1 of 1

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NMP-94-01

NUCLEAR MATERIALS MANAGEMENT STORAGE STUDY (U)

by

G. W. Becker, Jr.

Westinghouse Savannah River Company

Savannah River Site

Aiken, South Carolina 29808

DOE Contract No. DE-AC09-89SR18035

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PREDECISIONAL

**UNCLASSIFIED SUMMARY
NUCLEAR MATERIALS MANAGEMENT
STORAGE STUDY (U)**

February 1994

Planning Support Group

**UNCLASSIFIED
DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION**

ADC/Reviewing Official: Randy Collins/Classification Analyst

Date: 2/3/94

Prepared for the U.S. Department of Energy under Contract DE-AC09-89SR18035

Managed by
Westinghouse Savannah River Company
Planning Division

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PREDECISIONAL

**NUCLEAR MATERIALS MANAGEMENT
STORAGE STUDY (U)
UNCLASSIFIED SUMMARY**

George W. Becker, Jr.
Planning Support Group
Westinghouse Savannah River Company

February 1994

APPROVED BY:

A handwritten signature in dark ink, appearing to read "E. N. Moore", is written over a horizontal line.

E. N. Moore, Manager
Nuclear Materials Planning
Strategic Planning & Analysis Department

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1.0 INTRODUCTION/SUMMARY

The Office of Weapons and Materials Planning (DP-27) requested^{1,2} the Planning Support Group (PSG) at the Savannah River Site to help coordinate a Departmental complex-wide nuclear materials storage study. This study will support the development of management strategies and plans until Defense Programs' Complex 21 is operational by DOE organizations that have direct interest/concerns about or responsibilities for nuclear material storage. They include the Materials Planning Division (DP-273) of DP-27, the Office of the Deputy Assistant Secretary for Facilities (DP-60), the Office of Weapons Complex Reconfiguration (DP-40), and other program areas, including Environmental Restoration and Waste Management (EM).

To facilitate data collection, a questionnaire was developed and issued to nuclear materials custodian sites soliciting information on nuclear materials characteristics, storage plans, issues, etc. (see Appendix A). Sites were asked to functionally group materials identified in DOE Order 5660.1A (Management of Nuclear Materials) based on common physical and chemical characteristics and common material management strategies and to relate these groupings to Nuclear Materials Management Safeguards and Security (NMMSS) records. A database was constructed using 843 storage records from 70 responding sites. The database^{3,4,5} and an initial report⁶ summarizing storage issues were issued to participating Field Offices and DP-27 for comment.

This report presents the background for the Storage Study and an initial, unclassified summary of storage issues and concerns identified by the sites. A classified version of this report (NMP-94-02), containing the complete Storage Study database and classified details supporting the initial summary, has been provided to a limited distribution. Both reports have incorporated the responses and comments from the Operations Offices and their contractors.

2.0 BACKGROUND

The DOE manages and uses a wide range of nuclear materials (listed in Table 1) that have (or could have) defense applications or have use outside of the defense complex in medical, research, industrial, and commercial uses. DOE's Office of Weapons and Materials Planning (DP-27) is responsible for the administration of the Department's nuclear materials management program.

-
- 1 Letter, C. G. Halsted to C. C. Mason, *Nuclear Materials Management Study*, September 15, 1992.
 - 2 Letter, C. C. Mason to G. A. Krist, *Nuclear Materials Study*, September 28, 1992.
 - 3 Report, G. W. Becker, Jr. et. al., *Nuclear Materials Management Storage Study: Database Report*, NMP-93-07, Rev. 1, June 14, 1993.
 - 4 Report, G. W. Becker, Jr. et. al., *Nuclear Materials Management Storage Study: Database Report*, NMP-9307, Rev. 1, Addendum 1, July 1993.
 - 5 Report, G. W. Becker, Jr. et. al., *Nuclear Materials Management Storage Study: Special Database Report*, NMP-93-12, August 1993.
 - 6 Report, G. W. Becker, Jr. et. al., *Nuclear Materials Management Storage Study: Draft Analysis*, NMP-93-13, September 1, 1993.

