

M-32

TO: G.C. COMFORT
FROM: D.L. HORTON

NRC HEADQUARTERS

AOC-21 TEL: 716 942-4300

DATE: 04/07/97
PAGE: 1

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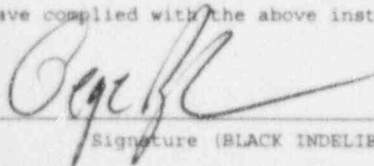
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COMMENTS: ALL PAGES INCLUDED IN ISSUE

CONTROLLED COPY#	PROC ID	REV#	FC#	ISSUE DATE	PROCEDURE TITLE
009	PSR-6	1	1	04/07/97	FISILE MATERIAL PACKAGING AND STORAGE REQUIREMENTS

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Date

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NF08 0/1

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PDR PROJ

M-32

PDR

FOR YOUR CONVENIENCE, A SELF-ADDRESSED, STAMPED ENVELOPE HAS BEEN INCLUDED.



DATE: 04/07/97
TIME: 08:10

PROCESS SAFETY REQUIREMENTS
WVDP-218
INDEX

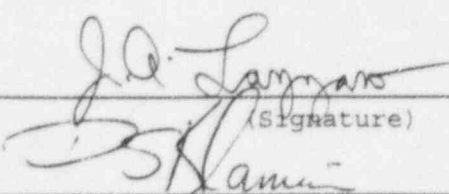
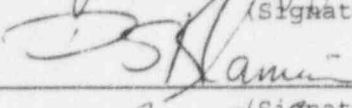
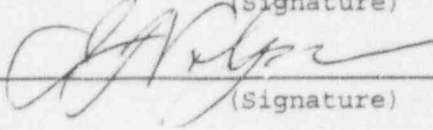
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<u>PROC ID</u>	<u>REV</u>	<u>FC</u>	<u>PROCEDURE TITLE</u>	<u>STATUS</u>	<u>ISSUE DATE</u>	<u>COGNIZANT MANAGER</u>
WVDP-218	7		PREFACE FOR PROCLESS SAFETY REQUIREMENTS	ACTIVE	08/09/96	LAZZARO, J.A.
WVDP-218	7	1	PREFACE FOR PROCESS SAFETY REQUIREMENTS	ACTIVE	11/19/96	LAZZARO, J.A.
WVDP-218	7	2	PREFACE FOR PROCESS SAFETY REQUIREMENTS	ACTIVE	01/30/97	LAZZARO, J.A.
WVDP-218	7	3	PREFACE FOR PROCESS SAFETY REQUIREMENTS	ACTIVE	04/03/97	LAZZARO, J.A.
PSR-1	1		REQUIREMENTS FOR LIQUID TRANSFERS OF FISSILE MATERIAL	ACTIVE	03/15/96	POTTS, W.J.
PSR-1	1	1	REQUIREMENTS FOR LIQUID TRANSFERS OF FISSILE MATERIAL	ACTIVE	04/02/97	POTTS, W.J.
PSR-2	1		MAIN PLANT STACK AIRBORNE EFFLUENT SAMPLING SYTEM REQUIREMENTS	ACTIVE	03/15/96	POTTS, W.J.
PSR-3	1		BUILDING AND VESSEL VENTILATION SYSTEM REQUIREMENTS	ACTIVE	03/15/96	POTTS, W.J.
PSR-5	1		STANDBY AND BACKUP POWER REQUIREMENTS	ACTIVE	03/15/96	POTTS, W.J.
PSR-5	1	1	STANDBY AND BACKUP POWER REQUIREMENTS	ACTIVE	01/24/97	POTTS, W.J.
PSR-6	1		FISSILE MATERIAL PACKAGING AND STORAGE REQUIREMENTS	ACTIVE	07/10/96	KLANIAN, P.S.
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PSR-7	1		EVACUATION ALARM, EMERGENCY PAGING SYSTEM, AND SHELTERING ALARM REQUIREMENTS	ACTIVE	03/15/96	LAZZARO, J.A.
PSR-8	1		FIRE PROTECTION SYSTEMS REQUIREMENTS	ACTIVE	03/15/96	COTTRELL, T.E.
PSR-8	1	1	FIRE PROTECTION SYSTEMS REQUIREMENTS	ACTIVE	01/23/97	COTTRELL, T.E.
PSR-10	2		HIGH-LEVEL WASTE TANK LEAK DETECTION SYSTEM REQUIREMENTS	ACTIVE	05/08/96	MEESS, D.C.
PSR-11	1		HIGH-LEVEL WASTE TANK SPARE CAPACITY REQUIREMENTS	ACTIVE	03/15/96	MEESS, D.C.
PSR-11	1	1	HIGH-LEVEL WASTE TANK SPARE CAPACITY REQUIREMENTS	ACTIVE	03/26/97	MEESS, D.C.
PSR-12	3		VITRIFICATION FACILITY VENTILATION AND OFF-GAS SYSTEMS REQUIREMENTS	ACTIVE	02/21/97	MEESS, D.C.
PSR-13	2		VITRIFICATION FACILITY STANDBY POWER REQUIREMENTS	ACTIVE	03/28/96	MEESS, D.C.
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PSR-15	2		VITRIFICATION FACILITY NON-RADIOLOGICAL SYSTEM MONITORING REQUIREMENTS	ACTIVE	05/16/96	MEESS, D.C.
PSR-16	4		ANHYDROUS AMMONIA REQUIREMENTS	ACTIVE	10/30/96	MEESS, D.C.
PSR-16	4	1	ANHYDROUS AMMONIA REQUIREMENTS	ACTIVE	12/20/96	MEESS, D.C.
PSR-17	1		MINIMUM STAFFING LEVELS FOR SAFE FACILITY OPERATION	ACTIVE	08/05/96	LAZZARO, J.A.
PSR-9	1		TN-BRP AND TN-REG SHIPPING CASK LID INSTALLATION	CANCELLED	03/15/96	LAZZARO, J.A.
PSR-14	1		VITRIFICATION FACILITY CONFINEMENT BARRIER REQUIREMENTS	CANCELLED	03/15/96	LAZZARO, J.A.

