Waste Sampling and Characterization Facility (WSCF)

Maintenance Implementation Plan

J. L. Bozich
PDCME

Date Published
July 1993

Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management

**Westinghouse
Hanford Company**

P.O. Box 1970
Richland, Washington 99352

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

Approved for Public Release

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

Date Received: 7/21/93 KMB		INFORMATION RELEASE REQUEST		Reference: WHC-CM-3-4	
Complete for all Types of Release					
Purpose ☐ Speech or Presentation ☐ Full Paper ☐ Summary ☐ Abstract ☐ Visual Aid ☐ Speakers Bureau ☐ Poster Session ☐ Videotape			Reference ☒ Technical Report ☐ Thesis or Dissertation ☐ Manual ☐ Brochure/Flier ☐ Software/Database ☐ Controlled Document ☐ Other		
			ID Number (include revision, volume, etc.) WHC-SP-1009, Rev. 0		
			List attachments.		
			Date Release Required		
Title Waste Sampling & Characterization Facility Maintenance Implementation Plan				Unclassified Category	
				Impact Level	
New or novel (patentable) subject matter? ☒ No ☐ Yes If "Yes", has disclosure been submitted by WHC or other company? ☐ No ☐ Yes Disclosure No(s).			Information received from others in confidence, such as proprietary data, trade secrets, and/or inventions? ☒ No ☐ Yes (Identify)		
Copyrights? ☒ No ☐ Yes If "Yes", has written permission been granted? ☐ No ☐ Yes (Attach Permission)			Trademarks? ☒ No ☐ Yes (Identify)		
Complete for Speech or Presentation					
Title of Conference or Meeting			Group or Society Sponsoring		
Date(s) of Conference or Meeting		City/State		Will proceedings be published? ☐ Yes ☐ No Will material be handed out? ☐ Yes ☐ No	
Title of Journal					
CHECKLIST FOR SIGNATORIES					
Review Required per WHC-CM-3-4		Yes No Reviewer - Signature Indicates Approval			
		Name (printed) Signature Date			
Classification/Uncontrolled	☐	☒			
Nuclear Information	☐	☒			
Patent - General Counsel	☒	☐	S. W. Berglin		
Legal - General Counsel	☒	☐	S. W. Berglin		
Applied Technology/Export Controlled Information or International Program	☐	☒			
WHC Program/Project	☒	☐	S. M. Joyce		
Communications	☐	☒			
RL Program/Project	☒	☐	T. M. Stram		
Publication Services	☒	☐	S. E. H. Ard		
Other Program/Project	☐	☒			
Information conforms to all applicable requirements.			The above information is certified to be correct.		
References Available to Intended Audience ☒ Yes ☐ No Transmit to DOE-HQ/Office of Scientific and Technical Information ☒ Yes ☐ No Author/Requestor (Printed/Signature) Date L.S. Messinger <i>L.S. Messinger</i> 7/21/93			INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP Stamp is required before release. Release is contingent upon resolution of mandatory comments. <div style="text-align: center;"> </div>		
Intended Audience ☐ Internal ☐ Sponsor ☒ External Responsible Manager (Printed/Signature) Date D.W. Wilson <i>D.W. Wilson</i> 7/21/93					
			Date Cancelled Date Disapproved		

Legends/Notices/Markings (required per WHC-CM-3-4 or guidance organization.) (Reviewer initials)				
		<u>Affix</u>		
	<u>Yes</u>	<u>No</u>		<u>Affix</u>
	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>
Applied Technology	☐	☐	Predecisional Information	☐
Business-Sensitive Information	☐	☐	Programmatic Notice	☐
Computer Software Notice	☐	☐	Proprietary Information	☐
Copyright License Notice	☐	☐	Purpose and Use	☐
Export Controlled Information	☐	☐	Thesis/Dissertation	☐
Legal Disclaimer	☒	☐	Trademark Disclaimer	☐
Limited Disclosure	☐	☐	Unclassified Controlled Nuclear Information/Official Use Only	☐
Patent Status	☐	☒		☐

APPROVALS

Prepared By:

J. L. Bozich
Procedure Development and
Control Maintenance Engineering

7-12-93
Date

Approved By:

C. A. Meldrum, Manager
Plutonium Finishing Plant
Maintenance

7/25/93
Date

M. L. Bell, Manager
Processing and Analytical
Laboratories

7-23-93
Date

E. F. Gray, Manager
Operations Maintenance Support

07-28-93
Date

R. R. Grabbe, Manager
WSCF Analytical Operations

7-28-93
Date

FOREWORD

This Maintenance Implementation Plan has been written to satisfy the requirements of DOE Order 4330.4A, "MAINTENANCE MANAGEMENT PROGRAM", that specifies the general policy and objectives for the establishment of DOE controlled maintenance programs. These programs should provide for the management and performance of cost-effective maintenance and repair of Department of Energy (DOE) property, which includes facilities.

A review of DOE Order 4330.4A, particularly Chapter II the nuclear portion, against existing WHC site programs and policies has provided assurance that most requirements of this order have already been implemented by existing WHC programs. Most requirements and applicable guidelines of 4330.4A that are deficient or not implemented are presently being developed and implemented through WHC site policies and programs. Where no program is presently identified or being developed for 4330.4A requirements, responsibility for implementation has been assigned within this plan.

In order to implement the requirements specified, this order requires that a Maintenance Management Plan be developed for each new DOE controlled facility where maintenance is contractually the responsibility of DOE and where Federal funds are used totally or in part. In developing a maintenance plan for the Waste Sampling & Characterization Facility (WSCF) a number of evaluations will need to be performed and their results considered for implementation. A maintainability study should be performed for ergonomic and ALARA considerations of maintenance activities to maximize the accessibility of equipment and components for maintenance and minimize radiation exposure. Through a concerted maintainability design review of WSCF, an efficient and cost effective maintenance program shall be implemented.

This Maintenance Implementation Plan is conditional on final disposition of the SAR (Safety Analysis Report). Once the SAR is issued this document should be reviewed to assure that SAR impact is addressed and revision of this document is not required.

CONTENTS

1.0 EXECUTIVE SUMMARY	1-1
2.0 INTRODUCTION	2-1
2.1 Facility Complex Description	2-1
2.2 Mission	2-2
2.3 History/Scheduled Life	2-2
3.0 DOE ORDER 4330.4A REQUIREMENTS	3-1
3.1 Maintenance Management Program Scope	3-1
3.2 Maintenance Program Requirements	3-1
3.3 Self-Assessment Program	3-1
3.4 Graded Approach Strategy	3-2
3.4.1 Overall Strategy and Basis	3-2
3.4.2 Strategy for Safety Related Items	3-2
4.0 U.S. DEPARTMENT OF ENERGY ORDER 4330.4A CHAPTER II REQUIREMENTS	4-1
4.1 Evaluation of Compliance Elements	4-1
4.2 Maintenance Organization and Administration	4-1
4.2.1 Maintenance Organization Policies	4-1
4.2.2 Maintenance Strategy	4-2
Working Relationships	4-2
Long Range Planning	4-2
4.2.3 Staffing Resources	4-3
4.2.4 Goals, and Objectives	4-4
4.2.5 Accountability	4-4
4.3 Training and Qualification	4-5
4.3.1 Responsibilities	4-5
4.3.2 Maintenance Training Programs	4-5
4.3.3 Training Schedules and Support	4-6
4.3.4 On-the-Job Training	4-6
4.3.5 Qualifications	4-7
4.3.6 Training in Root Cause Analysis	4-8
4.3.7 Training Program Approval, Effectiveness, and Feedback	4-8
4.3.8 Management and Supervisory Training	4-9
4.4 Maintenance Facilities, Equipment, and Tools	4-10
4.4.1 Facilities	4-10
Shops and Satellite Work Areas	4-10
Lay-down and Staging Area	4-11

WHC-SP-1009, Rev. 0

Storage Facilities	4-11
Temporary Facilities	4-11
Decontamination Facilities	4-11
4.4.2 Tool and Equipment Storage	4-12
4.4.3 Office Equipment	4-12
4.5 Types of Maintenance	4-13
4.5.1 Master Equipment List	4-13
4.5.2 Types of Maintenance	4-13
Corrective Maintenance	4-13
Preventive Maintenance	4-14
Predictive Maintenance	4-15
4.5.3 Maintenance Action and Frequency Selection	4-16
4.5.4 Scheduling	4-16
4.6 Maintenance Procedures	4-17
4.6.1 Procedure Development and Writing	4-17
4.6.2 Procedure Verification	4-18
4.6.3 Procedure Validation	4-18
4.6.4 Procedure Approval	4-18
4.6.5 Procedure Use	4-19
4.7 Planning, Scheduling, and Coordination of Maintenance	4-20
4.7.1 Planning for Maintenance Activities	4-20
Planning Group Organization	4-20
Planning Group Responsibilities	4-20
4.7.2 Scheduling Maintenance Activities	4-21
Control of Work Backlog	4-21
Work Priority	4-21
4.7.3 Coordination of Maintenance Activities	4-22
4.7.4 Outage Planning, Scheduling, and Coordination	4-22
4.8 Control of Maintenance Activities	4-23
4.8.1 Work Control Procedure	4-23
4.8.2 Work Request	4-23
4.8.3 Supervision of Maintenance Activities	4-24
4.8.4 Review of Completed Work Requests	4-24
4.8.5 Temporary Repairs	4-25
4.8.6 Control of Nonfacility Contractor and Subcontractor Personnel	4-25
4.9 Post Maintenance Testing	4-26
4.9.1 Post-Maintenance Test Requirements	4-26
4.9.2 Post Maintenance Test Program Scope	4-26
4.9.3 Post-Maintenance Test Control	4-27
4.9.4 Post-Maintenance Test Performance Documentation, and Acceptance	4-27
4.10 Procurement of Parts, Materials, and Services	4-28

WHC-SP-1009, Rev. 0

4.10.1	Procurement Policy and Procedures	4-28
4.10.2	Procurement Initiation	4-29
4.10.3	Procurement Control	4-29
4.10.4	Services	4-30
4.11	Material Receipt, Inspection, Handling, Storage, Retrieval, and Issuance .	4-31
4.11.1	Receipt and Inspection	4-31
4.11.2	Handling	4-32
4.11.3	Storage Material and Equipment	4-32
4.11.4	Retrieval and Issuance	4-33
4.12	Control and Calibration of Measuring and Test Equipment	4-34
4.12.1	Identification	4-34
4.12.2	Calibration	4-34
	Calibration Standards	4-35
	Calibration Procedures	4-35
	Calibration Frequency	4-35
	Functional Checks	4-35
4.12.3	Control	4-36
	Storage	4-36
	Uncalibrated M&TE	4-36
	M&TE with Limited Use	4-36
	Issue and Recall	4-36
	Contaminated M&TE	4-37
4.12.4	Evaluation	4-37
	Out-of-Calibration and Defective M&TE	4-37
	Performance Trending	4-37
4.13	Maintenance Tools and Equipment Control	4-38
4.13.1	Storage and Issuance	4-38
4.13.2	Tool and Equipment Maintenance	4-39
4.13.3	Use of Special Tools and Equipment	4-39
4.14	Facility Condition Inspection	4-40
4.14.1	Standards	4-40
4.14.2	Training	4-40
4.14.3	Procedures	4-41
4.14.4	Scope of Inspections	4-41
4.14.5	Inspection Program Elements	4-41
4.14.6	Reporting Deficiencies	4-42
4.14.7	Deficiency Follow-up	4-43
4.15	Management Involvement	4-44
4.15.1	Management Involvement	4-44
4.15.2	Performance Indicators, Goals, and Objective Results	4-44
4.15.3	Feedback	4-45

