Track. Interview Explosives Testing Personnel	Followup activities at prior sites	Travel
Janet Stevens (SW/DW)	AM Tech Area I: Bldgs. 840, 841, 860, 887 PM Interview S. Umschler re: water use, Kirtland well 10, J. Davis re: delivery of water to Live Fire Range	Tech Area I: Bldg. PDL, 823, 805, 806, 807, 893 Interview C. Chavez re: chemicals and discharge from cooling towers, coolers, etc.	Tech Area IV Interview C. Robertson re: photographic chemical use/disposal Interview J. Jones re: sewer, water system	Tech Area III and V: Bldg. 6540, 6541, 6630, 6710, 6721, Drop Tower Interview S. Hwang re: environmental sampling program Interview G. McLellan, re: Maintenance of waste and sewer systems Interview B. Holley re: ES&H training regarding spills	Interview N. Ortiz, J. Pigg, re: followup on water issues at Live Fire Range Followup as needed; finish draft findings	

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<p>Week 3 April 29-May 3 Andrew Smyth (GW/Soils)</p> <p>AM</p>	<p>Review documents; interview M. Goodrich, non-ER Groundwater Monitoring Group, re: the degree to which current groundwater monitoring activities provide statewide groundwater characterization; met with B. Knowlton, responsible for the mixed waste landfill monitoring program, re: monitoring activities at the mixed waste landfill; also, oversaw some groundwater purging and sampling activities at the mixed waste landfill.</p>	<p>Phone conversation with B. Swanton of the NMED re: Chemical Waste Landfill groundwater issues</p> <p>Tour and review of the Tech Area III Thermal Treatment Unit; meet with PL Davis, B. Knowlton, A. Parsons, and M. Goodrich re: the status of previously discussed groundwater issues</p>	<p>Breakfast meeting with Kirtland Area Groundwater Counsel; interview with Aaron Bond and Steve Ward concerning RINLOW operations.</p> <p>Interview with Steve Dion about the wastewater program. Oversight of an UST removal and discussions with Bill Rose and Bob Barker about waste oil characterization and disposal.</p> <p>Later I spoke with L. Mariman and Dave Dyer about waste oil characterization. Thereafter I spoke with Steve Hodgeland of Tech Area V and Jeff Kubisak about a waste oil tank.</p>	<p>Document review Oversee monitoring and well purging and sampling at the Mixed Waste Landfill</p> <p>Interview S. Hwang re: the status of previously discussed environmental surveillance issues</p> <p>Interview Bob Helgesen and Steve Dion regarding the status of previously discussed environmental surveillance issues</p>	<p>Document review Travel</p>	<p>Travel</p>
<p>PM</p>						

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 3 April 29-May 3 Stuart Canton (WM)	LITT	Visit Mixed Waste Landfill & Storage Area and selected mixed waste storage areas with B. Rhodes Interview S. Umpshler re: KAO involvement in Sandia permitting process under RCRA	Meet with S. Ward re: Management of hazardous waste	Meet with S. Ward re: Management of hazardous waste Meet with AL re: interface on hazardous waste issues	Solar Energy Res. & Thermal Treatment; tour waste generation points & waste accumulation areas Followup as needed	Travel
Jean Schumann (WM)	Offsite	Offsite	Offsite	Offsite	Offsite	
William Rhodes (RAD)	Coordination activities	Tour Tech Area III Landfill & storage area, meet with Gloria Chavez on open issues. Coordination activities	Coordination activities; meet with G. Smith and C. Massey on mixed waste storage, meet with S. Hwang on open issues	Coordination activities; meet with Jim Fish on waste minimization,	Review air effluent measurements Coordination activities	Travel