It is unlikely that Defense Programs facilities will continue to produce many of these materials. Thus, it is prudent that reserve inventories of these materials be established and maintained for future defense and/or non-defense needs because of their innate values and other potential applications.

A comprehensive study addressing management options/actions for the storage of existing nuclear material inventories is needed because of:

- DOE's increased emphasis on efficient management and disposition of nuclear materials;
- increased internal and external interests in ascertaining the quantities and characteristics (chemical, isotopic, RCRA, etc.) of existing nuclear material inventories, the availability of existing and proposed storage capacities and capabilities, and the operability and availability of processing/treatment facilities;
- DOE's need to identify future resource requirements;
- regulatory issues with storage, processing/treatment, shipping, and disposition of inactive nuclear materials;
- concerns about excess nuclear materials identified in other Department sponsored studies (e.g. plutonium disposition studies); and
- the need to support nuclear materials de-inventory activities at individual sites and Defense Complex Reconfiguration plans.

Management issues, such as continued storage versus disposal, are arising from recent DOE mission changes that are causing closures of DOE facilities, decreasing programmatic demands for nuclear materials, expected increasing costs of managing nuclear materials, and budget reductions. The availability of safe, secure storage for the nuclear materials, required recovery or stabilization capabilities, potential utility of nuclear materials in their existing forms, and their value to industry all have a bearing on decisions for continued storage versus disposal. For some nuclear materials, existing storage may be inadequate and require upgrading to comply with established requirements. In some cases, materials may require relocation for disposition or storage. Thus, transportation and storage site location become issues. Required facilities for recovery/stabilization may be lacking, shutdown, or in need of upgrade. Identification and analysis of these issues will assist the DOE in evaluating the options, needs for, and priority of management actions. This storage study provides an initial part of the information and analysis that will be needed to address these nuclear materials management issues.

3.0 DISCUSSION

3.1 Questionnaire

A questionnaire was used to survey nuclear material production and processing sites and laboratories across the DOE complex on their nuclear material storage status, plans and issues. A Storage Study Questionnaire design meeting was sponsored by DP-27 and held at DOE Headquarters in Germantown, Maryland on January 27-28, 1993. The meeting objective was to support the Nuclear Materials Management Storage Study by addressing

each site's specific issues/concerns regarding their nuclear material inventories, storage capacity and capability, and processing capability and availability, and to formally document this information into the form of a questionnaire. Meeting attendees, the resultant Storage Study Questionnaire, and DP-27's cover letter to Field/Operations Offices initiating the survey are attached in Appendix A.

Sites were asked to functionally group materials based on common physical and chemical characteristics and common material management strategies and to relate these groupings to Nuclear Materials Management Safeguards and Security (NMMSS) records. In addition to material and storage location descriptions for site specific "functional" material group, the Questionnaire solicited additional information such as

- Are facilities and forms adequate for interim storage (50 years)?
- What are plans for the subject materials?

This required sites to develop additional technical and materials management information not contained in existing nuclear material accounting databases.

3.2 Task Milestones

Key Storage Study milestones are listed in Table 2.

3.3 Storage Study Database

Results from the Storage Study Questionnaire are contained in the classified Storage Study Database document (NMP-94-02). In NMP-94-02, 843 storage records from 70 respondents are sorted by

- Site,
- Material Type, and
- Site's individual record quantity.

3.4 Initial Summary of Storage Issues and Concerns

An initial summary of issues and concerns identified in the Storage Study follows. They were developed by surveying and synthesizing the database records for administrative, capacity, container, D&D, disposition, form, health physics, RCRA, shipping, and inactive material storage issues and concerns. The classified version of this report contains a separate appendix with details supporting the initial summary.

- Changes in Facility Missions. Many nuclear materials were placed in short-term or in-process storage when production processes were operating. New Program drivers, such as decontamination and decommissioning of unneeded facilities or reconfiguration and restructuring of needed facilities, will require that many nuclear materials be relocated for long-term interim storage. Currently, many items exist in inappropriate forms for interim storage or in containers not intended for interim storage. In some cases inactive materials may need to be processed for stabilization and repackaged for continued storage

prior to facility decommissioning. Storage concerns typically involved deinventorying of stored items on externally driven schedules.

