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Weapons and Complex Integration
Radioactive and Hazardous Waste Management Division

Technical Safety Requirements for the Waste Storage Facilities

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INTRODUCTION

This document contains Technical Safety Requirements (TSR) for the Radioactive and Hazardous Waste Management (RHWM) WASTE STORAGE FACILITIES, which include Area 625 (A625) and the Decontamination and Waste Treatment Facility (DWTF) Storage Area at Lawrence Livermore National Laboratory (LLNL). The TSRs constitute requirements regarding the safe operation of the WASTE STORAGE FACILITIES. These TSRs are derived from the *Documented Safety Analysis for the Waste Storage Facilities* (DSA) (LLNL 2008). The analysis presented therein determined that the WASTE STORAGE FACILITIES are low-chemical hazard, Hazard Category 2 non-reactor nuclear facilities. The TSRs consist primarily of inventory limits and controls to preserve the underlying assumptions in the hazard and accident analyses. Further, appropriate commitments to safety programs are presented in the administrative controls sections of the TSRs.

The WASTE STORAGE FACILITIES are used by RHWM to handle and store hazardous waste, TRANSURANIC (TRU) WASTE, LOW-LEVEL WASTE (LLW), mixed waste, California combined waste, nonhazardous industrial waste, and conditionally accepted waste generated at LLNL as well as small amounts from other U.S. Department of Energy (DOE) facilities, as described in the DSA. In addition, several minor treatments (e.g., size reduction and decontamination) are carried out in these facilities.

The WASTE STORAGE FACILITIES are located in two portions of the LLNL main site. A625 is located in the southeast quadrant of LLNL. The A625 fenceline is approximately 225 m west of Greenville Road. The DWTF Storage Area, which includes Building 693 (B693), Building 696 Radioactive Waste Storage Area (B696R), and associated yard areas and storage areas within the yard, is located in the northeast quadrant of LLNL in the DWTF complex. The DWTF Storage Area fenceline is approximately 90 m west of Greenville Road. A625 and the DWTF Storage Area are subdivided into various facilities and storage areas, consisting of buildings, tents, other structures, and open areas as described in Chapter 2 of the DSA. Section 2.4 of the DSA provides an overview of the buildings, structures, and areas in the WASTE STORAGE FACILITIES, including construction details such as basic floor plans, equipment layout, construction materials, controlling dimensions, and dimensions significant to the hazard and accident analysis.

Chapter 5 of the DSA documents the derivation of the TSRs and develops the operational limits that protect the safety envelope defined for the WASTE STORAGE FACILITIES. This TSR document is applicable to the handling, storage, and treatment of hazardous waste, TRU WASTE, LLW, mixed waste, California combined waste, nonhazardous industrial waste, and conditionally accepted waste received or generated in the WASTE STORAGE FACILITIES. Section 5, Administrative Controls, contains those Administrative Controls necessary to ensure safe operation of the WASTE STORAGE FACILITIES. Programmatic Administrative Controls are in Section 5.6.

This Introduction to the WASTE STORAGE FACILITIES TSRs is not part of the TSR limits or conditions and contains no requirements related to WASTE STORAGE FACILITIES operations or to the safety analyses of the DSA.

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SECTION 1
USE AND APPLICATION

1.1 Definitions

NOTE: Terms defined in this list appear in uppercase type throughout these Technical Safety Requirements (TSRs).

Term	Definition
APPROVED TRU WASTE CONTAINER	Following is a description of the containers satisfying the free drop test performance criteria for Type A packaging (see 49 CFR 173.465(c)(1) for the applicable package mass) used to store TRU WASTE in the WASTE STORAGE FACILITIES. • DOT 17C, 17H or UN1A2 steel drums with vents (waste containers accepted as LLW and converted to TRU WASTE after assay are not required to have vents). • Standard waste boxes (SWBs) refers to oval-shaped steel containers with vents, roughly 3-ft H × 6-ft L × 4.5-ft W, designed for efficient loading into TRUPACT II Type B shipping containers. • TRU oversize boxes refers to unvented steel containers, rectangular in shape. Built to contain large pieces of contaminated equipment, the dimensions of each TRU oversize box are unique. Heights vary from approximately 53-in to 101-in, widths vary from approximately 47-in to 70-in, and lengths vary from approximately 78-in to 138-in. • Other steel containers with vents satisfying the free drop test performance criteria for Type A packaging (e.g., ten drum overpacks, 85-gal drums).
LOW-LEVEL WASTE (LLW)	Waste containing radioactive components that do not meet the definition of TRANSURANIC (TRU) WASTE.
MAY	Denotes an acceptable, but not required, way to maintain the requirements, assumptions, or conditions of the facility safety basis.
PLUTONIUM-239 EQUIVALENT CURIES (PE-Ci)	The Pu-239 equivalent activities of different radionuclides are determined using radionuclide-specific weighting factors as described in DOE/WIPP-02-3122, Appendix B (DOE 2005).
SHALL	Denotes a mandatory requirement that must be complied with.