WHC-SP-1009, Rev. 0

4.15.4	Program Reviews	4-45
	Assessment of Facility Condition and Worker Practices During Maintenance	4-46
	Assessment of Maintenance Training	4-46
	Assessment of Procurement Activities	4-46
	Assessment of Measuring and Test Equipment	4-46
4.16	Maintenance History	4-47
4.16.1	Program Development	4-47
	Equipment Identification	4-47
	Data Identification	4-47
4.16.2	Data Collection	4-48
4.16.3	Program Use	4-48
4.17	Analysis of Maintenance Problems	4-49
4.17.1	Information Collection	4-49
4.17.2	Event Analysis	4-49
4.17.3	Cause Determination	4-50
4.17.4	Corrective Action	4-50
4.17.5	Corrective Action Follow-up	4-51
4.17.6	Generic Follow-up	4-51
4.18	Modification Work	4-52
4.18.1	Maintenance Program Interface with Modifications	4-52
4.18.2	Temporary Repairs or Temporary Modifications	4-52
4.19	Additional Maintenance Management Requirements	4-53
4.19.1	Seasonal Facility Preservation Requirements	4-53
5.0	DEVIATIONS REQUESTED WITH SUPPORTING RATIONALE	5-1
6.0	IMPLEMENTATION SCHEDULE	6-1
7.0	BIBLIOGRAPHY	7-1

LIST OF TERMS

ALARA	As Low As Reasonably Achievable
CBRS	Component Based Recall System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	Department of Energy
EASF	Environmental Archive Storage Facility
EDRTS	Environmental Data Remedial Tracking System
EPA	Environmental Protection Agency
JCS	Job Control System
LAN	Local Area Network
M&TE	Measuring and Test Equipment
MEL	Master Equipment List
MIP	Maintenance Implementation Plan
MLSF	Mobile Laboratory Storage Facility
OJT	On-the-Job Training
PFP	Plutonium Finishing Plant
PM	Preventive Maintenance
RCRA	Resource Conservation and Recovery Act
RSME	Recall Systems Maintenance Engineering Environmental Archive Facility
SAR	Safety Analysis Report
SEL	Safety Equipment List
WHC	Westinghouse Hanford Company
WSCF	Waste Sampling and Characterization Facility

1.0 EXECUTIVE SUMMARY

This Maintenance Implementation Plan has been developed for maintenance functions associated with the Waste Sampling and Characterization Facility (WSCF). This plan is developed from the guidelines presented by Department of Energy (DOE) Order 4330.4A, Maintenance Management Program (DOE 1990), Chapter II.

The objective of this plan is to provide baseline information for establishing and identifying WHC conformance programs and policies applicable to implementation of DOE order 4330.4A guidelines. In addition, this maintenance plan identifies the actions necessary to develop a cost-effective and efficient maintenance program at WSCF.

The WSCF is a new facility and maintenance activities are mainly going to be performed by existing maintenance organizations within Westinghouse Hanford Corporation (WHC). Maintenance performed at WSCF will mostly be through the 222-S Laboratory maintenance organization. The 222-S maintenance organization is supporting WSCF through quality analytical and process chemistry maintenance services.

Comparison of the 222-S Laboratory maintenance program to DOE Order 4330.4A has been performed in WHC-SP-0842, Maintenance Implementation Plan (MIP) for the 222-S Laboratory. This WSCF Maintenance Implementation Plan will expand on the referenced 222-S MIP and provide the interface requirements and responsibilities as they apply specifically to WSCF. Assessment of the 222-S maintenance program performed by MIP (WHC-SP-0842) identified some deficiencies. These deficiencies were addressed and an implementation plan was detailed to correct these deficiencies. A review of the items identified in the maintenance implementation schedule against new site procedures and changes to existing programs and policies, has shown that most of the concerns identified in the 222-S MIP have been corrected. Those items that still remain outstanding are not addressed in this procedure as an assessment of maintenance practices and programs can not be performed against a facility that is not functioning within a maintenance environment at this time. An attempt to assess the maintenance program at the time of startup shall be made with the understanding that this document will have to be reviewed and updated as necessary to reflect actual programs and practices. This document provides an implementation schedule which has been developed for items considered to be deficient or in need of improvement.

Comparison of DOE Order 4330.4A and the 222-S Laboratory maintenance program and program application to WSCF is detailed in Section 4.0 of this plan. The discussion section as applied to WSCF implementation has been developed from a review of programs and practices utilizing the graded approach. Biennial review and review as significant programmatic and mission changes shall be made. This document shall be revised as necessary to keep this document current and in compliance with DOE requirements as they affect WSCF.

2.0 INTRODUCTION

2.1 Facility Complex Description

The Waste Sampling and Characterization Facility (WSCF) complex consists of the main structure (WSCF) and four support structures located in the 600 Area of the Hanford site east of the 200 West area and south of the Hanford Meteorology Station. WSCF is to be used for low level radiation analysis, less than 1 mRem. The Laboratory will have low level counting equipment for gaseous, soil, and liquid sample analysis. In particular, this facility will be used to perform Resource Conservation and Recovery Act (RCRA) of 1976 and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 sample analysis in accordance with U.S. Environmental Protection Agency Protocols, and room air and stack monitoring sample analysis. The samples to be analyzed will contain very low concentrations of radioisotopes. In fact, most confinement efforts are directed at keeping contamination out of the laboratory rather than confining it to the laboratory. The main reason that WSCF is considered a Nuclear Facility is due to the storage of samples at the facility.

2.1.1 WSCF is divided as follows:

The Main facility consists of:

1. An Administrative support area, consisting of offices, conference room, computer area, lunchroom and change rooms are located on the main floor.
2. A nuclear Spectroscopy Laboratory is located below the Administrative Support Area but is connected to the laboratory area by means of stairs and elevators.
3. Laboratory "A" for sample preparation and waste handling.
4. Laboratory "B" for organic and inorganic analysis.

The structures that will support WSCF are described below:

1. The Environmental Data Remedial Tracking System Facility (EDRTS) will provide a support facility for computer data center, a communications room, temporary file storage, sample data quality center, and a sample records workroom.
2. The Environmental Archive Storage Facility (EASF) will provide modular temperature controlled chambers for storage of samples along with storage of samples that do not require cool storage.
3. The Mobile Laboratory Storage Facility (MLSF) is designed to house five mobile laboratory vehicles and provide office space, a calibration and laboratory equipment room, storage areas, lunch room, and rest rooms.

4. WSCF Support Facilities:

- a. A covered slab for the storage of full and empty compressed gas bottles and general storage.
- b. Solid Waste Storage building to provide temporary (<90 days) storage of containerized laboratory wastes.
- c. Underground Waste Storage Tanks. All sinks and hood drains from the laboratories shall be routed to two 1000 liter storage tanks and pumped out at less-than-90-day intervals.

The laboratory will have low level counting equipment for gaseous, soil, and liquid sample analysis. Portal monitors are utilized for egress control of radioactive controlled areas and building egress, along with survey stations where required. HVAC and filtration of sample areas is provided through HEPA filter systems and exhaust system control. A stack monitor is installed to monitor all stack emissions. There are two separate drain systems, one for normal drainage and the other is a closed system that provides the drain system for the sample areas. The sample and materials receiving area will screen all incoming samples to assure that they are within the guidelines of the WSCF mission and also to segregate and control contamination within WSCF.

2.2 Mission

The WSCF Complex will be used primarily for the analysis of low level and nonradioactive samples that are required for compliance with the requirements of environmental regulations and U.S. Department of Energy, (DOE), Orders. In particular, this facility will be used to perform Resource Conservation and Recovery Act (RCRA) of 1976 and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 sample analysis in accordance with U.S. Environmental Protection Agency (EPA) protocols, and room air and stack monitoring sample analysis.

2.3 History/Scheduled Life

WSCF construction is scheduled to be completed in April 1994. This complex is being developed to support low level sample analysis in conjunction with the tri-party agreement. The scheduled life of the facility is projected to be for 30 years and is built and designed for easy decommissioning.

3.0 DOE ORDER 4330.4A REQUIREMENTS

3.1 Maintenance Management Program Scope

The Maintenance Management Program for the WSCF encompasses all facilities and auxiliary buildings associated with the WSCF Complex. Maintenance activities associated with the WSCF shall be provided for, by the 222-S maintenance organization. These activities, whether for building upkeep or for repair, calibration and/or rework of analytical instrumentation or laboratory equipment, shall be performed by the 222-S maintenance organization. A Master Equipment List (MEL), reference section 4.0, is presently being developed, as part of the design effort, as per the requirements of DOE Order 4330.4A for WSCF.

3.2 Maintenance Program Requirements

System and component maintenance requirements are to be established based on analyses that consider safety classifications, programmatic concerns; risk assessments of the facility, system, and component; requirements derived from technical specifications or Operations Safety Requirements; and also operating experiences and maintenance history as they are developed.

3.3 Self-Assessment Program

A self assessment program has been developed for 222-S maintenance. This self-assessment program is to be utilized at WSCF on an as needed basis to evaluate the WSCF maintenance program. As this is a new facility, an assessment of existing maintenance practices and policies is not required. Assessments of the maintenance activities at WSCF shall be performed when deemed appropriate or when major changes to maintenance policy and practice so warrants or as required by the Order (every two years). An attempt shall be made within this document to provide a projected assessment of the maintenance program as it is expected to be at time of startup. During startup and as the maintenance program is implemented, this document shall be reviewed and any necessary revision will be made at that time.

3.4 Graded Approach Strategy

"Graded Approach" is defined as the depth of detail required for implementation and the magnitude of resources expended for a particular maintenance management element.

3.4.1 Overall Strategy and Basis

At 222-S Laboratory a graded approach is used to identify the depth of detail and the level of commitment required to ensure safe and reliable operations, environmental compliance, programmatic mission, and facility preservation. The WSCF maintenance program shall be performed under the 222-S program and will comply to the same requirements and philosophies. Personnel and public safety, availability of funding, operational safety/reliability, environmental safety/compliance, safeguards and security, programmatic mission, and other facility specific requirements are to be considered when work is prioritized and performed.

At WSCF a Master Equipment List (MEL) and a Safety Equipment List (SEL) are being developed to provide designation and categorization of equipment and components as they apply to safe operation and shutdown of the facility. Upon completion they will be examined to ensure that all appropriate equipment has been identified. Maintenance activities initiated and procedures developed as a result of the safety classification will ensure that appropriate levels of maintenance have been applied.

3.4.2 Strategy for Safety Related Items

System and equipment safety classification and risk categories are assigned in accordance with established Westinghouse Hanford procedures and criteria. These categories support a graded approach to maintenance activities which include assignment of level of review and approval, work control, procedural detail and requirements, documentation, historical records, oversight, and methods of verification and validation. The philosophy for assignment of work priorities and allocation of resources to facility maintenance activities is for correction of discrepancies having a direct impact on facility and personnel safety; over maintenance on items not required for safe operation, or on items considered enhancements or plant betterment.

4.0 U.S. DEPARTMENT OF ENERGY ORDER 4330.4A CHAPTER II REQUIREMENTS

4.1 Evaluation of Compliance Elements

The Hanford Site has existing programs and administrative guidelines which provide for control and implementation of a maintenance program conforming to DOE Order 4330.4A. Maintenance activities at WSCF shall be performed in accordance with these existing documents and procedures. This Maintenance Management Plan will correlate the DOE requirements to the existing program, and where appropriate define any special maintenance program deviations and/or special program activities analogous to WSCF.

4.2 Maintenance Organization and Administration

The organization and administration of the maintenance function should ensure that a high level of performance is achieved through effective implementation and control of maintenance activities. Facility policies should reflect striving for excellence in facility maintenance and operation.

4.2.1 Maintenance Organization Policies

Objective: To establish and communicate policies, procedures, and standards for the administration, implementation and control of maintenance activities.

Discussion: The WSCF Manager shall have the responsibility for both maintenance and operational activities at WSCF. The required maintenance activities are accomplished by the PFP/222-S maintenance organization working through the 222-S work control center.