- Reduced Multi-Site Integration. Historically many sites have shipped nuclear materials to other DOE sites for processing and storage. Some of these sites and facilities are no longer able to perform these functions.
- Change in Demand. Reduced missions, declining budgets, and increased costs have lowered the need for larger inventories. Many sites are seeking to reduce their inventories, often as a result of decisions to shut down facilities. Some materials with no current or future planned uses have been in storage for up to twenty years. In many cases, funding for materials disposition is not identified in program budgets.
- Impediments to Action. Even if sites have identified sound technical solutions to storage problems, the implementation is drawn out by the need for detailed and external review of plans and facilities. Typically the administrative issues were about required funding, safety/environmental assessments, operational readiness reviews, justification for continued operation, or DOE concurrence to alleviate a particular storage problem.
- Unstable Forms. Some of the inventories are not suitable for interim storage, because of radiological and chemical concerns. In general, these materials may be unstable, generate off-gas, and/or are corrosive and will require stabilization for shipping, continued storage, or disposal. The treatments required to stabilize these forms for storage or disposal are not readily available or defined.
- Health Protection Concerns. In general, these involve interim storage of materials exhibiting high radiation, reactivity, criticality, and high ingestion/inhalation dose potential.
- Regulatory Concerns. Many materials contain both hazardous as well as radioactive components. As a consequence of mission changes, some of these will or have become mixed wastes as defined by RCRA. In general, RCRA issues concern storage of materials containing corrosive (e.g., acid solutions), reactive (e.g., sodium), EP Toxicity (e.g., contain Cd, Cr, and Ni), and ignitable materials (e.g., sodium or potassium). Other materials are exempt from RCRA under the Atomic Energy Act because they are product material. However, based on recent trends RCRA coverage will be broadened to include exempt materials under the speculative accumulation rule (when the material has reached the end of its useful life). This would have major impacts on management of the Department's inactive nuclear material.
- Shipping Impediments. In general, these involve material items requiring treatment, overpacking, and/or repackaging for shipment. Shipping container availability is also a concern and a major impediment to inventory consolidation.

- **Disposition Uncertainties.** There are many items for which disposition plans are uncertain due to the lack of material characterization, treatment/stabilization capability and availability, storage capacity, or the availability of shipping containers and required packaging.
- **Container Concerns.** Typically, container issues include adequacy of design for interim storage or the potential for loss of containment due to pressurization, corrosion, or degradation of the containment seals due to age.
- **Capacity.** Most sites have storage facilities that are either approaching capacity, full, need replacement due to age, will not be available in the future due to expected site and/or facility decontamination and decommission, or have limited overall capacity.
- **Data Set Completeness** Follow-up will be required to clarify questionnaire responses from several sites. Some sites functionally grouped materials at too high a level and their resulting responses to key storage questions were too general. Some sites with significant quantities of nuclear materials did not respond to the survey. Reporting facility names and NMMSS reporting identification symbols (RIS) of the major sites not included in the database are listed below.

RIS	Site
AAA	US DOE Albuquerque Field Office
FBF	Oak Ridge Associated Universities
FCW	Babcock & Wilcox, Naval Nuclear Fuel Division
FTA, CMC	RMI Co, Extrusion Plant
KAS	Nuclear Fuel Services Inc.
KDS	UNC Naval Products
LAG	Sandia National Laboratory, Livermore
NAB	US DOE Nevada Test Site
PAA	US DOE Pittsburgh Naval Reactors Office
PCR	Babcock & Wilcox Naval Nuclear Fuels
PZB	Westinghouse Bettis, Idaho
RFR,RGE,RUK	Foreign, Office of Safeguards & Security
XHK	Allied-General Nuclear Services
YBC	National Institute of Standards & Technology
YVB	Public Service Co of Colorado, Fort St. Vrain
ZZZF, ZZL	Licensee Lease (Domestic, Foreign)

Table 1: DOE Order 5633.5 Material Types (MT)

