S

0053143

ENGINEERING CHANGE NOTICE

Page 1 of 4

1. ECN 657510

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	TA Tomaszewski / WRAP / T4-52 / 373-6323	[X] Yes [] No USQ WRP-00-066	May ~~10~~ 8, 2000
	6. Project Title/No./Work Order No. W026 / WRAP Facility / NA	7. Bldg./Sys./Fac. No. 2336W/FSAR/WRAP	8. Approval Designator NQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WRAP FSAR: HNF-SD-W026-SAR-002 Rev 1	10. Related ECN No(s). None.	11. Related PO No. None

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? [] Yes [X] No

Replace in their entirety, FSAR Chapters 5.0 and 6.0 with the attached Revisions 1-A.

This ECN 1) removes identification of isolated facilities from the FSAR, 2) revises the fissile gram limit of NDA test drums with sealed source materials, 3) adds TEEL Revision 16, and 4) makes minor editorial changes.

See pages 3 and 4 for the details.

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14a. Justification (mark one)

Criteria Change	[]	Design Improvement	[X]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

FSAR Revision 1 Sections 6.5.4 and 6.6, TSR, HNF-SD-WM-TSR-007, Section 5.3.2, Revision 1, and CSER 96-011 allow the WRAP Process Area to be designated as up to three isolated facilities. There is no requirement that isolated facilities be identified in text of the FSAR. HNF-2594 (CSER 98-002) established a new fissile gram limit for NDA test drums with sealed sources and eliminated test boxes from consideration. Other changes are editorial in nature.

15. Distribution (include name, MSIN, and no. of copies)

See attached distribution sheet.

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A-7900-013-2 (05/96) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 657510

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[X]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[X]
Vendor Information	[]	Operating Procedure	[X]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]	DOE WRAP Safety Evaluation Report (SER).	[]
Environmental Permit	[]	Inventory Adjustment Request	[]	NONE	[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
OP-724, OP-725, OP-503	WMH-350, Section 1.2 WMH-350, Section 3.14 Letter 32610-98-RJB--012, dated June 9, 1998.	DMS software, PCS software, HNF-SD-W026-SDD-030, and HNF-3291

21. Approvals

	Signature	Date		Signature	Date
Design Authority			Design Agent		
Cog. Eng. TA Tomaszewski	TA Tomaszewski	5-5-2000	PE		
Cog. Mgr. JR Weidert		5-5-00	QA		
QA WR Thackaberry	D.L. VANCE FOR:	5/8/00	Safety		
Safety JC Givens		5-5-00	Design		
Environ. Compliance Officer HC Boynton		5-5-00	Environ.		
Nuclear Safety RM Nelson		5-8-00	Other		
Fire Safety					
Nuclear Engineering RR Ames		5-8-00			
WRAP Facility Manager RR Bloom		5/8/00	DEPARTMENT OF ENERGY		
Rad Con Manager, DN Stewart		5-5-00	Signature or a Control Number that tracks the Approval Signature		
Crit Safety Rep, MF Hackworth		5-5-00			
Operations Engineer, WA Robertson		5-5-00	ADDITIONAL		

13a Continued. Description of Changes

CHAPTER 5:

1. Section 5.3.6, last paragraph:

WAS: Areas of WRAP other than the process enclosures (e.g., shipping/ receiving, NDE/NDA) are operated as a limited control facility (WRP1-CPS-001 and WRP1-CPS-002).

IS: Areas of WRAP other than the process area (e.g., shipping/ receiving, NDE/NDA) are operated as a limited control facility (WRP1-CPS-001 and WRP1-CPS-002).

2. Section 5.5.5, second bullet: The period in the first line was replaced with a comma.

3. Section 5.5.5, BASIS:

WAS: The current maximum limit for containers which contain source materials (both sealed and unsealed) is 450 g of fissile material per container.

IS: The current maximum limit for NDA test drums which contain source materials (sealed) is 350 FGE per drum.

4. Section 5.5.6.2: The section title was changed from "Fissile Limits for Process Enclosures" to "Fissile Limits for Isolated Facilities".

5. Section 5.5.6.5, paragraph:

WAS: Updates to the ERPGs/TEELs (such as from WSMS-SAE-98-001, ERPGs and Recommended TEELs, Revision 13, December 1997, Westinghouse Safety Management Solutions, Inc., D. K. Craig) and to the implementing procedure and database shall be documented and made on an annual basis as a minimum.

IS: Updates to the ERPGs/TEELs (such as from *WSMS-SAE-00-0052, SWEATEEL Update February 2000*, Westinghouse Safety Management Solutions, LLC, D. K. Craig) and to the implementing procedure and database shall be documented and made on an annual basis as a minimum.

6. Section 5.5.6.5, Basis:

WAS: A 177 gram limit of plutonium-239 FGE in the process enclosures is required by the Isolated Facility Nuclear Safety Classification. Nonradiological hazardous exposures were evaluated using MARs that ensure toxic material accident consequences do not exceed ERPG-3 values for facility workers, ERPG-2 values for colocated workers, and ERPG-1 values for the public.

IS: A 177 gram limit of plutonium-239 FGE in designated isolated facilities is required by the Isolated Facility Nuclear Safety Classification. Nonradiological hazardous exposures were evaluated using MARs that ensure toxic material accident consequences do not exceed allowable concentration values (such as ERPG, TEEL, and/or other approved concentrations) for facility workers, colocated workers, and the public.

7. Section 5.6, Waste Drum Processing Area, first bullet: The word "ends" was added. "The process enclosures (bottom, sides, ends, top, and viewing windows) are all designated as safety-significant SSC."

CHAPTER 6:

1. Section 6.3 next to last paragraph:

WAS: Even so, the TRU process enclosure has been designated as an isolated facility, thus limiting the total amount of TRU material that can be accumulated there.

IS: Even so, the process area has been designated as up to three isolated facilities, thus limiting the total amount of TRU material that can be accumulated there.

2. Section 6.4.1 last paragraph:

WAS: Material is accounted for before introduction into the WRAP isolated facilities, during processing, and after removal from the WRAP isolated facilities.

IS: Material is accounted for before introduction into an isolated facility, during processing, and after removal from an isolated facility.

3. Section 6.4.2 second paragraph:

WAS: Labeling and documentation track the level of fissionable material in containers and process enclosure.

IS: Labeling and documentation track the level of fissionable material in containers. Validated spreadsheets and the plant computer systems track the amount of fissionable material in the isolated facilities.

4. Section 6.4.3 last paragraph:

WAS: Double contingency is maintained in the WRAP Process Area, by defining the TRU glovebox line as one isolated facility, defining the balance of the Process Area as a second isolated facility, and limiting the total allowable fissionable material in each of the WRAP isolated facilities to one-third the minimum critical mass or less. More than two concurrent violations are required before a criticality can occur. In fact, after three contingencies the system would still be subcritical.