The 222-S Maintenance Manager should provide for the necessary interface within the 222-S Laboratory maintenance organizations and to other external organizations involved in maintenance activities at WSCF. The 222-S Lab maintenance personnel shall perform maintenance activities as required at WSCF. The 222-S Operations Manager will be responsible for scheduling and prioritizing maintenance activities at WSCF. All maintenance will be performed per the requirements of the existing 222-S Laboratory Maintenance guidelines, applicable site procedures, and the JCS program.

Improvement: The WSCF is a new facility with a maintenance program that is being implemented utilizing existing WHC programs and policies. Existing maintenance policies are in place and a need for any additional policies has not been identified at this time. Prior to WSCF startup the Manager PFP Maintenance shall review the maintenance program and determine if any changes are necessary to the program before startup. This document shall be revised if any additional requirements are identified.

4.2.2 Maintenance Strategy

Objective: To establish an integrated approach (including all affected organizations) in performance of maintenance activities which utilizes strategic planning to establish specific goals for the maintenance program.

Discussion: Working Relationships

The 222-S Maintenance Manager shall supervise maintenance activities and coordinate any interface activities between cross discipline organizations required while performing maintenance at WSCF.

Authority, responsibility, and accountability for support organizations will be governed by WHC-IP-0889 as applicable to the maintenance organization.

Control of maintenance activities will be performed by the 222-S Work Control Center and the JCS as directed by the maintenance organization.

Discussion: Long Range Planning

The WSCF Facility Manager is responsible for reviewing long-range planning of major maintenance activities and facility outages, as applicable. A scope for funding and staff resources to meet the needs of the maintenance program will then be provided for, through budget requests and additional funding as required.

The Manager PFP & 222-S Laboratory Maintenance shall monitor staffing and resource requirements to assure that all WSCF maintenance tasks can be supported. If any additional training is required to support a task, the Manager will allocate time for training.

The 222-S Maintenance Manager shall review scheduling requirements of facility activities to ensure that adequate staffing is available during periods of anticipated facility needs. Also the manager will provide to management justification for additional personnel and training.

Improvement: A program shall be developed which will identify and establish long-range goals for WSCF maintenance. The Manager PFP & 222-S Laboratory Maintenance shall review this program to ensure that these goals and objectives are in agreement with those goals and objectives approved by operations. Additional funding to support any long range plans shall be identified and where appropriate the schedule should reflect this change in budget.

4.2.3 Staffing Resources

Objective: To assemble and maintain a maintenance organization staff selected to prescribed qualification criteria commensurate with the facility mission(s), and maintaining the level of skill for maintenance personnel through training and incentive programs.

Discussion: The Manager PFP & 222-S Laboratory Maintenance and Manager 222-S Lab Maintenance shall screen personnel to assure that the skill level of the individual craftsman, is commensurate with the risk and complexity of the assigned activities. The maintenance manager shall provide for assessment of maintenance personnel in accordance with existing site procedures.

A periodic review of maintenance personnel training and performance shall be performed by the applicable 222-S Maintenance Manager and results forwarded to the Manager PFP & 222-S Laboratory Maintenance.

The qualifications for maintenance personnel are defined by existing site procedures and the 222-S Maintenance Training Plan and ensure that personnel are trained and capable of performing work at nuclear facilities.

The WSCF Facility Manager shall review staff augmentation requirements to support outages and assign individuals to review the qualifications of augmentation personnel to assure that they will adequately provide the necessary and timely support to the facility.

The Manager PFP & 222-S Laboratory Maintenance shall review personnel performance and productivity, along with manager recommendations, to ensure that qualified maintenance personnel are utilized. Training that is designed to assist deserving individuals in career progression assignments and activities shall be made available through existing WHC training programs.

Improvement: An evaluation of expected personnel resources shall be made, and provisions for additional personnel will be identified. If additional resources are required, the Manager PFP & 222-S Laboratory Maintenance shall adjust man-loading if resources are available.

4.2.4 Goals, and Objectives

Objective: Establish maintenance goals to monitor maintenance activity progress, detect development of trends (favorable and unfavorable), improve performance, create a safe working environment, and measure the overall maintenance program effectiveness.

Discussion: Maintenance goals and objectives have been defined in WHC-IP-0889 for the 222-S maintenance organization. WSCF shall be committed to support the goals and objectives of the 222-S maintenance organization.

Improvement: Specific goals for the maintenance department and established performance indicators for continued monitoring shall be periodically reviewed and updated for WSCF.

4.2.5 Accountability

Objective: To monitor personnel in the performance of their assigned responsibilities and administer recognition or disciplinary actions as appropriate to individual performance.

Discussion: Existing site procedures provide for performance reviews and critiques of maintenance personnel. The 222-S Maintenance Supervision shall perform this task at WSCF on a timely basis.

Improvement: The existing WHC program satisfies the intent of the DOE order. Periodic review is performed and additional requirements will be identified and incorporated into the program.

4.3 Training and Qualification

A maintenance training and qualification program consistent with DOE Orders 5480.5, 5480.6, 5480.20, and 5480.18A has been established and is controlled by WHC-CM-2-15. WSCF maintenance personnel shall be trained and qualified under the Maintenance Training Program requirements specified in WHC-IP-0889.

4.3.1 Responsibilities

Objective: Establish a maintenance training program with a clear definition of requirements and responsibilities for development and implementation. Program development should include input from maintenance managers and supervisors and be closely coordinated with the training organizations.

Discussion: The responsibility for establishing, maintaining, and implementing the maintenance training programs shall be as defined in WHC-CM-2-15, "TRAINING ADMINISTRATION MANUAL" and WHC-IP-0889. The Manager PFP maintenance is responsible for coordinating the training program between the 222-S maintenance organization and the WHC training organization. This shall be accomplished in accordance with existing site procedures and WHC-CM-2-15.

Improvement: A formal training program for skills training specific to the job position has been developed. Specific WSCF skills shall be identified and the training program shall provide for these specialized skills. Periodic review shall be performed and any enhancements shall be made.

4.3.2 Maintenance Training Programs

Objective: Maintenance training programs should include courses for all functional aspects of the maintenance activity (e.g., management, planning, engineering, support functions) goals for the maintenance program.

Discussion: Maintenance training programs that pertain to managerial, supervisory, planner/scheduler, engineering, warehousing, craft positions, contractor personnel, and other positions, as deemed necessary, shall be accomplished in accordance with WHC-CM-2-15 and WHC-IP-0889.

Improvement: Training requirements for personnel who perform functional maintenance activities is accomplished according to existing WHC procedures and programs. The training records of these personnel shall be reviewed prior to startup, and any additional training shall be provided for.

4.3.3 Training Schedules and Support

Objective: Training lessons must be provided that are compatible with the individual's skills and abilities. Schedules should be coordinated between maintenance managers and training organizations to ensure availability of instructors, facilities, and support requirements as well as availability of trainees.

Discussion: The designated 222-S Maintenance Manager shall ensure training implementation is coordinated between the maintenance and the training organization, and the PFP/222-S Training Coordinator to prepare training schedules, determine who should attend, and ensure qualified instructors are available to teach the courses.

Qualification of instructors shall be controlled by WHC site training Department in accordance with WHC-CM-2-15.

Improvement: The 222-S Maintenance Manager shall review the training records prior to startup and schedule any additional training which may be required.

4.3.4 On-the-Job Training

Objective: Formal OJT programs defining specific requirements for final qualification of personnel are outlined in WHC-IP-0889. The OJT programs shall be conducted by qualified OJT trainers in accordance with approved training plans.

Discussion: The Manager PFP & 222-S Laboratory Maintenance shall manage the formal program of on-the-job training (OJT), in which facility personnel achieve learning objectives through practical hands-on training conducted within the job environment.

The 222-S Maintenance Manager shall verify that OJT is conducted in accordance with formally defined training programs that specifically identify items the trainee must accomplish. The manager shall also verify that only qualified personnel who have successfully qualified as OJT Trainers, are providing OJT.

The 222-S Maintenance Manager shall verify that trainees independently perform maintenance only on facility equipment for which they are qualified, or under direct supervision of a qualified journeyman or manager.

Improvement: The WSCF OJT program shall be developed on an as needed basis as it becomes apparent what lab equipment and which facility items will need additional OJT requirements. This training shall be implemented and controlled by the 222-S Lab Maintenance Manager.

4.3.5 Qualifications

Objective: Maintenance management shall review training records and verify that all appropriate testing and/or interviews have been successfully completed before qualification of individuals for a given task.

Discussion: The Manager PFP & 222-S Laboratory Maintenance shall establish adequate records which verify qualification standards and evaluation methods to guarantee trainee competence, this should include contract personnel. All qualification approval shall be documented and maintained for historical record.

The Manager PFP & 222-S Laboratory Maintenance shall be directly involved in approving and periodically reviewing the maintenance training program.

Improvement: The current program for 222-S Lab Maintenance organization complies with existing DOE Order requirements. WSCF management shall continue to periodically monitor this program for conformance. There is no improvement required at this time.

4.3.6 Training in Root Cause Analysis

- Objective:* An appropriate number of individuals shall be trained in principles and methods of root cause analysis and various approaches to cause and effect analysis. Individuals shall be able to support maintenance needs and schedules.
- Discussion:* Representative WHC maintenance managers, supervisors and others trained in the principles and the methods of root cause analysis will be called upon to perform this service. When needed, this team assembles and provides an independent determination of cause and effect. Results are documented and a resolution is presented for further review.
- Improvement:* The current program for 222-S Lab Maintenance organization complies with existing DOE Order requirements. WSCF shall have personnel trained in root cause analysis made available to them through 222-S Labs when required. Additional WSCF personnel shall be utilized on an as needed basis. WSCF management shall continue to periodically monitor this program for compliance. There is no improvement required at this time.

4.3.7 Training Program Approval, Effectiveness, and Feedback

- Objective:* The maintenance manager participates in the review and approval of the maintenance training program and training topic lesson plans. Performance of maintenance personnel is monitored for evaluation of training effectiveness, and personnel feedback is used in the effectiveness evaluation.
- Discussion:* The Manager PFP & 222-S Laboratory Maintenance is responsible for systematically reviewing training programs to ensure that trainees develop the required skills and knowledge.
- Improvement:* WSCF training records shall be reviewed before startup by the Manager PFP Mechanical Maintenance/ 222-S Lab Maintenance. Improvement in the training program, if any, shall be identified at this time.

4.3.8 Management and Supervisory Training

Objective: A formalized program is in place to develop and maintain management and supervisory skills. Training provided addresses topics (e.g., personnel interfacing, communications, assessments) necessary for effective management and team building. The training program should consider support of career progression for entering the supervisory and management field.

Discussion: The training department shall provide management and supervisory training including generic areas such as managerial and supervisory skills, accountability, assessment and observation of routine activities, communication skills, teamwork, and company management philosophies. Position-specific training is provided to first-line supervisors. All training is conducted in accordance with WHC-CM-2-15 and other existing site procedures.

Improvement: A review of management and supervisory training shall be performed, and any additional training shall be identified. Present training conducted by the training department is sufficient to meet the requirements of the DOE Order. No improvement is required at this time.

4.4 Maintenance Facilities, Equipment, and Tools

Maintenance facilities, equipment, and tools should efficiently support facility maintenance and maintenance training.

4.4.1 Facilities

Objective: Shop facilities are designed with a high consideration of industrial safety and convenience to the activities they support. Appropriate environmental control systems are provided, adequate support equipment, storage and lay-down areas are available, and controls are in place for facility use.

Discussion: **Shops and Satellite Work Areas**

A small maintenance area is provided for personnel and maintenance activities at WSCF. This area will be equipped with electrical power and pneumatic supplies for bench testing and troubleshooting. The shop will be multi-disciplined and support all maintenance personnel. Storage will be provided in the work area for tools and generic test equipment as available. Specialized tools and test equipment will be located in the shop unless size limitations require external facilities or areas. The Manager PFP & 222-S Laboratory Maintenance shall assess shop size and if needed, additional space will be provided by satellite buildings or areas.