NUCLEAR MATERIAL	MT	NUCLEAR MATERIAL	MT
Depleted Uranium	11-18 ^a	Plutonium-239 Weapons Grade	51-52 ^c
Low Enriched Uranium	21-31,89 ^a	Plutonium-239 Fuel Grade	53-56 ^c
Medium Enriched Uranium	32-33 ^a	Plutonium-239 Reactor Grade	57 ^c
Highly Enriched Uranium	34-38 ^a	Lithium-6	61-63 ^d
Very Highly Enriched U	39 ^a	Uranium-233	71-74 ^e
Plutonium-242	41-42 ^b	Normal Uranium	81
Americium-241	44	Neptunium	82
Americium-243	45	Plutonium-238	83
Curium	46	Deuterium	86
Berkelium	47	Tritium	87
Californium	48	Thorium	88

a. Uranium enrichment - Nuclear Material MT Ranges

NUCLEAR MATERIAL	MT	Wt % U-235 Range
Depleted U	11 to 18	% U-235 < 0.711
Low Enriched U	21 to 31,89	0.711 < % U-235 < 5.00
Medium Enriched U	32 to 33	5.00 < % U-235 < 20.00
Highly Enriched U	34 to 38	20.00 < % U-235 < 94.00
Very Highly Enriched U	39	94.00 < % U-235

b. Plutonium-242 Content - Nuclear Material MT Ranges

NUCLEAR MATERIAL	MT	Wt % Pu-242 Range
Pu-242	41	20.0 < % Pu-242 < 60.0
Pu-242	42	60.0 < % Pu-242

c. Plutonium- 239 Content - Nuclear Material MT Ranges

NUCLEAR MATERIAL	MT	Wt % Pu-239/241 Range
Pu-239 Weapons Grade	51 to 52	% Pu-240 < 7.0
Pu-239 Fuel Grade	53 to 56	7.0 < % Pu-240 < 19.0
Pu-239 Reactor Grade	57	19.0 < % Pu-240

d. Lithium-6 Content - Nuclear Material MT Ranges

NUCLEAR MATERIAL	MT	Wt % Li-6 Range
Li-6	61	7.56 % Li-6 < 55.0
Li-6	62	55.0 < % Li-6 < 80.0
Li-6	63	80.0 % Li-6

e. Uranium-233 categories-Nuclear Material MT Ranges

NUCLEAR MATERIAL	MT	ppm U-232 Range
U-233	71	U-232 ppm < 5
U-233	72	5 < U-232 ppm < 10
U-233	73	10 < U-232 ppm < 50
U-233	74	50 < U-232 ppm

Table 2: Storage Study Milestones

MILESTONES	Complete
<ul style="list-style-type: none"> • Storage Study Action Plan/Scoping Report NMP-92-07 Provided a report with the scope, work breakdown, and schedule for completing the Nuclear Materials Management Storage Study Report. 	12/8/92
<ul style="list-style-type: none"> • Storage Study Questionnaire Design Meeting Decided, and documented in the form of a Questionnaire, what information is required to provide a planning basis for nuclear materials storage for the next 50 years. 	1/28/93
<ul style="list-style-type: none"> • Transmit Storage Study Questionnaire Package included the final Questionnaire, bases and assumptions, and supplemental instructions agreed upon at the Questionnaire Design Meeting. 	2/1/93
<ul style="list-style-type: none"> • Transmittal to Field Offices Headquarters sent package with Questionnaire, etc. as well as format for transmittal of "electronic" data to the PSG. 	2/10/93
<ul style="list-style-type: none"> • Established Site Contacts Field Offices were surveyed for Site Contacts. Site Contacts were called to establish interfaces and answer questions. 	2/25/93
<ul style="list-style-type: none"> • Questionnaire Responses Sites developed information and transmitted responses (in form of disks, hard copy, or both) to their FO, DP-27, and PSG. 	3/93-5/93
<ul style="list-style-type: none"> • Database Report NMP-93-7, Rev. 1 Predecisional draft and issued through SR FO to HQ. 	6/18/93
<ul style="list-style-type: none"> • Database Report NMP-93-7, Rev. 1, Addendum 1 A supplement with LANL information was issued. 	6/30/93
<ul style="list-style-type: none"> • Special Database Report NMP-93-12 Issued for headquarters use. 	8/93
<ul style="list-style-type: none"> • Database Summary Report NMP-93-13 A condensation of 843 records from 70 sites based on storage concerns/issues, i.e. administrative, capacity, container, D&D, disposition, form, Health Physics, RCRA, shipping, and inactive material issues and concerns. 	9/1/93
<ul style="list-style-type: none"> • Nuclear Materials Storage Study This report compiles previous draft reports and includes comments and additions received from participating Field Offices and DP-27 reviewers. 	1/31/94
<ul style="list-style-type: none"> • Analysis and Follow-up Study Conduct a study that addresses selected areas of concern identified during the initial analysis of the Storage Study Database. 	TBD