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<p>Week 3 April 29-May 3</p> <p>Margaret Miller (TCM)</p> <p>AM</p> <p>PM</p>	LITT	Interviews re: Chemical Exchange Program; Potentially Explosives Program; Chemical SOPs	Interviews: Security-training 3220 overall program and pollution prevention; Above ground chemical storage	Interview 7816 re: PCB pole-mount transformers; Inspect Tech Area IV Chemical Storage; Interview re: chemical purchase orders	Interview with M. Peterson (7816) re: outside, above- ground storage for chemicals/gases	
<p>James Melloni (QA)</p> <p>AM</p> <p>PM</p>	<p>Personnel interview; review Dept. 3220 Finding tracking system; review use of contracted laboratories</p> <p>Calibration review; Review of groundwater monitoring activity</p>	<p>Interview L. Newby (3201) ES&H Regulatory Assessment re: audit activities</p> <p>Review of ES&H document control procedure</p>	<p>Tour AMO ES&H QA Program - document and records review</p> <p>Interview ES&H and QA personnel</p> <p>Interview T. Lovato (2831) re: Document Control System review process</p>	Interview: Stan Love (3200A) re: finding tracking and training	<p>Followup activities at prior sites</p> <p>Attend ED SOP Review Board</p> <p>Interview purchasing ES&H Coordinator; Interview: ES&H training division</p>	Travel
<p>Steve Masciulli (RAD)</p> <p>AM</p> <p>PM</p>	<p>Interview AL personnel: G. Runkel, C. Soden, J. Evett</p> <p>Interview G. Tucker, 3212</p>	<p>Tour Tech Area I all day for radioactive effluents and radioactive waste; Bldgs. 805, 807, 809, 818, 819, 840, 867, 869, 893, 894</p>	<p>Interview M. Irwin (3223) D&D, stormwater run-off, property release; Interview R. Stump (3212)</p> <p>Interview W. Booher (3221); Interview L. Newby (3201)</p>	<p>Interview N. Durand (3223); Interview W. Burnett (3210), Radiological and Criticality Safety committee Chairman;</p> <p>Interview R. Senna, DOE/AL; Interview R. Knowlton (3223)</p>	<p>Interview R. Hamilton, J. Fish</p> <p>Interview K. Carlson, D. Morton DOE/AL</p>	Travel

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 3 April 29-May 3 Jim Stevens (IWS)	<p>AM</p> <p>Document review; expanded BMP finding</p> <p>PM</p> <p>Meeting with ERID personnel to review CERCLA/RCRA; attempted contact state and EPA personnel</p>	<p>Document review; review of SARA reporting; contacted S. Hwang</p> <p>Review 1989-1990 UORs; contacted Dr. Gordon, NMED and R. Mayer, EPA Region VI re: RCRA</p>	<p>Discuss UOR Reporting 5000.3A with D. Hughes and Records with T. Kelly</p> <p>Document reviews</p>	<p>Followup interviews and document review</p>	<p>Followup interviews and document review</p>	<p>Travel</p>
David Isenberg	<p>AM</p> <p>Visit sled track re: release of reportable quantities; review past spills at Burn Site</p> <p>PM</p> <p>Meeting re: resolve Tiger Team understanding of the interrelationship of CERCLA and RCRA; Meeting re: review with Division 3223 alleged (by SNL employee) unidentified IWS</p>	<p>Meet with IH re: SARA Title III, and then with EIR re: SARA Title III</p> <p>Meet with Org. 3221, Hazardous Waste & Wastewater re: spent rocket motors; DOE-AL re: Federal real property sale and transfer</p> <p>Finalize/formalize overview of IWS</p>	<p>Breakfast with Kirtland Area Groundwater Council</p> <p>Tour/interview Foundry Div. 7473-5, Liquid Metals Lab, Div. 1833</p>	<p>Meeting with former member of Org. 9220 re: identification of unidentified IWS</p> <p>Followup on open/resolved issues</p>	<p>Followup on open/unresolved issues</p>	<p>Travel</p>
Jim Daniel	<p>AM</p> <p>Offsite</p> <p>PM</p>	Offsite	Offsite	Offsite	Offsite	

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 4 May 6-11	AM	Environment Subteam Offsite				
	PM					

**ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 5 May 13-18 Dick Hubbell (AIR)	AM Conversation with Scott Stapp of Air Quality Control Board regarding Open Burn Permits visited Tech. Area III, Liquid Metal Processing Facility, Buildings 6501, 6720, Fuel Dispensing Facility	Interview with Sue Umshler, regarding AHO oversight, spoke with Bob Harley of Albuquerque/Bernalillo County AQCB, about Air Toxics Program. Spoke to Bill Rose at Motor Pool, Rick Gonzales KAO Air Program, reviewed findings with counterpart	Followup and revise findings as necessary	Followup and revise findings as necessary	Revise findings as necessary	Technical Accuracy Review
PM						
Janet Stevens (SH/DW)	AM Observe set up for wastewater activities Interview D. Dionne re: NOIS	Observe wastewater sampling activities. Interview: Joe Jones re: followup on reports on water and sewer systems. Discuss cross-connections with J. Jones, M. Irwine, S. Umshler. Call Environmental Health re: drinking water.	Review findings with A. Jones. Revise/followup findings	Technical Accuracy Review	Revise findings as necessary	Revise findings
PM	Tour Building 863 re: motion picture and film processing. Call County Public Health Dept. re: drinking water					
Andrew Smyth (GW/Soils)	AM Prepare findings	Prepare findings	Prepare findings	Technical Accuracy Review	Finalize findings and write Overview	Finalize findings
PM						