IS: Double contingency is maintained in the WRAP Process Area with fissionable mass limits on waste containers, by defining the Process Area as up to three isolated facilities, and limiting the total allowable fissionable material in each isolated facility to one-third the minimum critical mass or less. More than two concurrent violations are required before a criticality can occur.

S

HNF-SD-W026-SAR-002
Revision 1-A

WASTE RECEIVING AND PROCESSING FACILITY FINAL SAFETY ANALYSIS REPORT

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200
Fluor Hanford
P.O. Box 1000
Richland, Washington

Approved for public release; further dissemination unlimited

HNF-SD-W026-SAR-002
Revision 1-A
ECN 657510

WASTE RECEIVING AND PROCESSING FACILITY FINAL SAFETY ANALYSIS REPORT

T. A. Tomaszewski
Fluor Hanford

Date Published
May 2000

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

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Fluor Hanford
P.O. Box 1000
Richland, Washington

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RECORD OF REVISION	(1) Document Number HNF-SD-W026-SAR-002	Page 2 of 2

(2) Title
Waste Receiving and Processing Facility Final Safety Analysis Report

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
1	All Pages. Annual Update Per ECN-655107.	TA Tomaszewski	JR Weidert
RS 1-A	Replace Chapters 5.0 and 6.0 per ECN 657510.	TA Tomaszewski 5/8/00	JR Weidert 5-8-00

CONTENTS

5.0 DERIVATION OF TECHNICAL SAFETY REQUIREMENTS 5-1

5.1 INTRODUCTION 5-1

5.2 REQUIREMENTS 5-1

5.3 TECHNICAL SAFETY REQUIREMENT COVERAGE 5-2
5.3.1 Safety Limits 5-2
5.3.2 Limiting Control Settings 5-2
5.3.3 Limiting Conditions for Operation 5-3
5.3.4 Surveillance Requirements 5-3
5.3.5 Administrative Controls 5-3
5.3.6 Defense in Depth 5-3
5.3.7 Significant Worker Safety 5-4
5.3.8 Maintaining Consequences Below Evaluation Guidelines 5-5

5.4 DERIVATION OF FACILITY MODES 5-5

5.5 TECHNICAL SAFETY REQUIREMENT DERIVATION 5-6
5.5.1 Technical Safety Requirement Violations 5-6
5.5.2 Staffing and Position Requirements 5-6
5.5.3 Contractor Responsibility 5-7
5.5.4 Organization and Management 5-7
5.5.5 Nuclear Criticality Safety 5-8
5.5.6 Inventory Control 5-8
5.5.7 Combustible Loads 5-10

5.6 DESIGN FEATURES 5-10

5.7 INTERFACE WITH TECHNICAL SAFETY REQUIREMENTS FROM OTHER FACILITIES 5-11

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5.0 DERIVATION OF TECHNICAL SAFETY REQUIREMENTS

The purpose of this chapter is to identify parameters from the safety analysis that are controlled by *Waste Receiving and Processing Facility Technical Safety Requirements* (HNF-SD-WM-TSR-007) and to provide the basis for establishment of the TSRs. This chapter identifies the basis for TSR administrative controls (ACs) for specific control features and programs necessary to perform institutional safety functions. This chapter further discusses WRAP passive design features and staffing requirements. There are no TSRs from other facilities that directly affect WRAP personnel.

5.1 INTRODUCTION

TSRs define acceptable conditions, safe boundaries, and management or ACs required to ensure safe operation of a nuclear facility and reduce the potential risk to the public and workers from uncontrolled releases of radioactive materials or from radiation exposure because of inadvertent criticality (DOE Orders 5480.22 and 5480.23). The evaluations in Chapter 3.0 were used to derive TSR requirements for WRAP. TSR information is based on material in Chapters 3.0 and 4.0.

The following are terms used in the safety analysis:

- Fissile gram equivalent (FGE)--Referenced to plutonium-239 and shall be calculated using the methods detailed in HNF-EP-0063.

- Fissile material--Material made up of nuclides that will sustain a chain reaction by thermal (slow) neutron induced fission. For the WMH criticality safety program uranium-233, uranium-235, plutonium-239, and plutonium-241 are the primary nuclides of interest

- Fissionable materials--Substances containing nuclides capable of sustaining a nuclear fission chain reaction (regardless of the neutron energy). Such material may be fissionable only by nature of its form, configuration or environment. For the WMH criticality safety program this includes uranium-233, uranium-235, plutonium-238, plutonium-239, plutonium-241, neptunium-237, americium-241, and curium-244

- TRU waste--DOE Order 5820.2A, *Radioactive Waste Management*, defines TRU waste without regard to source or form, as waste that is contaminated with alpha-emitting transuranium radionuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries per gram at the time of assay. Transuranium radionuclide is any radionuclide having an atomic number greater than 92.

- Drums and boxes--Unless otherwise specified, all references to drums and boxes are assumed to apply to drums and boxes containing wastes. Drums and boxes containing calibration sources will be specifically noted.

5.2 REQUIREMENTS

Requirements for this chapter are identified in DOE Order 5480.23 and its format and content follow the guidelines provided in DOE-STD-3009-94. A graded approach is applied consistent with requirements of DOE Order 5480.23 and the guidance in DOE-STD-3009-94 such that the level of analysis and documentation is

commensurate with the magnitude of the hazards, the complexity of the process, and the stage of the facility life cycle.

Facility specific requirements are contained in the *Waste Management Operations Standards and Requirements Identification Document* (S/RID) (HNF-SD-MP-SRID-011).

5.3 TECHNICAL SAFETY REQUIREMENT COVERAGE

The purpose of this section is to ensure that TSR coverage for WRAP is complete. A separate TSR document based on this chapter is required as defined in DOE Order 5480.22. On approval of the FSAR, HNF-SD-WM-TSR-007 was issued.

The hazard and accident analysis for WRAP, presented in final form in Chapter 3.0, evaluated the criteria for SLs, LCSs, LCOs, surveillance requirements (SRs), and ACs. Additionally, determination of the completeness of TSR coverage requires a review of features identified in Chapters 3.0 and 4.0 that are needed to:

- Provide significant defense in depth. These features are safety-significant SSC and their associated assumptions requiring TSR coverage and any other TSR assumptions identified in Chapter 3.0 according to the screening criteria of DOE 5480.22.

- Provide for significant worker safety. These features are safety-significant SSC identified in Chapter 4.0 and their associated assumptions requiring TSR coverage in Chapter 4.0, and any programs identified as needing coverage in TSR ACs in Chapter 3.0. The process enclosures are designated as safety-significant.