4.0 ACRONYMS

D&D	Decontamination and Decommissioning
DOE	Department of Energy
DP	Defense Programs
EP	Extraction Procedure
LANL	Los Alamos National Laboratory
MT	Material Type (from DOE 5633.5)
NMMSS	Nuclear Materials Management and Safeguards System
ppm	Parts Per Million
PSG	Planning Support Group
RCRA	Resource Conservation and Recovery Act
RIS	NNMMSS Reporting Identification Symbols
SR	Savannah River Operations Office
SRS	Savannah River Site

APPENDIX

- DP-27's Letter to Field/Operations Office
- Storage Study Questionnaire
- Questionnaire Design Meeting Attendees

DOE # 1525.8
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EFG (07-90)

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GENNY LILES

0002-007

United States Government

Department of Energy

memorandum

DATE: February 10, 1993

REPLY TO
ATTN OF: DP-273

SUBJECT: Nuclear Materials Management (NMM) Study on the Storage of Nuclear Materials

TO: A. E. Whiteman, Director, Weapons Quality Division, AL
T. A. Gradle, Acting Director, Safeguards and Security Division, CH
R. J. Hansen, Assistant Manager for Site Operations, FERN
O. L. Jones, Director, Safeguards and Security Division, ID
J. M. Penry, Director, Planning and Budget Division, OR
W. C. Rask, Director, Production Division, RF
J. E. Mecca, Director, Operations and Transition Division, RL
D. A. Ash, Director, Safeguards and Security Division, SF
J. D. Bilyeu, Director, Nuc. Materials Mgmt. and Staff Support Office, SR
J. A. Bullian, Director, Safeguards and Security Division, PNR*
T. A. Bisnett, Director, Contracts Division, SNR*
*Thru: B. Demars, Deputy Assistant Secretary for Naval Reactors, NE-60

Along with the Westinghouse Savannah River Company (WSRC) Planning Support Group (PSG), we conducted a meeting on January 27 and 28, 1993, at the Department of Energy (DOE) Headquarters (HQ) regarding the Complexwide NMM Study on the Storage of Nuclear Materials. Representatives from DOE HQ, field offices, and Government-owned contractor-operated facilities were in attendance to discuss the study scope and plan and finalize the strawman questionnaire. As a result of this meeting, a finalized study scope and plan and strawman questionnaire were mutually agreed upon and documented.

The Headquarters-approved NMM storage study questionnaire (Attachment 1) is being provided to you for completion as agreed upon during the HQ meeting. If you have any questions or concerns regarding Attachment 1, please contact G. W. Becker (WSRC PSG) at 803-725-5516 for clarification.

All responses to the questionnaire should be provided to me with a copy to the PSG by March 10, 1993. Responses should be provided on disk in American Standard Code for Information Interchange (ASCII) format. Reporting in a common format allows for the data to be compiled and processed in a timely manner. With the abundance of information to be provided and a scheduled completion date of May 1993, providing the information in ASCII format will be most efficient.

Your cooperation and assistance are solicited for the timely completion of this task. If you have additional questions or need additional

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GENNY LILES

0003-007

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information on this, please contact me (301-903-2402) or have your staff contact J. Olencz (301-903-6018) of my staff.