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 5 May 13-18 Stuart Canton (WM)	<p>AM</p> <p>Tour HWMF</p> <p>PM</p> <p>Check additional documents re: classified waste landfill</p>	<p>Interview John Evett at Albuquerque Operations Office</p> <p>Interview with Steve Ward and Gary Yeager. Call State re: status KAFB landfill</p>	<p>Disc. SEN-7 report with Al Sikri. Continue writing finding and document review as needed for specific followup.</p>	<p>Followup and continue writing finding</p>	<p>Followup and continue writing findings</p>	<p>Technical Accuracy Review</p>
Jean Schuman (WM)	<p>AM</p> <p>PM</p> <p>Review findings, jumpstart, site documents</p>	<p>Read jumpstart backup documents. Investigate KAFB hydrogeologic characterization study: Read documents, interview Sue Umshler, Jim Lester.</p>	<p>Interview Mike Goodrich, John Cochran</p> <p>Interview Steve Ward, continue followup</p>	<p>Followup and continue writing finding</p>	<p>Followup and technical accuracy reviews</p> <p>Travel</p>	
William Rhodes (RAD)	<p>AM</p> <p>PM</p> <p>Coordination activities</p>	<p>Coordination activities</p> <p>Review lead survey with John Archuleta</p>	<p>Coordination activities</p> <p>Review health physics program for the recap yard. HEPA filter testing followup.</p>	<p>Coordination activities</p> <p>Technical Accuracy Review</p>	<p>Coordination activities</p>	<p>Coordination activities</p>

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE ACTIVITIES

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 5 May 13-13 Margaret Miller (TCM)	AM PM	Followup to close out concerns identified in jumpstart reports re: potentially explosive chemicals. Followed up on temperature monitoring for outside storage of compressed gas cylinders. Followed up on spill training.	Followup and continue writing findings	Followup and continue writing findings	Technical Accuracy Review	Followup and revise findings
James Melloni (QA)	AM PM	Document review of AMO Interview air 3200 quality coordinator	Finalize draft findings	Technical accuracy review	Followup and continue writing findings	Followup and revise findings
Steve Masciulli (RAD)	AM PM	Interview J. Furaus 7823, J. Hands 7853, S. Vigil 7821 Interview D Hughes 3443	Review documents interview H. Bohannon DOE/KA0	Review documents Write findings	Review documents Write findings; Technical Accuracy Review	Revise findings

Appendix D

Contacts/Interviews (Attached on Microfiche)

Appendix E

List of Documents (Attached on Microfiche)

Appendix F

OSHA Noncompliances (Attached on Microfiche)

Appendix G

Hot Line Calls

APPENDIX G

TIGER TEAM HOT LINE CALLS AND RESPONSES SANDIA NATIONAL LABORATORIES, ALBUQUERQUE

An onsite Tiger Team Hot Line for ES&H complaints was established for the SNL, Albuquerque, assessment, and operated by the Tiger Team between April 15 and May 17, 1991. The hot line was established to allow SNL, Albuquerque, personnel, as well as the general public, to report specific ES&H concerns. Notification of the hotline and its purpose was made in local newspapers, at a press conference, and through site newsletters. In addition, notices developed by the DOE Office of Special Projects (EH-5) were distributed to each SNL, Albuquerque, and other DOE site tenants. The notices also informed SNL, Albuquerque, employees that information related to fraud, waste, abuse, misconduct, and environmental issues of a criminal nature could be reported directly to the DOE Office of the Inspector General at (800) 541-1625, (202) 569-4073, or FTS 896-4073.

This Appendix provides a synopsis of each call received on the hot line and the subsequent response actions taken by the Tiger Team.

**SANDIA NATIONAL LABORATORIES, ALBUQUERQUE
TIGER TEAM ASSESSMENT HOT LINE REPORTS**

CONTROL #1

DATE: April 19, 1991

NATURE OF CONCERN: The caller wanted to bring to the attention of the Tiger Team the existence of unique nuclear detonation safety activities for the prevention of undesired nuclear weapons detonation in Divisions 7231 and 7232. Although of extremely low probability, an accident involving these activities has the potential for extremely severe environmental impact.

RESPONSE: The concern was referred to the Safety and Health Subteam for resolution. It was determined that safety systems in place adequately reduce risk to acceptable levels. Nor was there evidence that safety features for this developmental effort had failed. No further action was taken.

CONTROL #2

DATE: April 19, 1991

NATURE OF CONCERN: The caller indicated that the vacuum system in Bldg. 840 operating out of the composite shop had not had scheduled maintenance in approximately 20 years. According to the caller, the system gets clogged with toxic materials and must be cleaned out by specially trained personnel. This practice has not always been followed in the past.