The Manager PFP & 222-S Laboratory Maintenance and 222-S Maintenance Managers are responsible for assuring that shop layout and design is conducive to a safe and efficient working environment.

The amount and type of work being performed in the shop area will be normal day-to-day repair and servicing. Any specialized work requiring additional environmental controls such as welding, machining, high voltage, radiation control, etc.. will need to be performed at designated areas. The Manager PFP & 222-S Laboratory Maintenance or shop supervisor will assess work and determine where and under what controls the work will be performed. Additional satellite work areas and stations will be provided for once a need is determined and funding becomes available.

***Discussion:* Lay-down and Staging Area**

Lay-down and staging areas will be provided for by the facility manager once a need for these areas becomes apparent. These areas will be segregated according to radiological controls, hazardous materials, application, security requirements, and any other consideration which may become apparent. All areas shall be clearly marked and administratively controlled.

***Discussion:* Storage Facilities**

Storage facilities for supplies and parts are provided for within the facility and on the facility grounds on an as needed basis.

Specialized storage for radiological control is identified and will be controlled through WHC-CM-4-10, "Radiation Protection", section 11.0 and other existing site requirements and procedures.

Storage of flammable and hazardous materials will be performed in accordance with WHC-CM-4-3, "Industrial Safety Manual", and other existing site procedures.

***Discussion:* Temporary Facilities**

A radiological controlled storage facility is provided for at WSCF. This facility is located external to the main building and will be controlled in accordance with the applicable section of WHC-CM-4-10 for low level radiation. The level of radiation and contamination will be controlled and minimized by the controls in place at the receiving dock. The receiving dock shall provide for pre-screening of incoming samples to assure contamination and radiation levels are within the guidelines of WSCF.

***Discussion:* Decontamination Facilities**

Decontamination of equipment, and tools, shall be performed on an as needed basis. All contaminated equipment and tools shall be controlled by WHC-CM-4-10.

Improvement: At the time of startup it is expected that the need for additional storage areas and other maintenance areas will become apparent. At that time, an assessment shall be made and any enhancements shall be provided for that are deemed appropriate. There is no need for any improvement at this time.

4.4.2 Tool and Equipment Storage

Objective: Storage facilities are in appropriate proximity to shops and work areas to support maintenance efficiency. Appropriate environmental controls are in place for personnel and equipment protection.

Discussion: Tool and equipment storage will be provided for by the Maintenance organization. Any special tool and equipment storage will be identified as the need becomes apparent. The 222-S Maintenance Manager shall address any need for additional storage space to the facility manager. The facility manager shall evaluate the need, and if appropriate, provide the maintenance department with additional storage facilities.

Improvement: Develop proper storage areas in close proximity of the work areas and setup proper storage cabinets in the radiological controlled area as determined by evaluation of the areas after startup.

4.4.3 Office Equipment

Objective: Office equipment necessary to support an efficient maintenance program is available (e.g., furniture, computers, communications, reproduction).

Discussion: Adequate communication, calculation, reproduction, and other office equipment shall be provided for by WSCF facility management.

The computer department shall ensure that adequate terminal and interface hardware are provided for at WSCF. LAN systems and file server requirements shall be provided for.

Improvement: Computer hardware and software along with other appropriate office equipment shall be procured and installed on an as needed basis as office space becomes available. Most equipment shall be moved from existing areas. Any additional office equipment required shall be procured as funds become available.

4.5 Types of Maintenance

A proper balance of corrective and preventative maintenance should be employed to provide a high degree of confidence that facility equipment degradation is identified and corrected, that equipment life is optimized, and that the maintenance program is cost effective.

4.5.1 Master Equipment List

Objective: Develop (and Maintain) a MEL for use in identifying equipment safety classifications and maintenance program scope, and development of the equipment history file.

Discussion: A detailed Master list of both safety-related and non-safety-related equipment, components and structures shall be developed from the SAR and other design documents, and included in the WSCF maintenance program. Special tools and equipment will be included in the Safety Equipment List as required. The cog engineer shall review any additions to the MEL and control additions through the ECN program.

Improvement: The MEL shall be developed prior to startup. A review of the MEL shall be conducted prior to operations to determine if it is complete and accurate. Any required changes shall be made prior to operation of the WSCF.

4.5.2 Types of Maintenance

Objective: Develop a maintenance program that establishes an appropriate, and cost effective, balance of preventive, predictive, and corrective maintenance to minimize equipment downtime and provide a high degree of confidence that facility equipment degradation is identified and corrected.

Discussion: **Corrective Maintenance**

WSCF maintenance personnel shall perform all corrective maintenance activities in accordance with existing site procedures and the administrative guidelines of WHC-IP-0889. Corrective maintenance shall be documented and controlled in accordance with JCS WHC-CM-8-8. Feedback to the cog engineer shall be through the JCS program and maintenance supervision. The Cog engineer will then evaluate the preventive maintenance program for effectiveness and change it where necessary.

***Discussion:* Preventive Maintenance**

The Manager PFP & 222-S Laboratory Maintenance shall implement an effective preventive maintenance program that includes systems and equipment that affect safe and reliable facility operation. As part of the maintenance surveillance program, the Manager PFP & 222-S Laboratory Maintenance shall ensure functional tests of installed equipment and/or systems (such as standby equipment or non-operating equipment scheduled for rotation) are conducted and documented. This should be performed as part of post maintenance testing activities and documented on the JCS.

Preventive maintenance is performed at predetermined and scheduled intervals, as prescribed by the Cog engineer, and seeks to maximize equipment availability. Preventive maintenance documentation provides a record of activities performed, data collected, and, where appropriate, the "as-found" and "as-left" condition of the equipment, and supplies this information to the JCS and Component Based Recall System.

The maintenance department shall acquire trending data as part of the maintenance surveillance program for long-term performance evaluations, such as bearing temperatures, pump speed, and vibration data.

A program for calibration and servicing of specialized laboratory equipment shall be integrated into the PM program. The Cog engineer shall be responsible for determining the type of PM and the frequency for performance.

Discussion: **Predictive Maintenance**

Through the status of the JCS, and equipment history records, the need for preventive maintenance is identified in advance of equipment failure. The Manager PFP & 222-S Laboratory Maintenance shall set up a program of data gathering which shall provide information for analysis, trending, and actions needed in advance of equipment failure. The predictive maintenance program shall utilize the equipment history program and provide information to the preventive maintenance program. When root cause analysis is performed, the resultant information should be fed back into the predictive maintenance program through existing administrative guidelines and entered into the historical record.

Predictive Maintenance procedures should be developed when in-process monitoring is required on equipment. These procedures should provide for establishment of proper conditions for monitoring, system configuration, and operating parameters to help ensure that the data collected is comparable and trendable. The Cog Engineer shall specify where and what type of predictive maintenance is required.

The Cog Engineer shall analyze and review predictive maintenance data to ensure that the data collected may be successfully used to predict and address incipient failures.

Improvement: A review of WSCF shall be performed prior to startup to verify that equipment is properly identified and can be ergonomically maintained. The existing maintenance program at WHC is adequate to maintain a maintenance program conforming to DOE Orders and guidelines. Prior to startup a review of the existing program shall be made as to how it is implemented at WSCF. At this time any improvements shall be identified and corrective action or program enhancement shall be implemented.

4.5.3 Maintenance Action and Frequency Selection

Objective: Maintenance frequencies are established to satisfy code and specification requirements, and to ensure optimum equipment operating life and performance.

Discussion: The Cog engineer shall review the WSCF equipment history periodically to ensure that PM's and their frequencies are used to improve equipment performance.

The Manager PFP & 222-S Laboratory Maintenance shall evaluate maintenance actions and their frequencies to ensure code and regulatory requirements are being met.

A preventive maintenance program shall be modified as necessary from review and analysis of historical data by the Manager PFP & 222-S Laboratory Maintenance. This shall ensure that the maintenance program is cost effective and that required maintenance intervals are adequate. Any change to the maintenance program shall be documented.

Improvement: Prior to startup the cog engineer shall identify calibration frequencies for all applicable equipment based upon vendor recommendations, impact level, and historical data.

4.5.4 Scheduling

Objective: Preventive maintenance activities are scheduled according to assigned frequencies and in conjunction with corrective maintenance of the same equipment or with other activities related to equipment.

Discussion: The 222-S Maintenance Manager shall review the JCS periodically to determine if a proper balance of preventive to corrective maintenance activities are being performed. This review shall determine when it may be advantageous to perform maintenance activities on related equipment, loop components, or on equipment in close proximity. This will ensure that equipment maintenance is optimized, productivity is increased, and facility down time is minimized.

Improvement: A PM program shall be established based on vendor recommendations prior to WSCF operations.

4.6 Maintenance Procedures

Maintenance procedures and other work-related documents (e.g., drawings and instructions) should be prepared and used to provide appropriate work direction and to ensure that maintenance is performed safely and efficiently. A balance of written guidance, craftsman's skills, and work-site supervision (graded approach) is required to achieve the quality workmanship essential to safe and reliable facility operation.

4.6.1 Procedure Development and Writing

Objective: Procedures are provided for performance of maintenance activities to any facility or equipment component designated as safety-related, has complex maintenance tasks, is beyond the skills possessed by the craftsman, or that presents a personnel or equipment hazard.

Discussion: The WSCF Manager shall establish the guidelines for when a procedure will need to be developed to support testing. Procedures should be developed by the maintenance engineering and the Cog Engineer for, and used, in all work that could result in a significant process transient, degraded facility reliability, personnel or equipment hazard, or when the complexity of the work deems a procedure appropriate. Procedures shall also define preventive maintenance activities.

The Manager PFP & 222-S Laboratory Maintenance shall ensure that all procedures are developed and formatted in accordance with WHC-IP-0889, and departmental desk instructions.

Improvement: Maintenance procedures for preventive, predictive and corrective maintenance shall be developed. Procedures shall be developed, utilizing the graded approach, before associated maintenance activities are to be performed. Periodic assessment of procedure utilization based upon recall shall be performed and any unnecessary maintenance procedures shall be identified and the appropriate action taken.

4.6.2 Procedure Verification

- Objective:* Procedures are reviewed for format and technical accuracy. Format used incorporates human factors principles and other administrative policies. Reviews are conducted by other than the procedure writer.
- Discussion:* The Manager PFP & 222-S Laboratory Maintenance shall ensure that all procedures are verified in accordance with WHC-CM-1-3, "Management Requirements and Procedures", MRP 5.43, "Impact Levels".
- Improvement:* Procedure validation and verification programs shall be periodically reviewed for conformance to DOE and WHC procedures and guidelines. Any enhancement to the program shall be implemented. At present the existing procedure verification program is adequate to meet the requirements of the DOE Order.

4.6.3 Procedure Validation

- Objective:* Procedures are reviewed for usability and correctness to ensure sufficient and understandable instructions are provided and are compatible to the equipment and task specified.
- Discussion:* The Manager PFP & 222-S Laboratory Maintenance shall ensure that all procedures are field validated in accordance with WHC-IP-0889.
- Improvement:* Validation of maintenance procedures is to be performed by the 222-S Labs Maintenance organization. The validation program is to be periodically reviewed and deficiencies corrected. There is no need for any improvement at this time.

4.6.4 Procedure Approval

- Objective:* Procedures are reviewed to applicable specifications and administrative procedures and approved by appropriate levels of management.
- Discussion:* The Manager PFP & 222-S Laboratory Maintenance shall ensure that all procedures are approved in accordance with WHC-CM-1-3, MRP 5.43.
- Improvement:* All procedure approvals shall be made in accordance with MRP 5.43. There are no improvements identified or required at this time.

4.6.5 Procedure Use

Objective: Procedure control is established ensuring availability and currency of the procedures to be used. Procedure compliance requirements are clearly stated, communicated, and understood by users.