Charles G. Halsted
Charles G. Halsted
Director, Office of Weapons
and Materials Planning

Attachment

cc:
J. A. Ford, DP-63
R. D. Hahn, DP-64
K. P. Ferlic, DP-65
A. Cygelman, DP-42
G. Werkema, AL
R. N. Nolan, SF
R. J. Spence, OR
G. M. Nichols, SR
W. D. Clark, SR
G. W. Becker, WSRC

NUCLEAR MATERIALS MANAGEMENT: STORAGE STUDY QUESTIONNAIRE

- 1 FIELD OFFICE**
- 2 SITE**
- 3 MAJOR FACILITIES/LOCATION**
- 4 CONTACT**
- 5 ORGANIZATION**
- 6 PHONE**
- 7 FAX**

Question no. 1
Question no. 2
Question no. 3
Question no. 4
Question no. 5
Question no. 6
Question no. 7

Attached is a sample questionnaire form to be used by Field Offices and Sites (FO/Sites) to provide information to the Planning Support Group (PSG). The basis/assumptions for completing this questionnaire are:

A. Each FO/Site shall include all DOE Order 5660.1A reportable material in inventory as of September 30, 1992. Oak Ridge FO/Sites shall include natural and depleted lithium. Spent fuel which is included in Environmental Restoration and Waste Management's EIS is excluded from the survey.

B. The questionnaire will provide a Complex-wide planning basis for nuclear material storage considerations for the next 50 years (interim).

C. Sites should complete items 1-4 for each site MT and specific material group.

D. In items 1-4, each FO/Site should report on materials located/stored at their site, regardless of programmatic responsibility for the material to the extent that information is available.

E. Each FO/Site should use its best judgment to determine logical or functional grouping/consolidation of material types (MT). Site specific material groups must be traceable to NMMSS COEI (Composition of Ending Inventory) quantities. Provide a unique "site-specific material group identification code" for study data handling, reporting and processing.

F. Each FO/Site shall complete item 5, "Storage Capacity," as a single comprehensive narrative describing current and future storage conditions at the site.

G. The FO/Site programmatically responsible for material stored at another site should include discussion of this material under item 5.

H. WSRC-PSG is available for clarification and assistance regarding completion of the questionnaire. Please expedite transmittal of completed questionnaire forms to WSRC-PSG* as they become available.

I. Completed questionnaires are to be provided to DP-273 with a copy sent to the PSG. DP-273 will receive a copy of all correspondence between FO/Sites and WSRC-PSG.

* George W. Becker, Jr.
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(803) 725-2978 (Fax)

NUCLEAR MATERIALS MANAGEMENT: STORAGE STUDY QUESTIONNAIRE
Site Specific Material Group Code no. 8

1. Material Type

Indicate the material type name(s) Question no. 9 and associated NMMSS material type number(s) (MT) no. 10.

2. Site Specific Material Grouping

What are the common name(s) for the items in this site specific material group Question no. 11
Describe your basis for grouping these items, e.g., common physical and chemical form, managed in the same manner, etc.

Question no. 12

3. Material Description

Provide the site Item Description Codes (IDC) or equivalent, descriptive narrative, and the corresponding NMMSS Composition of Ending Inventory code (COEI) that identify items.

Provide information on the chemical composition, isotopics, and physical state of the items in this material grouping.

Question no. 13

Question no. 14

Do any of these materials exhibit any RCRA hazardous characteristics or contain any listed constituents? If so provide information below.

Question no. 15

Provide the total quantity of material Question no. 16 and the quantity of material in a typical storage package Question no. 17

in this site specific material grouping.

If applicable, provide the Materials Control and Accounting Special Nuclear Materials Category 18 and Attractiveness Level 19

NUCLEAR MATERIALS MANAGEMENT: STORAGE STUDY QUESTIONNAIRE
Site Specific Material Group Code no. 8

NMP-94-01

4. Storage Containers

Describe current material packaging.

Question no. 20

Describe any technical issues associated with storing this site specific material group, e.g., container pressurization, significant corrosion accelerators, required stabilization, etc.