WEST VALLEY NUCLEAR SERVICES CO., INC.
RECORD OF FIELD/PAGE CHANGE

Document ID No. PSR-6 Rev. No. 1 FC/PC No. 1
Cognizant Author J. A. Lazzaro Date 03/10/97 Page 1 of 2

Approval Signatures:

<u>J. A. Lazzaro</u>		<u>03/10/97</u>
Cognizant Author (Printed Name)	(Signature)	Date
<u>P. S. Klanian</u>		<u>3/19/97</u>
Cognizant Manager (Printed Name)	(Signature)	Date
<u>J. J. Volpe (R&SC)</u>		<u>3/21/97</u>
(Printed Name)	(Signature)	Date

_____	_____	_____
(Printed Name)	(Signature)	Date
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(Printed Name)	(Signature)	Date
_____	_____	_____
(Printed Name)	(Signature)	Date

1. USQD, WV-3306: ☐ Attached
☒ Not Attached; USQD Safety Exclusion Previously completed and sent to Records Management (per WV-914).
2. Cognizant Manager ☒ if FC/PC Constitutes a Periodic Review: ☐
3. Are other documents impacted by these changes: ☒ No
☐ Yes If Yes, complete WV-2006.

OPERATIONS PROCEDURES (SOPs/SIPs/DVPs) ONLY:

1. ☐ The following changes are Waste Form Acceptance Impacting.
☐ The following changes are Waste Form Acceptance Non-Impacting.
2. Walk-through Required on WV-3802 (Optional): ☐ No ☐ Yes
If Yes, signature indicating walk-through complete:

_____	_____	_____
Operations Manager/Designee (Printed Name)	(Signature)	Date

3. Training Required: ☐ No ☐ Yes

If yes, contact responsible Training Coordinator (if applicable) & initiate WV-1719.
WV:1240.R10
PSR:0004195.01

WEST VALLEY NUCLEAR SERVICES CO., INC.
RECORD OF FIELD/PAGE CHANGE CONTINUATION FORM

Document ID No. PSR-6
FC/PC No. 1

Rev. No. 1
Page 2 of 2

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WVNS RECORD OF REVISION

DOCUMENT

If there are changes to the controlled document, the revision number increases by one. Indicate changes by one of the following:

- Placing a vertical black line in the margin adjacent to sentence or paragraph that was revised.
- Placing the words GENERAL REVISION at the beginning of the text.
- Placing either FC#> or PC#> (whichever applies) in the left-hand margin at the beginning of the paragraph or section where the field/page change has been made AND placing a vertical black line in the margin adjacent to the actual change.