RESPONSE: The matter was referred to the Safety and Health Subteam. A visit to the area, interviews with personnel in Division 7481, and a review of Appendix A3 to SP471615 (Composite Machining) indicated initially that no items listed in the Appendix could comprise a serious health effect. However, the Appendix listing was incomplete, and the physical state of materials known or suspected to be in the vacuum system could cause possible personnel exposures to nuisance dust. This matter was referred to Organization 3211 further action regarding respiratory protection controls for this cleaning operation.

CONTROL #3

DATE: April 23, 1991

NATURE OF CONCERN: The caller indicated that in Division 7816 the bridge cranes were not being worked on in accordance with OSHA and ANSI standards. For example, the caller claimed that brakes were not being inspected annually. Prior reports of these alleged deficiencies had been made to management, according to the caller.

RESPONSE: The Safety and Health Subteam found that cranes and hoists, in some instances, were not inspected or maintained in accordance with 29 CFR 1910.179 or the manufacturers recommendations. Although SNL, Albuquerque has employed a subcontractor to assist in correcting the situation, additional emphasis is required. This issue resulted in a Category II Concern (WS.4-5) reported in Section 4.5.15.2 and Concerns MA.6-2 and OS.2-2 in Sections 4.5.4.2 and 4.5.17.2, respectively, of the Tiger Team Assessment Report.

CONTROL #4

DATE: April 23, 1991

NATURE OF CONCERN: The caller indicated that electrical equipment was neither repaired nor maintained properly, that training in electrical maintenance was inadequate, and that management was not responsive to correcting the problem.

RESPONSE: The Safety and Health Subteam investigated the allegations. Field investigation and interviews revealed that the facts supported the allegations. This issue is addressed in Concerns MA.2-1, MA.5-2, and a Category II Concern, WS.4-9, in Sections 4.5.4.2 and 4.5.15.2 of the Tiger Team Assessment Report. OSHA Form 1-B inspection reports were prepared and are found in Appendix F of the Report.

CONTROL #5

DATE: April 24, 1991

NATURE OF CONCERN: Three concerns were indicated by the caller: (1) The ceiling tiles of Room 3, Bldg. 864, Tech Area III, allegedly contained asbestos, the area above the tiles must be vacuumed, and there was concern regarding the return vent in the area; (2) The benches in Room 5 of the same area indicated in (1), above, allegedly were constructed of transite (solid asbestos); and (3) the use of northwest glass lathes near a high pressure natural gas pipe within 3-inches of a quartz annealing furnace.

RESPONSE:

The concerns were referred to the Safety and Health Subteam for investigation. The results are indicated below:

- (1) Investigation revealed that the area in question (overhead) above the tiles was posted as an "Asbestos Restricted" area not a "Regulated" area. The area is not a supply or return air plenum. The area is noted in the building asbestos plan and is in a controlled condition. No further action was taken.
- (2) The benchtops are constructed of "thick transite" in a stable, nonfriable condition. Observation revealed that the activities and conditions under which it is used normally do not create friable material. The material has been in place for years and does not exhibit signs of abrasion. More certain measurement through ambient air monitoring could be conducted to document the airborne fiber level. According to DOE criteria, "asbestos in a stable, nonfriable condition" shall not be removed for the sake of removal only. No further action was taken.
- (3) Investigation resulted in an OSHA Form 1-B report being prepared (See Appendix F of this Report). The action has been referred to Organization 7476 for followup and corrective action.

CONTROL #6

DATE: May 2, 1991

NATURE OF CONCERN:

The caller requested Tiger Team personnel meet with employees who were concerned about current and prior chemical exposures in Bldgs. 878 and 880. At the meeting, allegations were made that past industrial hygiene monitoring was not conducted in a professional manner; not all monitoring results have been provided to employees; past monitoring did not encompass all process, exposures and bench or hood flow rates; past and present controls did not address contact exposure and proper personnel protective equipment; no trending of numbers and type of injuries/illnesses had occurred; medical personnel failed to correlate the recurrence of specific symptoms and illnesses related to employees in specific work areas, and, until a year ago, no Material Safety Data Sheets or training on Hazard Communication was conducted for processes in which the complaining workers were involved. There were also ergonomic concerns involving the use of

tweezers, miscroscopes, cleaning benches, and hood heights.

RESPONSE:

Since these issues were beyond the scope of the Tiger Team Assessment, they were referred to the DOE Headquarters Office of Health (EH-40) for followup. However, see related Concerns IH.4-1, IH.5-5, IH.6-2 in Section 4.5.16.2 and Concern MS.1-1 in Section 4.5.19.2 of the Tiger Team Assessment Report.

END

**DATE
FILMED**

12/11/191