Question no. 21

Is the container adequate for interim storage on-site? If not, provide additional information as available.

Question no. 22Can this material be shipped? ☐ As-is ☐ Needs overpacking ☐ Needs repackaging ☐ Other (e.g., requires treatment etc.) Provide additional information as available.**Question no. 24**

NUCLEAR MATERIALS MANAGEMENT: STORAGE STUDY QUESTIONNAIRE

5. Storage Capacity

Based on the sites current inventory, will there be any excess/shortfall in interim storage capacity/utilization? Include discussion of assumptions, program plans, facility plans, and other information (such as technical issues, regulatory and DOE Order requirements, proposed shipments, facility start-ups, etc.). Include discussion of materials which are stored at other sites but are the programmatic responsibility of your site.

Question no. 25

NMP-94-01

Table 1. Nuclear Material Management: Storage Study Contact Matrix

SITE	ORG.	NAME	TELEPHONE	FAX
Albuquerque	Field Office	J. A. Baca	505-845-5391	505-845-4722
		X Lawrence Barela	505-845-6228	
		C. A. Cruz	505-845-4282	505-845-5188
	LANL	Sherry Sanes	505-665-2712	
Chicago	Field Office	C. G. Ahlberg	708-252-2068	708-252-2078
		F. A. Healy	708-252-2827	708-252-2078
		A. J. Traina	708-252-3827	708-252-2078
Fernald	Field Office	Ray Hansen	513-738-9287	513-738-9236
	FEMCO	Shirley Kaushiva	513-738-6239	513-738-9521
		Jim Lewis	513-738-6812	513-738-9507
Headquarters	DP-273	X Ray Cooperstein	301-903-5353	301-903-5821
		X Bill Newton	301-903-2975	301-903-5821
		X Joe Olencz	301-903-6018	301-903-5821
	DP-634	X Dave Bivans	301-903-5909	301-903-6282
	NE-60	X Richard MacClary	703-602-1663	
	DP-27/ETM	X James Behrend	301-903-2765	
	DP-27/MMES	X Trygve Myhre	301-903-2830	301-903-5821
	DP-27/WSRC	X Randy Yourchak	301-903-2753	301-903-5821
Idaho	Field Office	X Audrey D. Anderson	208-526-5903	208-526-5903
		M. M. Brower	208-526-5918	208-526-0270
Nevada	Field Office	Bob Ramsted	702-295-0082	
Oak Ridge	Field Office	X Becky Eddy	615-576-4119	615-576-8010
		X Tom Wynn	615-576-0630	615-576-5401
	MMES	X Gary F. Hagan	615-574-3695	615-574-9044
		X James D. Stout	615-574-2119	615-576-4760
Pittsburgh Naval Reactors	Field Office	E. A. Evosevic	412-476-7248	412-476-7310
Richland	Field Office	Suzanne Clark	509-376-9055	509-376-0695
		X R. L. Leo Guillen	509-376-4762	509-376-0695
		D. W. Templeton	509-376-2966	509-373-1952
	WHHCO	Luis Gonsales	509-373-3541	
		Russ Hulvey	509-376-4407	
		X Bob Salley	509-372-3571	
Rocky Flats	Field Office	S. L. Rudolph	303-966-5788	303-966-5857
		J. D. Steward	303-966-4873	303-966-5857
	EGG	X Scott H. Davies	303-966-7336	
	KMI	X Richard Harris	303-966-3121	
San Francisco	Field Office	D. G. McIntosh	510-423-4717	510-422-6306
Savannah River	Field Office	X William D. Clark	803-725-5566	803-725-8816
		N. Khalil	803-725-5572	803-725-8816
	WSRC PSG	X George W. Becker, Jr.	803-725-5516	803-725-2978
		X Jack L. Jarriel	803-725-5476	803-725-2978
		X Robert E. Meadors	805-725-5431	803-725-2978
	WSRC	X Blaine K. Taylor	803-725-5349	803-725-2978
Schenectady Naval Reactors	Field Office	C. Bowie	518-395-6373	518-395-6390

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