Example:

The vertical line in the margin indicates a change.

FC1>

The FC#> in the margin along with the vertical line (redline) indicates a change.

Rev. No.	Description of Changes	Revision On Page(s)	Dated
0	Document approved - Reference Letter WD:95:0195, J. A. Lazzaro to T. J. Rowland "WVDP Process Safety Requirements (PSRs)," dated 03/03/95. Original document approved, but not issued through controlled distribution.	All	03/03/95
1	Incorporate DOE-WV comments received from review of Rev. 0. General Revision. Document approved - reference letter DW:96:0141 dated 2/18/96	All	07/10/96
PC1	Fix pagination in Table of Contents	1	04/08/97
	In Basis Section, add clarifying paragraph regarding situations that do not require Radiation and Safety Committee approval. Per WVDP-218, Rev. 7, "Introduction," the Basis is not part of the PSR and may be modified as long as the intent of the PSR remains unchanged. Thus, DOE approval is not required.	5	

WVNS RECORD OF REVISION CONTINUATION FORM

<u>Rev. No.</u>	<u>Description of Changes</u>	<u>Revision On Page(s)</u>	<u>Dated</u>
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PROCESS SAFETY REQUIREMENT - 6

TITLE: Fissile Material Packaging and Storage Requirements

CRITERIA: Prevention of criticality during handling and storage of waste
containing fissile materials. (PSR Criterion 3.a.)

UNACCEPTABLE EVENTS: Accumulation of potentially critical concentrations of
fissile materials contained in waste packages.

Process Safety Requirement - 6

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PROCESS SAFETY REQUIREMENT
FISSILE MATERIAL PACKAGING AND STORAGE REQUIREMENTS

APPLICABILITY

This Process Safety Requirement (PSR) applies to the packaging and storage of TRU and suspect TRU material.

OBJECTIVE

The objective of this PSR is to assure that radioactive wastes containing fissile material are packaged and stored in a subcritical configuration through geometric and administrative controls.

SPECIFICATIONS

1. LIMITING CONDITION FOR OPERATION

The total mass of fissile material to be packaged in a waste container, to be stored in the Lag Storage Facility, shall not exceed 125 g for a White 55-gallon Drum and 200 g for a White Rectangular Box without prior written approval of the Radiation Protection Manager.

ACTION

If the total mass of fissile material in a waste package stored in the Lag Storage Facility is found to exceed the specified limit, IMMEDIATE notification shall be made to the Waste Management Manager and the Radiation Protection Manager. The Radiation Protection Manager shall IMMEDIATELY evaluate the waste package and provide a written evaluation for the waste package.

SURVEILLANCE REQUIREMENT

TRU and suspect TRU waste packages shall be sampled and/or analyzed per an approved procedure or methodology before storage in the Lag Storage Facility to determine the fissile material content of the waste. The mass determination shall be documented, by the waste generator, before moving the waste container into the Lag Storage Facility.

2. LIMITING CONDITION FOR OPERATION

The total mass of fissile material to be packaged in a waste container, to be stored in the Lag Storage Facility, shall not exceed 200 g for a White 55-gallon Drum and 350 g for a White Rectangular Box.

ACTION

If the total mass of fissile material in a waste package stored in the Lag Storage Facility is found to exceed the specified limit, all operations in the Lag Storage Facility shall be stopped IMMEDIATELY. IMMEDIATE notification shall be made to the Waste Management Manager and the Radiation Protection Manager. Operations shall not be permitted to resume until written permission from the Radiation Protection Manager is obtained.

SURVEILLANCE REQUIREMENT

Same as for SURVEILLANCE REQUIREMENT 1.

3. LIMITING CONDITION FOR OPERATION

The height of an array of containers which potentially contains fissile materials (TRU waste containers) shall be limited to four tiers.