Discussion: The 222-S Maintenance Manager and the JCS shall ensure that the procedures used in the field are the most current and correct revision for use. Document control shall issue and control the maintenance procedures per existing plant procedure.

The Manager PFP & 222-S Laboratory Maintenance shall ensure that a graded approach is used to provide the need for the work procedures utilized by the maintenance organization and in accordance with the requirements of WHC-IP-0889.

The Manager PFP & 222-S Laboratory Maintenance shall ensure that all procedures are changed and revised in accordance with WHC-IP-0889.

Improvement: Compliance with the DOE Order is met at the present time. Periodic reviews will be conducted to ensure continued compliance.

4.7 Planning, Scheduling, and Coordination of Maintenance

An effective system for planning, scheduling, and coordinating maintenance activities should be implemented in order to ensure that maintenance is accomplished in a timely manner, improve maintenance efficiency, reduce radiation exposure, and increase equipment availability.

4.7.1 Planning for Maintenance Activities

Objective: Establish a planning program that provides work instructions, identifies resource requirements, and coordinates support functions.

Discussion: **Planning Group Organization**

The planning activities for WSCF shall be performed by the 222-S work control group utilizing the JCS.

Discussion: **Planning Group Responsibilities**

The 222-S work control group will be responsible for all planning activities at WSCF. The planning organization will perform work activities in accordance with existing site procedures.

Improvement: The JCS and applicable site procedures comply with the DOE Order. As upgrades and enhancements to the JCS and applicable site procedures are implemented, changes shall be made to maintenance procedures and practices to reflect those changes.

4.7.2 Scheduling Maintenance Activities

Objective: All maintenance activities will be performed using a clearly defined schedule, supported by all affected organizations, tracked to maintain status, and performed according to priorities established by operations.

Discussion: **Control of Work Backlog**

Manager PFP & 222-S Laboratory Maintenance and managers should expedite work packages to assure that work is performed on schedule. Work backlog will be tracked and controlled within the JCS in accordance with the requirements of WHC-CM-8-8, "Job Control System". The Manager PFP & 222-S Laboratory Maintenance is responsible for reviewing the Backlog for work status and problem areas. The Scheduling of work packages and work activities shall be performed through the JCS, the Work Control Group, and the Manager PFP & 222-S Laboratory Maintenance.

222-S JCS activities specific to WSCF are performed in accordance with applicable sections of WHC-CM-5-4, "Laboratories Administration".

Discussion: **Work Priority**

The 222-S Work Control Group shall assign work priorities on the basis of safety and operational requirements utilizing the graded approach. This shall be controlled by the requirements of WHC-CM-8-8.

The facility manager may increase specific task work priority if deemed necessary and appropriate.

The Level 4 schedule, Plan-of-the-day, and Plan-of-the-Month shall also be used for implementing work priorities.

Improvement: A maintenance plan shall be developed within the first year of operation which will provide a schedule for major outages and maintenance evolutions for the next five year period. This plan shall be periodically reviewed and updated to show any scheduling changes and future maintenance activities.

4.7.3 Coordination of Maintenance Activities

Objective: Coordinate maintenance activities to ensure that work can be effectively accomplished.

Discussion: Routine planning meetings, including those for maintenance, are performed, and maintenance required meetings are held to ensure coordination of activities in this regard. The Manager PFP & 222-S Laboratory Maintenance and 222-S Maintenance Manager shall also provide the necessary supervision to assure that all maintenance activities are performed in cooperation and coordination with other departments.

Improvement: Compliance with the DOE Order is met at the present time. Periodic reviews will be conducted to ensure continued compliance.

4.7.4 Outage Planning, Scheduling, and Coordination

Objective: Establish program for identifying all maintenance activities to be performed during a defined facility or equipment outage and develop schedule for planning and performance of those activities.

Discussion: Outage planning is not applicable to WSCF as there are no systems or major pieces of equipment requiring advance scheduling and outage planning identified at this time.

Improvement: As major outages are identified, a program shall be established to ensure that required maintenance activities will be coordinated, statused and performed. There is no improvement required at this time.

4.8 Control of Maintenance Activities

Management directed and delegated involvement in control of maintenance activities should ensure that maintenance practices are effective in maintaining safe, efficient, and reliable facility operation.

4.8.1 Work Control Procedure

Objective: Work control is accomplished in accordance with a formal program which defines the requirements and controls for performing work. The program is used to identify all facility deficiencies, modifications, preventive maintenance and surveillance testing, avoid redundant identification of deficiencies, and post maintenance activities.

Discussion: WHC-CM-8-8 is the administrative procedure describing what work control requirements are to be adhered to at WSCF. Additional work control requirements are provided for in WHC-IP-0889 and WHC-CM-5-4.

Improvement: The WHC administrative policies and procedures applying to work control are adequate to comply with the DOE Order. There is no need for improvement at this time. However, periodic review of the program shall be performed and any cost effective changes or enhancements will be made to the work control program as required.

4.8.2 Work Request

Objective: All maintenance activities performed are controlled by the facility work control program. Work request documents clearly define work to be performed, equipment on which work is to be performed, pre (and post) requisites, and documentation requirements. Work requests are reviewed by affected organizations before release for work and upon completion of work.

Discussion: The work request process shall be controlled through the application of the JCS program in accordance with WHC-CM-8-8.

Work requests shall be reviewed in accordance with the requirements of WHC-CM-8-8 and WHC-CM-1-3, MRP 5.43.

Improvement: The present JCS complies with the DOE Order. Periodic reviews will ensure that the present system remains in compliance with DOE Orders and site policies.

4.8.3 Supervision of Maintenance Activities

Objective: Maintenance managers routinely monitor work in progress to ensure maintenance activities are conducted in accordance with facility procedures and work package instructions. Problems observed are analyzed and feedback is provided to prevent recurrence.

Discussion: 222-S Maintenance Managers shall routinely monitor work in progress to help ensure that maintenance activities are conducted in accordance with DOE and Site policies and procedures, per WHC job descriptions, WHC-IP-0889, and standard industry practice.

Improvement: The present supervisory and management overview of work activities complies with the DOE Order. Periodic review and re-assessment shall be performed to assure that compliance is maintained.

4.8.4 Review of Completed Work Requests

Objective: Completed work packages are reviewed to verify all work items, including post maintenance testing and inspections, have been completed in an acceptable manner before returning system or equipment to service.

Discussion: The building 222-S Maintenance Manager or laboratory manager shall compare the rework performed, to the post-maintenance testing or inspection result, to determine that all work is acceptable prior to returning the equipment or system to normal service, when maintenance work is performed.

The Cog Engineer, operations, or 222-S maintenance manager may request post maintenance testing in addition to post maintenance tests already specified on the work package if the scope of the work performed deems additional retesting.

The Cog Engineer shall recommend closure of the work package after review.

Improvement: The present program and policies affecting completed work packages complies with the intent of the DOE Order. Periodic

reviews of the program shall be performed to ensure continued compliance.

4.8.5 Temporary Repairs

Objective: Temporary repairs are accomplished and controlled to the same level as permanent repairs.

Discussion: Temporary changes and modifications shall be performed in accordance with the requirements of WHC-CM-6-1, "Standard Engineering Practices", and JCS. Temporary repairs or changes shall be changed to permanent repairs or official design modifications in a timely manner as required by applicable site procedures.

Improvement: The present program for changes complies with the DOE Order. There is no need for improvement at this time. Periodic reviews shall be performed to ensure continued compliance.

4.8.6 Control of Nonfacility Contractor and Subcontractor Personnel

Objective: Nonfacility contract and subcontract personnel who perform maintenance or modification work on WSCF facility systems are qualified for the work performed and trained in accordance with access requirements.

Discussion: Site procedures provide for access control and general employee training of contractor and subcontractor personnel. The 222-S maintenance organization shall assure that any additional training required for contractor or subcontractor personnel is performed and documented in accordance with site procedure. Qualification of contractor personnel shall be certified by the contractor; and verified and documented by the cog engineer before commencement of work activities.

Improvement: This existing policy is adequate to meet the intent of the DOE Order. Periodic reviews and assessments shall be performed to ensure that this policy is in compliance with DOE Orders and site policies.

4.9 Post Maintenance Testing

Post-Maintenance testing should be performed to verify that components will fulfill their design function when returned to service after maintenance.

4.9.1 Post-Maintenance Test Requirements

Objective: The work completion and retest process at WHC addresses control and documentation of retest requirements. Work requests shall provide specific instructions for test and acceptance criteria when maintenance work is performed.

Discussion: Post maintenance testing shall be conducted in accordance with WHC-CM-8-8 (JCS) Appendix Q when maintenance work has been performed and when specified by the Cog Engineer or Operations. Most repair work performed at WSCF is not going to require any post maintenance testing other than an operability test, as applicable.

Improvement: Periodic review of post maintenance testing will be performed. Any identified problems shall be addressed and program changes shall be implemented to correct any deficiencies. There is no need for improvement at this time.

4.9.2 Post Maintenance Test Program Scope

Objective: All maintenance activities are reviewed for applicability of postmaintenance testing and appropriate testing instructions (and acceptance criteria) are provided.

Discussion: Post Maintenance testing at WSCF shall be required when maintenance work is need performed.

Improvement: Periodic review of post maintenance testing will be performed. Any identified problems shall be addressed and program changes shall be implemented to correct any deficiencies. There is no need for improvement at this time.

4.9.3 Post-Maintenance Test Control

Objective: The work control program addresses control of postmaintenance testing that covers all conditions of single or multiple organization involvement and testing that is deferred until a later date.

Discussion: During work package closeout and review, retesting may be specified by operations before work package completion. If the retest can not be performed immediately and needs to be tracked, 222-S maintenance shall status and track the retest requirement per WHC-IP-0889.

Improvement: Periodic review of post maintenance testing will be performed. Any identified problems shall be addressed and program changes shall be implemented to correct any deficiencies. There is no need for improvement at this time.

4.9.4 Post-Maintenance Test Performance Documentation, and Acceptance

Objective: Post maintenance testing is performed in accordance with approved work package instructions (or preventive maintenance procedure) and completion is documented.

Discussion: The JCS shall be used as the vehicle for documenting post maintenance testing instructions unless specific test requirements have been identified. Documentation shall than be performed in accordance with work package closeout and WHC-CM-8-8 requirements. Test results shall be documented and retained as part of the maintenance history.

Upon completion the work package is reviewed for completion in accordance with Appendix R of WHC-CM-8-8 before approval.

Improvement: The existing program is adequate to meet the intent of the DOE Order. Periodic reviews and assessments shall be performed to ensure that this program is in compliance with DOE Orders and site policies.

4.10 Procurement of Parts, Materials, and Services

Controls and assessment of procurement activities are used to help ensure that proper parts, materials, and services are purchased to support maintenance activities and to meet the requirements for safe and reliable facility operation.

4.10.1 Procurement Policy and Procedures

Objective: Policies and procedures are in place governing the procurement of parts, materials, equipment, and services. Personnel responsible for procurement activities are conversant to, and comply with, defined requirements.

Discussion: Mechanisms are in place to provide for the expeditious procurement of parts and material on a high priority basis when needed, as specified in WHC-CM-6-1 and WHC-CM-2-1, "Procurement Manual and Procedures". WHC-CM-2-2, "Material's Management Manual", prescribes methods to acquire replacement parts not available through the original supplier.

The 222-S work control center or cog engineer shall be responsible for procurement of parts and materials associated with WSCF maintenance activities. The 222-S Maintenance Manager shall be responsible for procuring parts associated with shop activities and equipment.

Equipment specified in the MEL shall be assessed for spare parts requirements, and any recommended spare parts procured in accordance with applicable site procedures.

Improvement: The existing program is adequate to meet the intent of the DOE Order. Periodic reviews and assessments shall be performed to ensure that this program is in compliance with DOE Orders and site policies.