- Maintain consequences of facility operations below offsite evaluation guidelines. These features are safety-class SSC and assumptions requiring TSR coverage in Chapter 3.0. Accident analyses are based on an assumed maximum inventory in waste containers.

5.3.1 Safety Limits

SLs define parameters which, if violated, would result in uncontrolled releases of radioactive or hazardous materials. Based on the accident analyses presented and comprehensive administrative controls, there are no postulated accidents that would result in unacceptable unmitigated offsite consequences to a member of the public. Therefore, there are no SLs nor LCSs applicable to WRAP.

5.3.2 Limiting Control Settings

No LCSs are needed for WRAP because no SLs have been identified.

5.3.3 Limiting Conditions for Operation

Based on the interpretation of the safety analyses presented and comprehensive administrative controls, no LCOs for operations nor SRs were identified for WRAP.

5.3.4 Surveillance Requirements

SRs are used to maintain operations within the SLs, LCSs, and LCOs. There are no SLs, LCSs, or LCOs identified for WRAP; therefore, no SRs are needed.

5.3.5 Administrative Controls

This section identifies the coverage of TSR ACs for WRAP. ACs are the provisions relating to organization and management, procedures, record keeping, reviews, and audits necessary to ensure safe operations. According to DOE 5480.22, TSR ACs include the following:

- Handling and reporting of TSR deviations or violations
- Staffing levels and positions required for safe operation of the facility
- Physical and ACs for the criticality safety program
- Other safety programs.

5.3.6 Defense in Depth

The principle of defense in depth has been applied to WRAP design and operation planning through the use of strong, tight, substantial containers; dedicated process lines;, process enclosures; and ventilation zones, airlocks, and curbs. These features, which contribute to defense in depth, are discussed in Chapter 2.0 and Chapter 5.0. Hazardous waste materials are distributed throughout WRAP in drums and boxes, with the largest concentration in the shipping and receiving area. Operating procedures, requirements, and limits specify allowable hazardous material types and quantities, internal packaging, material form, and container characteristics. These controls do not meet the criteria for SLs, LCSs, LCOs, or SRs. ACs will be provided to define requirements for response to AC violations, organization and management, contractor responsibility, staffing requirements, control of building combustibles, and facility and process line inventory control to ensure that WRAP operations remain within the safety basis used in this FSAR.

The analyses of potential consequences from credible bounding accidents at WRAP assumed no mitigation. The results, shown in Chapter 3.0, indicate that no offsite consequences would exceed evaluation guidelines and, with defense in depth measures described in Section 3.3.2.3.2, the probability of credible bounding accidents would be reduced such that the onsite consequences are within the onsite evaluation guidelines. The potential for significant consequences to

facility workers from process enclosure failures indicate that these enclosures should be designated as safety-significant for worker safety. During routine operations, no waste drums are opened outside of the process enclosures. If the need arises to open a process waste container outside of the enclosure lines, additional administrative controls and/or temporary confinement enclosures will be utilized to maintain confinement and worker protection.

Only the process enclosures would have any potential to accumulate the quantity of fissionable material needed to cause an inadvertent criticality. Even with an increase in the quantity of material, a criticality event is not possible without rearrangement, concentration, moderation, and optimum geometry, because of the form and distribution of the waste. Regardless, an AC is provided to ensure that the total amount of fissile material in any process enclosure at any one time is within the definition of an isolated facility. Currently, the mass limit for isolated facilities is one-third of the minimum critical mass (one-third being 177 grams of plutonium-239). As a result, more than two separate but concurrent violations of the AC would be required to accumulate sufficient material for an inadvertent criticality, and only then under optimum conditions of concentration, geometry, and moderation. Therefore, no defense in depth-driven SLs, LCSs, LCOs, or SRs are needed.

Hazardous/mixed waste accumulation containers and room waste containers for wastes generated at WRAP will be opened as needed to support facility operations. The opening and management of the hazardous/mixed waste accumulation containers and the room waste containers will be in accordance with site policies and procedures.

Areas of WRAP other than the process area (e.g., shipping/ receiving, NDE/NDA) are operated as a limited control facility (WRP1-CPS-001 and WRP1-CPS-002).

5.3.7 Significant Worker Safety

According to DOE Order 5480.22, "DOE's first safety responsibility must be the protection of the public. Those who work at DOE facilities accept some risk of exposure to radioactive and other hazardous materials due to the nature of the materials with which the facilities operate. Nevertheless, it is incumbent upon DOE to assure that its facilities are operated in a manner that minimizes the risk to workers and limits exposures to hazardous materials to levels permitted by Federal or State regulations and relevant DOE Orders. The TSRs, by requiring the facilities to operate within predetermined safety limits, not only protect the public health and safety and that of nearby workers but also inherently reduce the risk to workers and facilities. The TSRs are not based upon maintaining worker exposures below some acceptable level following an uncontrolled release of hazardous material or inadvertent criticality; rather the risk to workers is reduced through the reduction of the likelihood and potential impact of such events. This is accomplished by the development of safety requirements in the TSR for those systems, components, and equipment that: (a) are barriers preventing the uncontrolled release of radioactive and other hazardous materials; (b) mitigate such releases; and (c) prevent inadvertent criticality." Because of the protection to personnel provided by the process enclosures in case of an explosion, the process enclosures are designated as safety-significant SSC as discussed in Chapter 3.0, Section 3.3.2.3.3; however, since the process enclosures are passive barriers and will be listed as design features, there are no associated TSRs.

DOE Order 5480.22 also states "It should be noted that the impact from the release of hazardous materials is also reduced through industrial hygiene and radiation protection oversight (e.g., monitoring of worker exposures, use of personal protective clothing and equipment (PPE) and emergency evacuation planning), as well as the use of TSRs." and "Because of the necessary and inherent presence of hazardous and radioactive materials at DOE nuclear facilities and the workers' proximity to these materials, it is impractical to reduce worker risk to an insignificant level through selection of operating limits in TSRs. The protection of the health and safety of workers is assured by the combination of: (a) the development of TSRs for barriers to uncontrolled releases and for preventative and mitigative systems, components, and equipment; (b) use of PPE; (c) emergency protection programs; (d) worker education; and (e) drills." As discussed previously, the process enclosures are passive barriers designed to prevent uncontrolled releases with no associated TSRs. Further mitigation of uncontrolled releases is administratively addressed by TSRs limiting facility inventory and combustible loads. Use of PPEs, emergency protection programs, worker education, and drills are addressed in Chapters 7.0, 12.0, and 15.0.

5.3.8 Maintaining Consequences Below Evaluation Guidelines

As stated previously, the Chapter 3.0 analysis of potential consequences from bounding credible accidents at WRAP, assuming no mitigation, indicates that no offsite consequences would exceed evaluation guidelines and, with defense in depth measures described in Section 3.3.2.3.2, the probability of credible bounding accidents would be reduced such that the onsite consequences are within the onsite evaluation guidelines. Therefore, with an AC on the isotopic inventory of containers, no consequence-derived SLs, LCSs, LCOs, or SRs are needed.