ACTION

If TRU waste containers are found to be stored in an array having a height greater than four tiers, IMMEDIATE notification shall be made to the Waste Management Manager and the Radiation Protection Manager. All operations in the Lag Storage Facility shall be stopped IMMEDIATELY and shall not be permitted to resume until written permission from the Radiation Protection Manager is obtained.

SURVEILLANCE REQUIREMENT

Arrays of TRU waste containers shall be inspected ANNUALLY per an approved procedure.

4. LIMITING CONDITION FOR OPERATION

The total mass of fissile material as Chemical Process Cell (CPC) floor debris in HI-VAC collection containers in the General Purpose Cell shall be less than or equal to 680 grams.

ACTION

If it is determined that the total mass of fissile material as Chemical Process Cell floor debris in HI-VAC collection containers in the General Purpose Cell is greater than 680 grams, IMMEDIATE notification shall be made to the Main Plant Operations Manager and the Radiation Protection Manager.

SURVEILLANCE REQUIREMENT

An inventory of fissile material in CPC floor debris in HI-VAC containers in the GPC shall be maintained per an approved procedure.

BASIS

Fissile material mass limits are required to assure that a criticality cannot occur under routine waste packaging and storage operations and for all credible off-normal and accident scenarios. All packaged fissile material falls under the TRU and suspect TRU waste categories at the WVDP. Effective neutron multiplication factors generated for a large drum array predicted an adequate margin of safety for uranium and plutonium contaminated wastes limited to 200 grams fissile per drum (Reference 2). The margin of safety is significantly reduced for arrays of drums comprising high concentrations of fissile material which occupy less than 20 percent of the drum volume. The margin of safety is also significantly reduced for White 55-gallon Drums with dimensions smaller than inside diameter of 22.5 inches and a height of 33.25 inches, and White Rectangular Boxes with dimensions smaller than a length of 68 inches, a height of 54 inches, and a depth of 34.5 inches. Separate limits for these conditions must be developed on a case-by-case basis and approved by the Radiation and Safety Committee prior to implementation or upon discovery.

Radiation and Safety Committee approval is not required for packages with dimensions larger than 22.5 inches long, 22.5 inches wide, and 33.25 inches high (i.e., larger than a White 55-gallon Drum) and with total fissile mass less than 125 grams that occupies at least 20% of the package volume. Further, Radiation and Safety Committee approval is not required for packages with dimensions larger than 68 inches long, 54 inches high, and 34.5 inches deep (i.e., larger than a White Rectangular Box) and with total fissile mass less than 200 grams that occupies at least 20% of the package volume.

The analyses to determine the criticality safety of arrays of drums and boxes have been performed using the mass limits stated in the limiting conditions for operation and with the corresponding container dimension as given above. The package limits presented were developed in criticality safety analyses identified in References 1, 2, and 3. These evaluations were checked by an independent reviewer and approved by the Radiation and Safety Committee.

The limits of 200 grams fissile material for a TRU waste drum and 350 grams fissile material for a TRU waste box have been shown to be critically safe for an infinite array of containers under normal operating and accident conditions, provided the height of the array is four tiers or less. To provide a greater margin of safety, administrative controls were established that limit the mass of fissile material to 125 grams per drum and 200 grams per box (Reference 3).

Methods for complying with these limits may vary. In some instances the material to be packaged may be sampled and subjected to radiochemical analysis for specific nuclide determination. In other cases, survey data may be correlated to fissile content using scaling factors based on radiochemical data and appropriate and conservative assumptions. The sampling/analysis procedure or methodology proposed for demonstrating compliance with this PSR requires approval by the Radiation Protection Department.

ATTACHMENT

None.

REFERENCES

- 1) Criticality Safety Analysis Report - Packaging and Storage of WVNS TRU Waste Containers, FB:84:0249, December 1984.
- 2) Criticality Parameters of 55-Gallon Waste Drum Arrays, RHO-SA-183, W.A. Blyckert and R.D. Carter of Rockwell Hanford Operations. November 7, 1980.
- 3) Radiation and Safety Committee Minutes, Fissile Material Limits for Lag Storage Facility, Letter AB:86:0314. July 25, 1986.
- 4) Criticality Safety Evaluation, Operational Safety Requirements, Hazards Classification for Storage of CPS Debris Canisters in GPC, HB:86:0155, October 23, 1986.