4.10.2 Procurement Initiation

Objective: Procurement activities are conducted in a timely fashion. The procurement program addresses the pre-selection and qualification of procurement sources, spare parts inventory, and cross facility use of inventories.

Discussion: Lessons learned from experience, such as lead times, parts usage, and supplier reliability, are factored into materials management and included in existing site procedures.

Topics such as storage, in-storage preventive maintenance, and shelf-life requirements are addressed in WHC-CM-2-2.

Warehouse and procurement activities such as inventory, rotation, and other warehouse functions are specifically address in existing site procedures.

Improvement: The existing program is adequate to meet the intent of the DOE Order. Periodic reviews and assessments shall be performed to ensure that this program is in compliance with DOE Orders and site policies.

4.10.3 Procurement Control

Objective: The procurement program provides for documentation and controls applicable to obtaining parts, materials, equipment, and services in accordance with the technical and quality requirements.

Discussion: The cog engineer shall approve any deviation from design specifications for parts or materials.

Warehouse personnel shall review Material and parts activity to determine possible new additions to be included in spare parts or site stores catalog.

Procurement documents (WHC-CM-2-1) provide clear and adequate technical and quality assurance requirements consistent with design specifications.

Deficient or nonconforming items are resolved in an effective and timely manner as specified by site procedures.

Quality assurance records are controlled and maintained per WHC-CM-3-5 and WHC-CM-4-2 to provide documentation for qualified parts and materials and to ensure traceability. The QA department shall perform audits , inspections or surveillances of suppliers according to QA requirements.

Improvement: The existing program is adequate to meet the intent of the DOE Order. Periodic reviews and assessments shall be performed to ensure that this program is in compliance with DOE Orders and site policies.

4.10.4 Services

Objective: A program for selection and procurement of service contracts is in place and a renewal process may be initiated to prevent periods of non-coverage. Service contracts include provisions for emergency or short notice support.

Discussion: Identification of the need for specialized services from vendors shall be made early on by the Manager PFP & 222-S Laboratory Maintenance to provide for timely submittal of bidding on, and awarding of contracts.

Improvement: This area is addressed in existing procedures and impact on WSCF shall be addressed as required. There is no need for improvement at this time. Periodic review shall be performed to ensure compliance.

4.11 Material Receipt, Inspection, Handling, Storage, Retrieval, and Issuance

All phases of receiving, inspecting, handling, storing, retrieving, and issuing equipment, parts, and materials for maintenance should be covered by effectively implemented policies and procedures consistent with the Quality Assurance Requirements of the facility.

4.11.1 Receipt and Inspection

Objective: Receipt inspections of materials and equipment is performed before acceptance for use or storage verifying items delivered conform to all procurement document requirements and are in good condition.

Discussion: WHC-CM-2-1 and WHC-CM-2-2 are prepared to specifically describe the responsibilities and techniques for receiving, inspecting, handling, storing, retrieving, and issuing equipment, parts, and materials.

Material is inspected per the requirements of WHC-CM-2-2 to ensure conformance to purchasing requirements prior to release for use and storage.

Site procedures control documentation for received material and assures that these documents are accounted for and retrievable.

WHC-CM-4-2 specifies that nonconforming items are identified with tags or labels and controlled to prevent unauthorized use.

Improvement: Site procurement and receipt inspection is presently governed by existing procedures and programs and requires no improvement at this time. Review of specific application of site procedures to WSCF receipt inspection and storage shall be made periodically. Any additional guidance shall be defined within the maintenance manual (WHC-IP-0889) for receiving material and controlling there storage at WSCF, as required.

4.11.2 Handling

Objective: Procedures are provided for items requiring special handling. Procedures include all information necessary to prevent damage.

Discussion: WHC site procedures/instructions are available for items requiring special handling.

Effective material procurement status is provided, including accurate stock records and tracking of purchase orders.

Improvement: This area is addressed in existing procedures and impact on WSCF shall be addressed as required. There is no need for improvement at this time. Periodic review shall be performed to ensure compliance.

4.11.3 Storage Material and Equipment

Objective: Materials and equipment are stored in a manner to provide maximum protection, but remain readily available for issue. Safety-related equipment is segregated from nonsafety items to prevent improper usage.

Discussion: Materials are stored, protected, and identified in accordance with WHC-CM-2-2 in a manner that provides ready availability for its intended use.

A shelf-life control program (WHC-CM-2-2) is provided for store items that are important to safe and reliable facility operation.

Safety-related and nonsafety-related materials and equipment are segregated from each other to prevent inadvertent use of the wrong category of item.

Periodic inspections of staging areas, stores, and warehouses are performed per the requirements of WHC-IP-0889.

The quality of stored equipment, parts, and materials is maintained in accordance with vendor information by appropriate means, such as environmental and shelf-life controls and preventive maintenance activities, if necessary.

Improvement: Warehouse storage complies with the DOE Order. Any on-sight storage shall be periodically evaluated for compliance to the DOE Order. Improvements to storage shall be made as the need is identified. There are no improvements identified or required at this time.

4.11.4 Retrieval and Issuance

Objective: Parts, materials, and equipment removed from storage are handled to the same requirements applied at time of receipt. A stores inventory system is in place to identify available materials and equipment and is available to using organizations, such as planning and engineering.

Discussion: Parts and materials issued for installation are properly controlled per existing site procedures. Unused parts and materials should be promptly returned to a controlled storage area. Completed work requests/orders document material traceability.

Improvement: Periodic review of the parts retrieval and issuance program for WSCF shall be performed. Unused parts and materials are to be promptly returned to a controlled storage area which shall be identified by the Maintenance organization as parts and materials are procured for WSCF. At present the program complies with the DOE Order and there is no need for improvement at this time.

4.12 Control and Calibration of Measuring and Test Equipment

The program for control and calibration of measuring and test equipment (M&TE) should be consistent with the Quality Assurance requirements of DOE 5700.6C and ensure the accurate performance of facility instrumentation and equipment for testing, calibration, and repairs.

4.12.1 Identification

Objective: Establish a program for the assignment of a unique identification number for each item of M&TE which is permanently marked or attached to the equipment and a master M&TE equipment list for use in control of the equipment.

Discussion: All M&TE devices used at WHC have unique identification numbers that accurately identify the specific devices and provide positive traceability. A master list identifying all M&TE is developed and kept current by the WHC (Standards Lab) M&TE organization.

Improvement: At WSCF there may be the need for specialized test and calibration equipment. The maintenance manager and cog engineer shall review M&TE requirements before startup, and identify the need for specialized M&TE. As these items are identified and there need is required, they shall be procured, tracked, and controlled, through the existing M&TE program. Periodic review shall be performed to ensure program compliance to DOE Orders and site procedures. There is no need for improvement at this time.

4.12.2 Calibration

Objective: Calibration of M&TE at WHC is accomplished by qualified personnel using approved procedures and standards having full traceability to the National Institute of Standards and Technology or other nationally recognized standards. Standards utilized are maintained at 222-S designated controlled storage locations.

Discussion: **Calibration Standards**

The M&TE calibration program is based on standards that are traceable to a national standard or that are recognized standards unto themselves. All traceability, administrative controls and guidelines, are already in place as part of the WHC site M&TE program. Records are maintained at the standards lab.

Discussion: **Calibration Procedures**

Procedures (WHC-CM-4-2, WHC-CM-8-2) are used to calibrate M&TE, control the performance of calibrations, provide repeatable calibrations, and provide acceptance criteria.

M&TE documentation includes records for accountability and traceability of use. A recall system is developed for recalibrations of M&TE. This system is controlled by the M&TE Standards lab. All M&TE calibrations are performed through the administrative controls and requirements of the M&TE Standards lab.

Discussion: **Calibration Frequency**

A calibration frequency that helps maintain M&TE accuracy and availability is established through the WHC M&TE administrative program and WHC-CM-4-2, "Quality Assurance Manual", section 12, "Control of Measuring and Test Equipment", requirements.

Discussion: **Functional Checks**

WHC site procedures recommend that M&TE should be functionally checked before use and this shall be performed on an as needed basis by 222-S maintenance personnel.

Improvement: The present program is in compliance with the DOE Order. Periodic review shall be performed to ensure program compliance to DOE Orders and site procedures. There is no need for improvement at this time.

4.12.3 Control

Objective: Control of M&TE is established to ensure equipment used to verify (calibrate) facility instrumentation operates properly.

Discussion: **Storage**

Control of M&TE is established by WHC-CM-4-2 section 12, WHC-IP-0889, and WHC-CM-8-2 section 205, to ensure equipment used to verify (calibrate) facility instrumentation operates properly.

Facilities at 222-S are provided to control storage, issuance, and calibration of M&TE. The 222-S Maintenance Manager shall identify storage areas at WSCF as soon as the need becomes apparent.

Any M&TE with suspected or actual deficiencies is segregated and marked to prohibit its use as required by existing site procedure (WHC-CM-8-2 section 205, and WHC-IP-0889).

Discussion: **Uncalibrated M&TE**

Any new M&TE devices are calibrated prior to use. Uncalibrated M&TE for taking data at WHC facilities are clearly identified and their use is strictly controlled by facility and site procedures (WHC-CM-8-2 Section 205). WSCF shall also follow this program.

Discussion: **M&TE with Limited Use**

M&TE devices that are not fully calibrated or usable are clearly marked to indicate their limitations and are not issued for quality work at WHC. This program shall also be adhered to at WSCF.

Discussion: **Issue and Recall**

Log IN/OUT sheets are kept for traceability by the M&TE custodian at 222-S M&TE issue. The Standards Lab has administrative procedures in place for notification of calibration due dates and M&TE recall. M&TE usage is tracked by the maintenance department utilizing the work request or on the calibration data sheet, if applicable. Other requirements for 222-S are in WHC-IP-0889.

Discussion: **Contaminated M&TE**

Contaminated M&TE is controlled per existing safety and radiological guidelines at WHC and shall also be adhered to at WSCF. Contaminated M&TE is strictly controlled to minimize the spread of contamination.

Improvement: The Manager PFP & 222-S Laboratory Maintenance and the 222-S Lab Manager shall review the M&TE program periodically for compliance. There are no improvements identified or required at this time.

4.12.4 Evaluation

Objective: Usage of M&TE is controlled and evaluated to ensure proper utilization, impact/consequence of out-of-tolerance equipment use, and equipment reliability.

Discussion: **Out-of-Calibration and Defective M&TE**

M&TE devices found out of calibration or defective receive timely evaluations to determine the validity of all measurements/tests for which they were used. This is accomplished through the review of history files controlled through the CBRS (Component Based Recall System) program controlled by RSME (Recall System Maintenance Engineering).

Discussion: **Performance Trending**

Results of M&TE calibrations are trended by the standards lab and the Cog engineer, corrective actions are determined for any M&TE reliability problems.

Improvement: The WSCF is a new facility with a maintenance program that is being implemented utilizing existing WHC programs and policies. The determination for M&TE program improvement shall be made after startup at the first program assessment required by DOE Orders. There are no improvements identified or required at this time.

4.13 Maintenance Tools and Equipment Control

Methods should be established to provide for storage, issuance, and maintenance of an adequate and readily available supply of tools and equipment and also for the development of special tools and equipment needed in the maintenance program.

4.13.1 Storage and Issuance

Objective: To ensure that an adequate supply of hand tools, common power tools, and equipment is readily available, properly stored, and controlled.

Discussion: Overall responsibility for assuring that the WSCF has proper tools to perform maintenance activities and that they are stored properly, is with the Manager PFP & 222-S Laboratory Maintenance and the 222-S Lab Manager. The maintenance manager or designee shall review the WSCF MEL and determine the need for specialized tools and/or equipment. Any specialized requirements shall be identified and steps taken to procure the equipment if required. This specialized equipment would be stored near the work site.