5.4 DERIVATION OF FACILITY MODES

The following facility modes are applicable to WRAP:

OPERATION	The mission of the facility or its current campaign is being performed.
SHUTDOWN	The facility is not performing its mission or its current campaign, and is incapable of doing so in its present condition.
WARM STANDBY	The facility is not operating but still retains its inventory of hazardous material.
COLD STANDBY	The facility is not operating with its hazardous material inventory removed.
REPAIR	The facility is not able to perform its mission in its current condition.
RESTRICTED	Restricted area(s) or activity is defined. Receipt of additional waste containers in the area(s) affected by the restriction is not allowed. Processing of waste containers

is not allowed in the area(s) affected by the restriction unless specifically authorized by an approved recovery plan. Routine inspections and maintenance could occur.

A program for documentation of mode status for WRAP is established, implemented, and maintained to ensure the facility status is documented and remains current. TSRs, including ACs, are applicable unless otherwise noted during all modes. Additionally, ACs not covered as TSRs are compiled in a compliance matrix and tracked to ensure proper implementation.

5.5 TECHNICAL SAFETY REQUIREMENT DERIVATION

The derivation of WRAP TSRs is based on the accident analyses described in Chapter 3.0, the SSC evaluations described in Chapter 4.0, DOE Order 5480.22 requirements, and the operations contractor's policy for TSRs.

The evaluations used to derive the WRAP TSRs demonstrate that safe operation is feasible and safety issues involving design considerations and operations have been anticipated and their effects minimized. The analyses in Chapter 3.0 indicate that safety-class SSC are not required.

Each AC to be established in the TSR document is addressed in the following sections, along with its basis.

5.5.1 Technical Safety Requirement Violations

The TSR document includes an AC that specifies the following actions to be taken if a violation of a WRAP TSR occurs:

- Place the facility or affected area (or activity) in the Restricted Mode and notify DOE-RL of the violation according to the DOE occurrence reporting requirements.
- Prepare an Occurrence Report in accordance with the Waste Management Operations S/RID occurrence reporting requirements.
- Prepare and implement a recovery plan describing the steps leading to compliance with the AC.
- Perform and document a technical evaluation, if appropriate, of the AC violation to determine if any damage has occurred.
- Perform and document a root cause analysis and implement a corrective action plan, if appropriate, to minimize the chance of recurrence.

BASIS: Event notifications for violations of technical safety requirements are addressed in Chapter 17.0. An event investigation is required when design limits, including TSRs, are violated.

5.5.2 Staffing and Position Requirements

The TSR document includes an AC that specifies the staffing levels and position requirements needed for safe operations of WRAP. This AC identifies the

minimum operations shift complement for each facility mode. The TSR provides this information in tabular form.

BASIS: Staffing (including minimum shift complement and restrictions on extended work hours), training, and qualifications are addressed in Chapter 2.0, Section 2.10; Chapter 12.0, Section 12.4; and Chapter 17.0, Section 17.3.3.

5.5.3 Contractor Responsibility

The TSR document contains an AC that addresses the following responsibilities of the WRAP operations contractor.

The operations contractor is responsible to DOE for safe operation of WRAP in accordance with the TSRs as approved by the DOE Program Secretarial Officer (PSO), or designee, including any modifications made by the PSO.

The operations contractor is responsible for operating WRAP within the approved safety basis and for maintaining the current DOE-approved FSAR and TSR documents as controlled documents. Programs developed to ensure safe and healthful operation of nuclear facilities on the Hanford Site are implemented at WRAP as discussed in Chapters 6.0 through 17.0.

According to DOE Order 5480.22, the contractor can take emergency actions that depart from the approved TSRs when no actions consistent with the TSR are immediately apparent, and when these actions are needed to protect the public health and safety. Such contractor actions will be approved, as a minimum, by a lead operator or supervisor. If emergency actions are taken that are not covered by existing emergency procedures, verbal notifications will be made according to DOE occurrence reporting requirements.

BASIS: Operation within the approved TSRs ensures that the conclusions of the FSAR remain applicable and that the facility remains within the analyzed safety envelope. According to DOE Order 5480.22, the TSR document and its appendices constitute an agreement or contract between DOE and the facility operating management regarding the safe operation of the facility. As such, these cannot be changed without PSO or designee approval. Chapter 12.0 addresses procedures and training. Chapter 15.0 addresses emergency preparedness.

5.5.4 Organization and Management

An AC is provided in the TSR document that requires lines of authority, responsibility, and communication to be established, defined, and maintained for all WRAP management levels, up to the highest responsible authority. The AC requires these relationships to be documented and updated, as appropriate, in the form of organization charts and/or functional descriptions and issued whenever the charts or functions change or annually, whichever occurs first. Discussion of organizational structure and organization charts are provided in Chapter 17.

This AC specifies that the WRAP Plant Manager is accountable and responsible for the safe operation of WRAP. Safe operation responsibilities include, as necessary, interface requirements with other onsite organizations and facilities.

The AC also requires the contractor to provide for independent safety audits and quality assurance functions to ensure safe operation.

BASIS: The operations contractor's policy is to manage facilities and operations in a manner consistent with an auditable set of procedures, requirements, standards, and responsibilities. Safe operation requires clear definitions of accountability authority, responsibility, and communication, as described in Chapter 17.0.

5.5.5 Nuclear Criticality Safety

The TSR document contains an AC that requires a program be established, implemented, and maintained so that an accidental criticality at WRAP remains an incredible event. Elements of this program are as follows.

- The nuclear criticality safety program maintains a fissile materials inventory compliant with the classifications as a Limited Control Facility for the Shipping/Receiving and NDE/NDA(WHC-SD-SQA-CSA-516 and HNF-2594) areas and up to three Isolated Facilities for the Process Area (WHC-SD-SQA-CSA-510). The current criticality prevention specification (CPS) covering the operations in the Shipping/receiving and NDE/NDA areas of WRAP are WRP1-CPS-001 and WRP1-CPS-002. Assurance against a criticality nonconformance in the process enclosures shall be based on the criticality safety analysis documented in WHC-SD-SQA-CSA-510. Assurance against a criticality incident during source repacking in the Shipping/Receiving Areas shall be based on the criticality safety analysis documented in HNF-2594.

- In the event the CPS (WRP1-CPS-001 or WRP1-CPS-002), CSA (WHC-SD-SQA-CSA-510) or Criticality Safety Evaluation Report (HNF-2594) requirements are not met, notification will be immediate and will include the WRAP manager and the manager of Criticality and Radiological Analysis. The cause of the deficiency will be determined and a course of action to correct the problem will be implemented. (All requirements apply for actions to be taken if a TSR violation occurs.)

- The information and reports for determining fissile amounts of containers/material, together with container placement records, will be retained demonstrating that the CPS requirements are being maintained.

BASIS: Chapter 6.0 addresses prevention of inadvertent criticality. The current limit in an isolated facility is 177 FGE. The current limit for waste containers in the limited control areas of the facility is 200 g of fissile material per drum and 325 g of fissile material per SWB or Type A metal boxes. The current maximum limit for NDA test drums which contain source materials (sealed) is 350 FGE per drum.

5.5.6 Inventory Control

The TSR document includes an AC specifying the program to be established, implemented, and maintained so that WRAP will operate within the approved safety basis and the inventories assumed in the safety analysis (and documented in Chapter 3.0) will not be exceeded. This AC requires the operability and routine testing of NDA equipment as part of the inventory control program. The following

summarizes the radioactive concentration and packaging limit that ensures the preclusion of unacceptable exposure to any offsite individual:

- Maximum single drum limit of 35.0 DE-Ci; maximum wooden box limit of 35.0 DE-Ci; maximum drum limit for process enclosures of 177 FGE; and maximum standard waste box, and Type A metal boxes, limit of 56.9 DE-Ci ensures that the consequences of the most limiting accident will result in doses less than the risk comparison guidelines.

- The bounding facility inventory of 1,433 DE-Ci shall not be exceeded.

5.5.6.1 Drum Limits. A 35.0 DE-Ci per-drum limit will not be exceeded for drums entering WRAP. If radiological content of drummed waste is discovered to be higher than the 35.0 DE-Ci per-drum limit, appropriate recovery actions will be implemented to maintain the established limit. To maintain FSAR compliance, the initial recovery action will be completed within 4 hours. If the initial recovery action is to remove the drum from the facility or place the drum into a Type B overpack, an analysis must be completed before the container can be returned to WRAP or removed from the Type B container.

5.5.6.2 Fissile Limits For Isolated Facilities. A plutonium-239 FGE limit of 177 grams will not be exceeded for fissile material accumulated in a WRAP Isolated Facility. If the plutonium-239 FGE limit of 177 grams for fissile material accumulated in a WRAP Isolated Facility is exceeded, a violation of the requirements of Section 5.5.5 has occurred and the actions required by Section 5.5.1 must be performed.

5.5.6.3 Wooden Box Limits. A 35.0 DE-Ci limit will not be exceeded for wooden boxes entering WRAP. If radiological contents of wooden boxes are discovered to be higher than the 35.0 DE-Ci limit, appropriate recovery actions will be implemented to maintain the established limit. To maintain FSAR compliance, the initial recovery action will be completed within 4 hours. If the recovery action is to remove the box from the facility, an analysis must be completed before the box can be returned to WRAP.

5.5.6.4 Metal Waste Box Limits. A limit of 56.9 DE-Ci will not be exceeded for metal boxes in WRAP. If radiological contents of boxed waste are discovered to be higher than the 56.9 DE-Ci limit, appropriate recovery actions will be implemented to maintain the established limit. To maintain FSAR compliance, the initial recovery action will be completed within 4 hours. If the initial recovery action is to remove the box from the facility, an analysis must be completed before the box can be returned to WRAP.

5.5.6.5 Nonradiological Hazardous Inventory Control. Acceptance of nonradiological hazardous waste materials at WRAP will be controlled in accordance with the methodology described in Chapter 3.0, Section 3.4.2.6.3, that ensures accidental exposures to facility workers, collocated workers, and the public will not exceed established guidelines. The data of Tables 3-29 and 3-30, and the conclusions made within paragraph 3.4.2.6.3 represent a snapshot in time, valid only for the ERPGs used in the analysis. Changes to those ERPGs may impact the number of hazardous constituents that require additional evaluation prior to acceptance at WRAP - which must be accounted for in the facility implementing procedure (*Nonradiological Hazardous Constituent Review*, WMH-370, Section 2.4) and the associated database (*Solid Waste Engineering Analysis (SWEA) Database*). If ERPGs are not available for a hazardous constituent, other limits shall be established following the guidance of

Control of Nonradiological Constituents in WRAP, HNF-2205, and the methods set forth in *Methodology for Deriving Temporary Emergency Exposure Limits (TEELs) (U)*, WSRC-TR-98-00080. Updates to the ERPGs/TEELs (such as from *WSMS-SAE-00-0052, SWEATEEL Update February 2000*, Westinghouse Safety Management Solutions, LLC, D. K. Craig) and to the implementing procedure and database shall be documented and made on an annual basis as a minimum. However, changes to the FSAR text and to Tables 2-11, 3-29, and 3-30 will be held until the annual FSAR revision. If nonradiological contents of a waste container are discovered to be higher than the analyzed limit, appropriate recovery actions will be implemented to maintain the established limit. To maintain FSAR compliance, the initial recovery action will be completed within 4 hours. If the initial recovery action is to remove the container from the facility, an analysis must be completed before the container can be returned to WRAP.

BASIS: Chapter 3.0 did not analyze the consequences of drums/wooden boxes containing more than 35.0 DE-Ci being involved in any accident. For SWBs and Type A metal boxes, Chapter 3.0 did not analyze the consequences of a box containing more than 56.9 DE-Ci. A 177 gram limit of plutonium-239 FGE in designated isolated facilities is required by the Isolated Facility Nuclear Safety Classification. Nonradiological hazardous exposures were evaluated using MARs that ensure toxic material accident consequences do not exceed allowable concentration values (such as ERPG, TEEL, and/or other approved concentrations) for facility workers, colocated workers, and the public.

5.5.7 Combustible Loads

A program shall be implemented to control building combustibles so as to remain within the inventory analyzed in Chapter 3.0 and enumerated in Chapter 11.0, Section 11.4.3.

BASIS: Combustible loads are controlled within WRAP through implementation of this TSR and good housekeeping practices to ensure that there are no credible fire accident scenarios whose consequences exceed those analyzed in Chapter 3.0.

5.6 DESIGN FEATURES

The purpose of this section is to identify the passive design features that are not specifically required to have TSRs according to DOE Order 5480.22. Design features are those features not covered elsewhere in the TSRs and that, if altered or modified, would have a significant effect on safety. Design features normally are permanently built-in features that do not require, or infrequently require, maintenance or surveillance and normally are not subject to change by operations personnel. A design features appendix is included in the TSRs. The categories of design features to be addressed in accordance with DOE 5480.22 include the following:

- Vital passive components such as piping, vessels, supports, confinement structures, and containers

- Configuration and physical characteristics of the facility that could cause safety concerns such as the locations of public access roads, co-located facilities, facility area boundaries, site boundaries, and distances to residences

- Building materials, if the safe operation of the facility depends on any component being constructed of a particular material.