The Industrial Safety Manual (WHC-CM-4-3) controls the disposition of worn and defective tools along with WHC-IP-0889. The 222-S maintenance organization shall work to these controls and guidelines.

Improvement: The maintenance manager or designee shall review the WSCF MEL and determine the need for specialized tools and/or equipment prior to startup or when the need for such equipment is identified. Any specialized requirements shall be identified and steps taken to procure the equipment if required. Calibration gases and standards shall be identified and procured at this time. Existing site policies provide for an effective program to procure and maintain specialized tools and equipment and there is no need for enhancements or improvements in the program at this time.

4.13.2 Tool and Equipment Maintenance

Objective: Tools and support equipment are included in the preventive maintenance program to maintain a safe use condition and to provide necessary care to maintain its service life.

Discussion: Maintenance tools and other support equipment used at WSCF, if cost effective, shall be included in the preventive maintenance program by the 222-S maintenance organization.

Improvement: Existing WHC programs and policies provide for the care and servicing of tools and support equipment. Periodically this program shall be assessed for effectiveness and completeness. Any required improvements shall be identified and appropriate corrective actions taken. There is no program improvement required at this time.

4.13.3 Use of Special Tools and Equipment

Objective: Special tools and equipment are available and are clearly marked for their intended use. Work packages include necessary instructions for the proper use of special tools and equipment.

Discussion: Special tools, test rigs, special equipment, lifting and rigging equipment, and mockups that are required for maintenance activities at WSCF, shall be identified for their intended use by the 222-S maintenance organization.

Specific Instructions are provided to control the use of lifting and rigging equipment in DOE-RL-92-36, "Hanford Site Hoisting and Rigging Manual". The 222-S maintenance organization shall abide by these guidelines.

Improvement: The WSCF is a new facility, and the specific need for Special Tools and equipment is not apparent at this time. Once operational, an assessment shall be made to determine the need and requirements for specialized tools and equipment. There is no need for improvement at this time.

4.14 Facility Condition Inspection

Management should conduct periodic inspections of equipment and facilities to assure excellent facility condition, housekeeping, and safe and reliable operation.

4.14.1 Standards

Objective: Standards are defined and communicated to personnel responsible for the inspection and maintenance of facilities.

Discussion: WSCF Management and Maintenance Management performs inspections of all WSCF facilities on a regular basis to ensure that standards are maintained.

Improvement: At the present time, existing site procedures and programs comply with the intent of the DOE Order. As changes occur to the standards, inspectors will receive training in the new standards.

4.14.2 Training

Objective: Personnel involved in facility inspections receive instructions to establish knowledge of standards and related facility policies. Methods for determining condition status are provided for consistency of inspections and condition reporting.

Discussion: The Manager PFP & 222-S Laboratory Maintenance is responsible for communicating inspection criteria and techniques required to perform WSCF condition inspections as referenced in WHC-IP-0889. Safety inspection check sheets are available to the inspectors.

Improvement: At the present time the program meets the intent of the DOE Order. Periodic review will be conducted to ensure continued compliance.

4.14.3 Procedures

Objective: Procedures are provided defining the facility inspection program, methods of implementation, standards of condition, and means for correction of deficiencies found. Deficiencies found are evaluated for changes to the facility maintenance program.

Discussion: Existing WHC procedures and WHC-IP-0889 describe the facility inspection program and good house-keeping requirements. The vehicle for reporting and tracking WSCF deficiencies shall be provided for through the JCS.

Improvement: The present system of inspections and identification of deficiencies is well defined and in compliance with the DOE Order. Periodic reviews are required to ensure continued compliance.

4.14.4 Scope of Inspections

Objective: Inspections include detailed walkdowns of assigned areas that include remote and limited-access areas as well as the more obvious and available areas. Key individuals are included in the inspection teams with free discussion of techniques and concerns encouraged. Sufficient time is allowed to search for deficiencies rather than a quick walk through. Obvious deficiencies are investigated to the degree necessary to positively identify the source of the problem.

Discussion: Inspections are performed following established WHC procedures (WHC-IP-0889), and shall include walkdowns of WSCF maintenance areas. The inspections should be confined to the main WSCF building and all additional out buildings where activities are performed. The facility manager is responsible for ensuring that all WSCF areas and buildings are inspected on a regular basis.

Improvement: The WSCF is a new facility with an inspection program that is being implemented utilizing existing WHC procedures and policies. Before startup, inspection routes and schedules shall be created to ensure all areas requiring inspection are being inspected on a routine basis. There are no improvements identified or required at this time for the WSCF maintenance program.

4.14.5 Inspection Program Elements

Objective: Inspection assignments are scoped to ensure adequate time for thorough inspection and scheduled to minimize impact to ongoing operations of the facility.

Discussion: The Manager PFP & 222-S Laboratory Maintenance shall establish a scheduled walkdown inspection on a regular basis. This schedule shall identify the personnel assigned inspection responsibility, the area to be inspected, and any additional inspection requirements, reference WHC-IP-0889.

Improvement: The WSCF is a new facility with a maintenance program that is being implemented utilizing existing WHC programs and policies. There are no improvements identified or required at this time for the WSCF maintenance program.

4.14.6 Reporting Deficiencies

Objective: Deficiencies noted during inspection are entered into the work control program for corrective action. Significant and/or safety related deficiencies are assigned the appropriate priority and reported to the responsible facility manager. Housekeeping deficiencies are reported to the occupying organization for attention.

Discussion: Inspection results shall be documented and a report presented to the WSCF Manager. Items identified as deficient shall be tagged or identified in such a manner as to allow for easy identification that it is defective or suspect.

Improvement: The existing site program is adequate to meet the intent of the DOE Order. Periodic reassessment shall be performed on an as needed basis to ensure continued compliance. There is no need for improvement at this time.

4.14.7 Deficiency Follow-up

Objective: Reported deficiencies are monitored for timely completion of corrective actions. Recurring, generic, or long term problems are analyzed for identification of root cause. Recommendations are provided for changes to the preventive maintenance program. Periodic evaluation of inspection reports and facility conditions are made to determine program effectiveness.

Discussion: Deficiencies identified which require immediate corrective action shall have a work order initiated, the deficient equipment should be identified, and the JCS shall track the item for corrective action. The Manager PFP & 222-S Laboratory Maintenance shall be responsible for informing inspection personnel and concerned parties of deficiency resolutions in a timely manner, and tracking reported deficiencies to completion.

Improvement: Periodic review of this program shall be performed to ensure compliance. At the present time the projected program is adequate to meet the requirements of the DOE Order. There is no need for improvement at this time.

4.15 Management Involvement

To ensure the safety of DOE facility operations, DOE and contractor corporate and facility managers should be sufficiently involved with facility operations to be technically informed and personally familiar with conditions at the operating facility.

4.15.1 Management Involvement

Objective: Managers include time in their schedules for facility walkthroughs. Time is used to improve communications, facilitate feedback, and to observe work activities and condition. Walk-through observations are documented and items requiring action pursued to completion.

Discussion: The WSCF Manager and Manager PFP & 222-S Laboratory Maintenance shall include time to walk through the WSCF on a routine basis. This walk through shall be performed to improve face-to-face communication and feedback at all levels of maintenance. Due to the size of the WSCF and the types and amount of maintenance being performed, the maintenance manager shall use the walk through as a means of assessing work load and off normal duty hour maintenance coverage. The walk through results shall be documented and reviewed for short term and long term requirements as specified in WHC-IP-0889.

Improvement: The present program meets the requirements of the DOE Order; however, as changes to the DOE Order and site policies occur which impact management involvement, changes to the inspection program will be made.

4.15.2 Performance Indicators, Goals, and Objective Results

Objective: Performance indicators are established, maintained, and trended to provide visibility of organizational goals and objectives. Information is used to observe developing trends and formation of corrective action and recovery plans.

Discussion: The Manager PFP & 222-S Laboratory Maintenance shall utilize performance indicators, goals, and objectives to establish trends and provide feedback to the maintenance organization as presented in WHC-IP-0889. These trends will provide the maintenance organization with a means for assessing maintenance tasking and performance and will allow for corrective action recommendations.

Improvement: Assessment of performance indicators will be made periodically to ensure compliance. At present the existing program is adequate to meet the requirements of the DOE Order. There is no improvement required at this time.

4.15.3 Feedback

Objective: Feedback systems are in place to provide means for continuous communications between all groups, worker disciplines, and management levels. Methods are in place to apply lessons learned from experiences of others, and in-house, to ensure long-term success. All levels of management are available to discuss problem areas and suggested improvements.

Discussion: Programs are in place for employees to address maintenance concerns to management. These programs are the Great Ideas Program, the Clean Sweep Program, and other employee programs. Employees may also use the chain of command and/or an appeals board to voice any concerns. The Manager PFP & 222-S Laboratory Maintenance shall establish an open door policy enabling maintenance personnel to have direct access to management when concerns are present.

Improvement: Assessment of programs and policies regarding identification of concerns will be made periodically to ensure compliance. At present the existing program is adequate to meet the requirements of the DOE Order. There is no improvement required at this time.

4.15.4 Program Reviews

Objective: Managers periodically review and assess all elements of the maintenance program to identify areas requiring improvement or corrective action. Input of managers and supervisors, and other supporting organizations, is utilized in program review. Areas requiring improvement are assigned for corrective action and followup.

Discussion: At WSCF the Manager PFP & 222-S Laboratory Maintenance shall establish a program of reviews and self assessments on an as needed basis and per the requirements of WHC-IP-0889. The feedback from self assessments and reviews will determine changes to the maintenance policy of the maintenance organization at 222-S and WSCF. After one year of WSCF operation, a Self-Assessment shall be conducted by the 222-S maintenance organization which shall assess maintenance activities at WSCF.

***Discussion:* Assessment of Facility Condition and Worker Practices During Maintenance**

Periodic assessments of specific programs such as the PM program are performed per site procedure. WSCF specific program evaluation shall be provided for by the Manager PFP & 222-S Laboratory Maintenance as the need for such an evaluation becomes apparent through audits and assessments.

The 222-S Maintenance Manager shall periodically review personnel performance and work practices. This review shall be directed at improving worker performance. Appraisals shall be performed in accordance with the requirements of WHC-IP-0889.

Equipment and component maintenance history is trended through the application of the JCS program. The Cog engineer shall review this history for maintenance trends or problems.

***Discussion:* Assessment of Maintenance Training**

The maintenance organization shall periodically review the maintenance training program (WHC-IP-0889) specifically as to WSCF impact. Results of this review shall dictate the need, or lack thereof, for training program enhancements and changes.

***Discussion:* Assessment of Procurement Activities**

Periodic assessment of the procurement process are performed by the facility operations and maintenance management for timeliness and responsiveness.

***Discussion:* Assessment of Measuring and Test Equipment**

Facility and Maintenance management assess the M&TE organization for availability of M&TE, and safe and reliable operational support to WSCF.

Improvement: A formalized assessment program has been implemented for 222-S/WSCF maintenance programs. Periodically a review is to be performed to ensure that this program still meets and complies with the requirements of the DOE Order. At present the existing program is adequate to meet the requirements of the DOE Order. There is no improvement required at this time.

4.16 Maintenance History

A maintenance history and trending program should be maintained to document data, provide historical information for maintenance planning, and support maintenance and performance trending of facility systems and components.

4.16.1 Program Development

Objective: A program is in place identifying critical (from the SAR) systems and equipment requiring documentation and retention of historical data.

Discussion: **Equipment Identification**

The Master Equipment List shall provide the identification for major or critical pieces of equipment. Maintenance history, where required, shall be provided through the Maintenance History Module of the JCS.

Discussion: **Data Identification**

Completed work packages under the JCS program, shall include all relevant maintenance data for a given critical piece of equipment. Specific data requirements for a given piece of WSCF equipment that has not been previously identified, shall be provided to the 222-S maintenance organization by the cog engineer.