Changes to design features are considered significant modifications. The USQ process required by DOE 5480.21 ensures that changes to design features are appropriately analyzed and controlled so that the changes do not adversely affect safe operation of the facility. The design features of WRAP that would have a significant effect on safe operation if altered or modified are, by functional area, as follows:

Shipping and Receiving Area

- The AS/RS maintains structural integrity during a seismic event to prevent drums from falling and rupturing, and maintains the drum array and stacking integrity.

- A concrete shield wall around the AS/RS/TRUPACT payload storage unit provides worker protection from radiation.

Nondestructive Examination/Nondestructive Assay Area

- Shielding on all examination stations provides for worker protection from radiation.

Waste Drum Processing Area

- Process enclosures provide the primary containment for opened drums and provide protection to the facility worker in case of a fire or explosion within the process enclosures. The process enclosures (bottom, sides, ends, top, and viewing windows) are all designated as safety-significant SSC. A listing of the safety significant component boundaries can be found in the HNF-1936, *Waste Receiving and Processing Facility Safety Equipment List*.

- Concrete shield walls around the drum buffer storage area provides worker protection from radiation.

5.7 INTERFACE WITH TECHNICAL SAFETY REQUIREMENTS FROM OTHER FACILITIES

There are no TSR interfaces from other facilities that affect the WRAP safety basis.

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CONTENTS

6.0 PREVENTION OF INADVERTENT CRITICALITY 6-1

6.1 INTRODUCTION 6-1

6.2 REQUIREMENTS 6-1

6.3 CRITICALITY CONCERNS 6-1

6.4 CRITICALITY CONTROLS 6-3
6.4.1 Engineering Controls 6-4
6.4.2 Administrative Controls 6-4
6.4.3 Application of Double-Contingency Principle 6-5

6.5 CRITICALITY PROTECTION PROGRAM 6-5
6.5.1 Nuclear Criticality Safety Program 6-5
6.5.2 Criticality Safety Plans and Procedures 6-7
6.5.3 Criticality Safety Training 6-8
6.5.4 Determination of Operational Nuclear Criticality Limits 6-8
6.5.5 Criticality Safety Inspections/Assessments 6-9
6.5.6 Criticality Infraction Reporting and Followup 6-9

6.6 CRITICALITY INSTRUMENTATION 6-9

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6.0 PREVENTION OF INADVERTENT CRITICALITY

A summary of the evaluation and a description of the specific elements of the Hanford Site criticality safety and protection program as they apply to the WRAP facility are provided in this chapter. Program elements and procedures resulting from the evaluation provide assurance that the appropriate controls are in place to eliminate any likelihood of an inadvertent nuclear criticality.

6.1 INTRODUCTION

Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports (DOE-STD-3009-94) indicates that this chapter applies to facilities with inventories of fissile materials sufficient to present an inadvertent criticality hazard. Because some of the waste processed in WRAP contains fissile radionuclides, the possibility of an inadvertent criticality was examined.

6.2 REQUIREMENTS

Requirements for this chapter are identified in DOE Order 5480.23 and its format and content follow the guidelines provided in DOE-STD-3009-94. A graded approach is applied consistent with requirements of DOE Order 5480.23 and the guidance in DOE-STD-3009-94 such that the level of analysis and documentation is commensurate with the magnitude of the hazards, the complexity of the process, and the stage of the facility life cycle.

Facility specific requirements are contained in the *Waste Management Operations Standards and Requirements Identification Document* (S/RID) (HNF-SD-MP-SRID-011).

6.3 CRITICALITY CONCERNS

Hanford Site facilities that contain or could contain more than 3 percent of a minimum critical mass are classified into one of the following three categories:

- **Fissionable Material Facility**--A facility in which more than one-third of a minimum critical mass of fissionable material is permitted outside the confines of a reactor core and that is not classified as a limited control facility

- **Limited Control Facility**--A facility that could contain more than one-third of a minimum critical mass of fissionable material, the form or distribution of which ensures that a safe mass cannot be exceeded

- **Isolated Facility**--A facility that contains at least 3 percent but less than one-third of a minimum critical mass and is physically isolated from other buildings or locations containing fissionable material.

WRAP shipping and receiving and NDE/NDA areas are classified as limited control areas (WHC-SD-SQA-CSA-516). In these areas, a subcritical configuration exists by reason of the form and distribution of the fissionable material. The waste process area, which includes the sorting and repackaging area where fissionable material could be redistributed within the TRU enclosure, is classified as up to three isolated facilities (WHC-SD-SQA-CSA-510).

For the limited control area, the criticality safety evaluation demonstrates that criticality is prevented by the form or distribution of the fissionable material after allowing for credible accidents. Criticality safety requirements are designated by this FSAR and criticality safety postings.

Based on this facility classification, the following requirements apply to WRAP (this is not an all inclusive list):

- Appointment of a criticality safety representative
- Training for fissionable material workers on criticality safety requirements
- Incorporation of criticality safety requirements into the FSAR
- Criticality safety prevention specifications based on criticality safety requirements and criticality safety evaluations
- Posting of criticality safety requirements
- Periodic criticality safety inspections.

To ensure that a criticality event is not credible, inventory and operational controls have been instituted and concentration and/or mass of the fissionable material is controlled.

Containers of TRU waste and LLW will be received and processed in WRAP. The waste form is primarily contaminated solid material, such as paper and plastics, that has been used in cleanup or disposal operations and contaminated equipment items that have been decontaminated to the extent practical. Significant quantities of the fissionable materials contained in the waste are not easily separated or concentrated due to the waste form. Under planned operational conditions, an accidental criticality is considered to be incredible because of the fissionable material mass controls placed on waste generators and the form and distribution of the waste accepted into WRAP.

The only area where the potential could exist for an inadvertent criticality is the TRU portion of the waste process area. In the shipping and receiving and NDE/NDA areas, the fissionable material contained in waste containers is received in a safe configuration and the containers are not opened. The material thus cannot be redistributed to accumulate to the critical mass level and/or the distribution of material within the storage containers cannot be changed. However, in the waste process area where sorting and repackaging are done, which includes the LLW processing line, the TRU processing line, and the LLW and TRU RWM process lines, the contents of

individual drums can be modified. The TRU processing line contains an enclosure where the contents of waste drums can be removed and TRU material can be repackaged or sent to the RWM line for processing and repackaging. Reloaded processed drums exit the facility through the NDE/NDA and shipping and receiving areas.

Repackaging of Special Nuclear Material sealed sources will occur in the Shipping/Receiving and NDE/NDA Areas. This evolution has been analyzed (HNF-2594) for criticality considerations and a criticality has been determined to be incredible based on the form and distribution of the material. Only one source is moved from or to storage at a time. Constraints are placed on storage shelves and/or drawers to ensure material does not fall out during storage. Loaded test containers in storage are also constrained by a chain or strap attached to a stationary upright structure such as a wall, column, or chain link fence. To remain bounded by the Chapter 3.0 accident analyses, unsealed Special Nuclear Material shall not be repackaged in the Shipping/Receiving & NDE/NDA Areas but shall remain in their shipping containers during NDA unit calibration activities.

The redistributions in the TRU line are from drums that average approximately 11 grams TRU. The majority of transfers will be made to eliminate noncompliant constituents in drums. The forms and distributions of the fissionable material in the waste drums are not easily changed or separated. Therefore, the potential for an inadvertent criticality is not considered credible. Even so, the process area has been designated as up to three isolated facilities, thus limiting the total amount of TRU material that can be accumulated there. Control of the allowable inventory to one-third of the minimum critical mass within a designated isolated facility ensures that an inadvertent criticality is not credible.

According to existing records, a single container from the LLBG could contain up to 335 grams of TRU. As discussed in Chapter 3.0, the types and quantities of material handled will be within the approved facility safety basis.

6.4 CRITICALITY CONTROLS

The technical bases for criticality controls in WRAP are established by criticality safety evaluations (CSE). The purpose of a CSE is to analyze the handling of fissile material under normal and credible abnormal conditions, and to determine the limits, controls, and engineered features necessary to ensure that an acceptable margin of subcriticality is maintained for normal and credible abnormal conditions. An appropriate evaluation is required for any new or modified activity involving fissionable materials that is not in the scope of existing CSEs. This includes activities in which fissionable material is to be handled in a new or modified location, a change in physical form of material to be handled, or a change in storage method. Requirements for the technical analyses in a criticality safety evaluation report (CSER) include requirements for fissionable material form and quantities, neutron moderation, neutron reflection, neutron absorption (poisons), and neutron interactions. Computer codes and cross-section libraries are used to assist in criticality safety analysis.

CPS are developed on the basis of technical analyses in the CSER. The CSER states the limits and applicable controls that must be observed for criticality safety in a specified area or operation and rules are provided for the safe handling of fissionable material. Requirements regarding the applicable responsibilities, review procedures, requirements, and content for criticality prevention specifications are implemented as required by Waste Management Operations S/RIDs.

Applicable criticality controls for the handling and storage of waste materials in WRAP are presented in the remainder of this chapter. Engineering and administrative controls and application of the double-contingency principle are discussed in the following sections. These sections are not intended to provide a listing of criticality safety design limits. Rather, the information presented is to demonstrate compliance with applicable criticality safety prevention requirements.

6.4.1 Engineering Controls

Engineering controls are based on physical design limitations placed on equipment size, shape, and location, or on physical limitations of chemical processes. Engineering controls in WRAP consist of reducing the possibility of optimal conditions for moderation.

Water sources are restricted within the process enclosure (WHC-SD-SQA-CSA-20366). There are no liquid connections to the enclosure. Dry chemical sprinklers are used for fire control inside the enclosure.

Array stacking and spacing limits for drums being staged for handling or in temporary storage are established by features incorporated into the facility design. For example, the shipping and receiving maximum concentration and tightest spacing are established by the three-tier AS/RS. The AS/RS and TRUPACT container loading areas are the only locations in WRAP where material normally is stacked higher than a single tier.

Drums containing waste to be processed are opened only in enclosures that have one or more individual confinement barriers and HEPA filters to prevent the release or accumulation of fissionable materials in ductwork. Material is accounted for before introduction into an isolated facility, during processing, and after removal from an isolated facility. All material discrepancies will be documented, evaluated, and dispositioned before introducing additional material into the process area and TRU enclosure.

6.4.2 Administrative Controls

Administrative controls prescribe procedures or action, judgment, and responsibility of personnel to achieve safe operation.

The possibility of an inadvertent criticality in WRAP is eliminated by restricting inventory in the WRAP isolated facilities or in any single drum where the form and distribution are subject to change. The limits specified restrict the inventory to less than one-third of the minimum critical mass and are based on the definition of an isolated facility. Containers are identified by record and assay before selection for processing in the areas

designated as isolated facilities. Labeling and documentation track the level of fissionable material in containers. Validated spreadsheets and the plant computer systems track the amount of fissionable material in the isolated facilities.

Containers are inspected (NDE/NDA, physical inspections, content inventory, etc.) to ensure the containers are within the analyzed safety envelope and meet waste acceptance criteria (HNF-EP-0063). WRAP will not accept any container for processing without the proper labeling/manifests and without completion of the appropriate surveys.

Processing in each WRAP isolated facility is batched in sets of drums containing a total inventory of less than one-third of the minimum critical mass so as not to exceed the requirements for an isolated facility. A running inventory of fissionable material in each isolated facility is maintained.

6.4.3 Application of Double-Contingency Principle

The double-contingency principle maintains that more than two unlikely, independent, and concurrent changes (contingencies) in processing and/or operating conditions must occur before a criticality accident is possible. Double contingency is implemented at WRAP through the control of process parameters such as fissionable mass limits on waste containers, distribution of the mass, and control of fissionable mass limits in the WRAP isolated facilities.

Double contingency is maintained in the WRAP Process Area with fissionable mass limits on waste containers, by defining the Process Area as up to three isolated facilities, and limiting the total allowable fissionable material in each isolated facility to one-third the minimum critical mass or less. More than two concurrent violations are required before a criticality can occur.

6.5 CRITICALITY PROTECTION PROGRAM

The criticality safety program applicable to WRAP on a graded basis is the responsibility of the facility management as described in Waste Management Operations procedures. These procedures implement the requirements from HNF-SD-MP-SRID-011.

6.5.1 Nuclear Criticality Safety Program

Representative criticality safety program responsibilities are summarized in this section. The nuclear safety program organization including assignment of nuclear safety job responsibilities is discussed in the Nuclear Criticality Safety Manual. These responsibilities, listed below, are assigned to FDH Environmental, Safety & Health (Chapter 17.0, Figure 17-1), and include but are not limited to the following:

- Design and implement the PHMC criticality safety program

- Identify and interpret the relevant DOE and U.S. DOE, Richland Operations Office (DOE-RL) Orders and national consensus standards

- Develop, document, or present criticality safety requirements (i.e., review packages, action letters, records of decisions, conflict resolution results, standards/programs)

- Coordinate and support development of implementation plans for criticality safety requirements

- When requested, assist the line organization by performing periodic criticality safety inspections and annual management assessments to verify compliance with criticality safety requirements

- Approve the criticality safety classifications of facilities

- Represent the PHMC with national organizations for criticality related issues

- Review and evaluate criticality safety training courses and examinations

- Review the established criteria for the prevention of an inadvertent criticality

- Review and approve the following:

  - CSERs and CPSs

  - Designs for fissionable material handling, processing, storage, and transportation equipment

  - Design features with criticality safety functions

  - Design, placement, calibration, and testing of criticality alarm systems and nuclear accident dosimeters

  - Evaluations identifying areas within facilities that require criticality detector coverage

  - Administrative and operating procedures for fissionable material handling, processing, storage, or transportation.