Improvement: As equipment is received or as equipment is identified for inclusion into the maintenance program, the cog engineer has the responsibility to review the equipment for safety requirements, approval level, and history requirements. This program is already in place and no further improvements is foreseen at this time. Periodic review by the maintenance organization and cog engineer should be performed to ensure that retention of history files are adequate, and that compliance is still maintained.

4.16.2 Data Collection

Objective: Information for systems and equipment identified for record history retention is forwarded to a specified organization for control, reviewed for completeness and correctness, and entered into the equipment history program.

Discussion: Data on WSCF systems and equipment that have been selected for history retention shall be controlled through Recall Systems Maintenance Engineering (RSME) and the Component Based Recall System (CBRS), Job Control System (JCS), or by data input directly to the cog engineer for analysis and trending.

Improvement: Periodic review of this program shall be performed to ensure that the program is in compliance with the DOE Order. No improvements are identified or required at this time.

4.16.3 Program Use

Objective: Equipment history data is readily available to all organizations and is used in the development of work packages and schedules, and is periodically reviewed for developing trends.

Discussion: The JCS program establishes a maintenance history program. This program shall be reviewed by 222-S Maintenance Managers, cog engineers, or any personnel involved with WSCF maintenance to identify problems or areas where maintenance activities may not be warranted.

Improvement: Periodic review of this program shall be performed to ensure that the program is in compliance with the DOE Order. No improvements are identified or required at this time.

4.17 Analysis of Maintenance Problems

Systematic analysis should be used to determine and correct root causes of unplanned occurrences related to maintenance.

4.17.1 Information Collection

Objective: In preparation of event analysis, all applicable logs, records, recordings, and personnel interview statements are gathered.

Discussion: WSCF maintenance activities will be mainly confined to environment control systems, analytical instrumentation, and to building utilities. Maintenance and calibration of special lab equipment will be performed and this information shall be tracked and statused.

Improvement: Periodic review by the maintenance organization shall be performed to ensure that necessary data is being retained for equipment history files. The present program satisfies the intent of the DOE order. No improvement is required at this time.

4.17.2 Event Analysis

Objective: In performing an event analysis a detailed sequence of facts and activities is developed and apparent causal factors identified and categorized.

Discussion: Aspects of root-cause-analysis are presently addressed in site procedures. The activities required by event analysis shall be performed in accordance with root-cause-analysis procedures and guidelines at WSCF.

Improvement: The present program satisfies the intent of the DOE order. No improvement is required at this time.

4.17.3 Cause Determination

- Objective:* Actual or probable causes of a problem are evaluated by one or more techniques to establish a final root cause. Appropriate documentation is developed to aid in the analysis, to record analysis performed, and to document corrective action recommendations.
- Discussion:* WSCF personnel performing cause determination shall be trained in Root-Cause-Analysis and perform activities in accordance with existing site procedures.
- Improvement:* Periodic review shall be performed to determine program compliance. If additional training is identified as being needed, training will be provided to personnel to assist senior staff. The present site Root-Cause-Analysis program satisfies the intent of the DOE order. No improvement is required at this time.

4.17.4 Corrective Action

- Objective:* Corrective action plans are developed, initiated, and tracked to completion. Plans address all applicable activities such as repairs, preventive maintenance procedures, and personnel training.
- Discussion:* Once cause determination has been performed, corrective action shall be initiated in accordance with WHC site procedure and tracked by the PFP Mechanical Maintenance/222-S Lab Manager to completion.
- Improvement:* As corrective action is required at WSCF, the PFP Mechanical Maintenance/222-S Lab Manager shall assess the plan and make any necessary changes or enhancements to assure that corrective action is implemented and completed. Existing site procedures and policies are adequate to meet the intent of the DOE Order. No improvement is required at this time.

4.17.5 Corrective Action Follow-up

Objective: Corrective action followup activities include specific post repair testing and continued monitoring of equipment as positive means to ensure corrective actions taken in fact resolve the problem experience.

Discussion: Equipment corrective action shall be followed by some type of post-maintenance testing and tracked by the JCS. Procedural or administrative changes shall be followed by the 222-S Maintenance Manager and the training organization.

Improvement: Existing site procedures and policies are adequate to meet the intent of the DOE Order. No improvement is required at this time.

4.17.6 Generic Follow-up

Objective: Analysis program includes considerations of generic corrective actions needed for equipment of the same make and model.

Discussion: The cog engineer shall be responsible for reviewing follow-up actions for impact to other similar equipment or same type equipment. Any additional action or rework required shall be identified by the cog engineer.

Additional follow-up of root-cause efforts that enhances future analysis shall be performed in accordance with existing WHC site procedure.

Improvement: Existing site procedures and policies are adequate to meet the intent of the DOE Order. Do to the specialization and quantity of equipment types within WSCF, it is expected that a formalized program for followup action need not be developed. Cog engineer follow-up is adequate to meet the intent of the DOE Order. Periodic assessment shall be made to determine if further enhancement to this policy is required. No improvement is required at this time.

4.18 Modification Work

Facility modification work, including temporary modifications, should be accomplished under the same basic administrative controls as those applied to facility maintenance activities so that there is no increases in risk to facility equipment, environment, or personnel because of the modifications work.

4.18.1 Maintenance Program Interface with Modifications

Objective: Modifications are performed in accordance with requirements and limitations of applicable procedures, codes, standards, and specifications.

Discussion: Modifications work performed by 222-S maintenance shall be in conformance with the requirements of WHC-CM-6-1 and applicable maintenance procedures.

Improvement: Existing site procedures and policies are adequate to meet the intent of the DOE Order. Periodic assessment of the program as it applies to WSCF shall be performed for compliance to the DOE Order. No improvement is identified or required at this time.

4.18.2 Temporary Repairs or Temporary Modifications

Objective: Temporary repairs or modifications are reviewed in accordance with the facility modification program prior to implementation. Temporary repairs or modifications are tracked after completion for consideration of permanent corrective action.

Discussion: Temporary repairs and temporary modifications are controlled per the procedural requirements of WHC-CM-6-1 and tracked by the JCS to completion.

Improvement: Existing site procedures and policies are adequate to meet the intent of the DOE Order. Periodic assessment of the program as it applies to WSCF shall be performed for compliance to the DOE Order. No improvement is identified or required at this time.

4.19 Additional Maintenance Management Requirements

A program should be in place to prevent equipment and building damage due to cold weather at any nuclear facility that may be at risk.

4.19.1 Seasonal Facility Preservation Requirements

Objective: Cold weather protection program to ensure continued safe facility operations is defined and implemented using approved procedures. Program includes criteria for preparation (and suspension), periodic surveillances, and program effectiveness evaluations. Lessons learned are evaluated and appropriate program changes made to prevent recurrence.

Discussion: Seasonal freeze protection at WSCF shall be performed in accordance with a specific freeze protection plan for the facility. A winterization and a summerization program shall be developed for WSCF. Design changes to accommodate these programs may be required.

Improvement: Before startup, WSCF shall be assessed for immediate seasonal preservation requirements. A program for extreme weather conditions shall be developed specifically to meet the requirements of WSCF as the need for such protection is identified.

5.0 DEVIATIONS REQUESTED WITH SUPPORTING RATIONALE

No deviations from the policy requirements identified by DOE Order 4330.4A (DOE 1990), Change 4, are requested at this time.

6.0 IMPLEMENTATION SCHEDULE

The following is the schedule of activities that are to be accomplished before re-assessment of WSCF maintenance is performed at the specified two (2) year interval after startup. The activities identified are based upon assessment at the time of the writing of this document. Any changes to this schedule may be made as further activity assessment is performed. Scheduled startup is 4-30-94.

ACTIVITY	94				95			
	1	2	3	4	1	2	3	4
4.2.1 Maintenance Organization Policies <ul style="list-style-type: none"> ● Review maintenance policy to ensure compliance prior to startup 		X						
4.2.2 Maintenance Strategy <ul style="list-style-type: none"> ● Develop a program for long range maintenance goals ● Develop schedule to support long range plans 						X		
4.2.3 Staffing Resources <ul style="list-style-type: none"> ● Review WSCF maintenance staffing requirements 		X						
4.3.1 Responsibilities <ul style="list-style-type: none"> ● Review training requirements for WSCF maintenance personnel to ensure program is adequate 			X					
4.3.2 Maintenance Training Program <ul style="list-style-type: none"> ● Review training records to ensure maintenance personnel have been trained on specialized equipment. 			X					

WHC-SP-1009, Rev. 0

ACTIVITY	94				95			
	1	2	3	4	1	2	3	4

4.3.3 Training Schedules and Support <ul style="list-style-type: none"> ● Schedule additional training for maintenance personnel if required 	X							
4.3.7 Training Program Approval, Effectiveness, and Feedback <ul style="list-style-type: none"> ● Manager PFP & 222-S Laboratory Maintenance reviews training program for improvement. Approves program. 	X							
4.4.1 Facilities <ul style="list-style-type: none"> ● Assess maintenance facility requirements and adequacy of maintenance facilities. 	X							
4.4.2 Tools and Equipment Storage <ul style="list-style-type: none"> ● Designate controlled areas for storage of Tools and Equipment 	X							
4.5.1 Master Equipment List <ul style="list-style-type: none"> ● Review MEL for accuracy and completeness 	X							
4.5.2 Types of Maintenance <ul style="list-style-type: none"> ● Review maintenance program for adequacy prior to startup 	X							

ACTIVITY	94				95			
	1	2	3	4	1	2	3	4

4.5.3 Maintenance Action and Frequency Selection <ul style="list-style-type: none"> ● Calibration Frequencies identified for applicable equipment 	X	
4.5.4 Scheduling <ul style="list-style-type: none"> ● Establish PM program schedule 	X	
4.6.1 Procedure Development and Writing <ul style="list-style-type: none"> ● Develop maintenance procedures 	X	
4.7.2 Work Priority <ul style="list-style-type: none"> ● Develop schedule for outages and maintenance evolutions 		X
4.13.3 Use of Special Tools and Equipment <ul style="list-style-type: none"> ● Procure specialized tools and equipment 	X	
4.14.4 Scope of Inspection <ul style="list-style-type: none"> ● Define inspection routes and inspection schedules 	X	
4.16.1 Program Development <ul style="list-style-type: none"> ● Identify equipment requiring documentation and retention of historical data 	X	

WHC-SP-1009, Rev. 0

ACTIVITY	94				95			
	1	2	3	4	1	2	3	4

4.19.1 Seasonal Facility Preservation Requirements		
● Develop a program for extreme weather conditions	X	

7.0 BIBLIOGRAPHY

- DOE, 1990, Maintenance Management Program, DOE Order 4330.4A, U.S. Department of Energy, Washington, D.C.
- DOE, 1991b, Quality Assurance, DOE Order 5700.6C, U.S. Department of Energy, Washington, D.C.
- DOE, 1991a, Accreditation of performance-Based Training for Category A Reactor and Nuclear Facilities, U.S. Department of Energy, Washington, D.C.
- DOE, 1993, DOE-RL Hanford Site Hoisting and Rigging Manual, DOE-RL-92-36, U.S. Department of Energy, Richland, Wa.

This page intentionally left blank.

DISTRIBUTION

Number of Copies

ONSITE

4	<u>U.S. Department of Energy</u> <u>Richland Field Office</u> B. E. Hill J. R. Hunter J. E. Mecca T. M. Stram	R3-81 R3-81 R3-81 R3-80
1	<u>MACTEC</u> G. A. Gossett	R3-82
13	<u>Westinghouse Hanford Company</u> M. L. Bell R. J. Bliss S. L. Brey L. L. Curfman R. R. Grabbe D. R. Jordan C. A. Meldrom P. R. Scanlan T. E. Stark Central Files Information Release Administration (3)	T6-16 B3-04 T6-12 T3-01 T6-50 T3-01 T5-02 R1-01 T5-02 L8-04 R1-08

END

**DATE
FILMED**

10 / 25 / 93