- Provide safety review of all criticality specification nonconformance and approve corrective actions

- Approve CPS infraction and violation recovery plans

- Perform annual assessments of the criticality safety programs at each facility. A criticality safety specialist will participate in these annual assessments

- Upon request, assist the line organization in performing periodic criticality safety inspections to verify compliance with criticality safety requirements.

WRAP specific criticality safety responsibilities are described in Chapter 17.0, Section 17.3.2.

6.5.2 Criticality Safety Plans and Procedures

Plans and procedures have been implemented to control operations involving fissionable materials. The CSER is used to analyze the handling of fissionable material under normal and credible abnormal conditions. The CSER also determines the limits, controls, and engineered features necessary to ensure that an acceptable margin of subcriticality is maintained. Requirements for the preparation and approval of CSERs are implemented as required by Waste Management Operations S/RIDs. The CPSs are developed on the results and conclusions from the CSER. A CPS provides rules for the safe handling of fissionable material.

CSER documents contain information such as the introduction and summary of limits and controls, description of the facility or operation, a list of requirements uniquely applicable to the evaluation, description of the method of analysis and results, and a contingency analysis.

Newly prepared CPSs contain information such as a description of type and form of the fissionable material(s) that can be handled; a description of operations and equipment; specification of additional controls to support the technical limits; and supporting information, including references to the appropriate CSER.

Each manager with custody of fissionable material is responsible to ensure that approved CSERs and CPSs are in place and that necessary controls are implemented before fissionable material is handled.

Criticality safety uses four firefighting categories. The category depends on the risk for a criticality accident caused by adding water to a fire in a specified area. Firefighting restrictions, as part of the CSE, are incorporated in the prefire plan for the facility. The firefighting categories allow the maximum use of water for fire fighting in facilities containing fissionable material. Facilities (or areas within facilities) are categorized and posted to denote the firefighting agents that can be used safely. Standard symbols for each category are defined and requirements for posting and reviewing the firefighting categories at each facility have been established. The four firefighting categories are described as follows.

- **Category A** — An area with no possibility of criticality if water is used to fight fires because little or no fissionable material is present. Firefighting methods are not restricted by criticality safety.

- **Category B** — An area in which the use of water to fight fires can violate a criticality safety limit (such as a spacing requirement); however, double contingency will be maintained and criticality cannot occur. Water in any form can be used in any amount.

- **Category C** — An area in which fissionable material is present in amounts and configurations that could be made critical by the

combination of fire, consequential conditions, addition of water, and concurrent rearrangement of the fissionable material. Solid-stream water must be excluded to avoid excessive material rearrangement. The only forms of water that can be used are high expansion foam, automatic sprinkler systems, limited water-volume systems, or hose fog nozzles.

- **Category D** — An area in which criticality safety requires the exclusion of moderators. Only dry chemicals, gases (e.g., CO_2, inert gases), or high expansion foam can be used to fight a fire. Special firefighting methods are preapproved by the Hanford Fire Department, Operations, and Safety.

The enclosures within the waste process area are conservatively classified as Category D and provided with local area automatic and manual dry chemical systems. Automatic sprinklers cover the remainder of the building.

6.5.3 Criticality Safety Training

This section summarizes the criticality safety training program and training requirements for WRAP personnel. Implementation of the WRAP training program which includes criticality safety training is discussed in Chapter 12.0. Job descriptions and specific training requirements are included in WMH-200 as discussed in Chapter 12.0.

The purpose of the criticality safety training program is to provide personnel with an appropriate understanding of the following:

- The importance of criticality safety
- The rules for preventing a criticality when handling, processing, transporting, or storing fissionable material
- Emergency procedures.

Training requirements for each job category are specified including testing requirements, a facility-specific orientation designed to meet specific job requirements, retraining, documentation, periodic criticality safety meetings, and training records management.

6.5.4 Determination of Operational Nuclear Criticality Limits

The technical bases for criticality limits are established in the operation or facility-specific CSERs. WRAP shipping and receiving and NDE/NDA areas are classified as limited control areas (WHC-SD-SQA-CSA-516). In these areas, a subcritical configuration exists by reason of the form and distribution of the fissionable material. The waste process area, which includes the sorting and repackaging area where fissionable material could be redistributed within the TRU enclosure, is classified as up to three isolated facilities (WHC-SD-SQA-CSA-510).

6.5.5 Criticality Safety Inspections/Assessments

Inspections are performed as required by the *Waste Management Operations* S/RID (HNF-SD-MP-SRID-011), safety organization, and facility personnel. These assessments and inspections emphasize the identification of conditions or practices that increase the risk of a nuclear criticality accident and corrective actions. Records of the corrective actions are maintained.

6.5.6 Criticality Infraction Reporting and Followup

Operating organizations that are custodians for fissionable material are responsible for appropriate notifications of CPS nonconformances and for obtaining technical assistance.

6.6 CRITICALITY INSTRUMENTATION

WRAP is designated as a limited control facility with the exception of the waste processing area, which is designated as up to three isolated facilities. The process area has been designed to accommodate designation as a fissionable material facility, if this is needed in the future.
A criticality detection (gamma) and alarm system has been installed to maintain versatility of the facility. Such a system is not required for WRAP limited control or isolated facility operations and is presently not operational.

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DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	WRAP Engineering	Date May 10, 2000
Project Title/Work Order		EDT No. N/A
HNF-SD-W026-SAR-002, Rev.1-A, WRAP FINAL SAFETY ANALYSIS REPORT		ECN No. 657510

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
HC Boynton	T4-52	X			
MS French	S7-55	X			
JE Geary	T4-51	X			
CE Taylor	T4-52	X			
RL Higgins	T4-52	X			
JE Johnson (Required Reading)	T4-51	X			
JK Kersten	T4-52	X			
RM Nelson	T3-06	X			
SL Kooiker	T4-51	X			
RR Bloom	T4-51	X			
DN Stewart	T4-51	X			
KJ Svoboda	H6-06	X			
WR Thackaberry	T4-52	X			
TA Tomaszewski	T4-52	X			
JD Voice	H6-60	X			
JR Weidert (2)	T4-52	X			
NP Willis	T4-52	X			
Central Files	B1-07	X			
DOE/RL Reading Room	B1-07	X			
EDMC	H6-08	X			
WMFSH	L4-97	X			