Term	Definition
SHOULD	Denotes the responsibility of either following the TSR as specified or in a manner that meets the intent of the TSR. The use of "should" recognizes that there may be site- or facility-specific attributes that warrant special treatment and that literal compliance with the TSR may not be required to maintain the requirements, assumptions, or conditions of the facility safety basis.
SPECIFIC ADMINISTRATIVE CONTROL (AC)	An AC that provides a specific preventive or mitigative function for accident scenarios identified in the DSA where the safety function has importance similar to, or the same as, the safety function of a safety SSC (e.g., discrete operator actions, combustible loading program limits, hazardous material limits protecting hazard analyses or facility categorization).
TRANSURANIC (TRU) WASTE	Without regard to source or form, waste that is contaminated with alpha-emitting transuranic radionuclides (elements above uranium in the periodic table [i.e., atomic number greater than 92]) with half-lives greater than 20 years and concentrations greater than 100 nCi/g at the time of assay.
WASTE STORAGE FACILITIES	A collective term referring to Area 625 (A625) and the Decontamination and Waste Treatment Facility (DWTF) Storage Area of Lawrence Livermore National Laboratory.

1.2 Operational Modes

Facility modes are not required since there are no Limiting Conditions for Operation. The facilities will be performing their mission throughout the operational life of the facility. RHWM has determined that this section is not applicable to the WASTE STORAGE FACILITIES. This section was retained for consistency with the TSR numbering system.

1.3 Frequency Notation

No Surveillance Requirements have been identified as necessary to support the safety analysis for the facility; therefore, no frequency notations have been included in this TSR. This section was retained for consistency with the TSR numbering system.

1.4 Abbreviations and Acronyms

The following abbreviations and acronyms are used in this document.

Abbreviation or Acronym	Definition
AC	Administrative Control
CFR	Code of Federal Regulations

Abbreviation or Acronym	Definition
Ci	Curies
CM	Configuration management
DBE	Design Basis Earthquake
DBW	Design Basis Wind
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DSA	Documented Safety Analysis
DWTF	Decontamination and Waste Treatment Facility
ES&H	Environment, Safety, and Health
FGE	Fissile Gram Equivalent
FPOC	Facility Point of Contact
FSP	Facility Safety Plan
ISMS	Integrated Safety Management System
LCO	Limiting condition for operation
LLNL	Lawrence Livermore National Laboratory
LLW	Low-level waste
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
PC-2	Performance Category 2
PE-Ci	Plutonium equivalent Curie
PrHA	Process Hazard Analysis
QA	Quality assurance
RHWM	Radioactive and Hazardous Waste Management
SCIL	Single Container Inventory Limit
SL	Safety limit
SR	Surveillance requirement
SSCs	Structures, systems, and components
TRU	Transuranic
TSR	Technical Safety Requirement
USQ	Unreviewed Safety Question
W&CI	Weapons and Complex Integration

1.5 Safety Limits

No safety limits (SL) have been identified as necessary to support the safety analysis for the WASTE STORAGE FACILITIES; therefore, none has been included in this TSR document. Although SLs are not applicable, the section has been retained for consistency with the TSR section numbering system.

1.6 Limiting Control Settings

Operation of the WASTE STORAGE FACILITIES includes no SLs; therefore, limiting control settings are not applicable. However, this section was retained for consistency with the TSR section numbering system.

1.7 Limiting Conditions for Operation

No limiting conditions for operation (LCO) have been identified as necessary to support the safety analysis of the WASTE STORAGE FACILITIES DSA; therefore, none have been included in this TSR document. However, this section was retained for consistency with the TSR section numbering system.

1.8 Surveillance Requirements

No surveillance requirements (SRs) have been identified as necessary to support the safety analysis of the WASTE STORAGE FACILITIES DSA; therefore, none have been included in this TSR document. However, this section was retained for consistency with the TSR section numbering system.

SECTION 2
SAFETY LIMITS

2.1 Safety Limits

There are no safety limits.

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SECTION 3/4
LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.1 General Application

There are no limiting conditions for operations (LCOs) or related surveillance requirements (SRs).

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SECTION 5
ADMINISTRATIVE CONTROLS

5.1 Contractor Responsibility

The Radioactive and Hazardous Waste Management (RHWM) Division Leader/Deputy Division Leader SHALL be responsible for overall facility operation and SHALL delegate in writing the succession to this responsibility to a qualified individual during each absence.

5.2 Contractor Organization

5.2.1 Site Organization

The management team of LLNS, LLC operates and maintains nuclear facilities in a safe, secure, and compliant manner to effectively achieve Laboratory mission objectives. Each of these facilities is managed under a matrix organization. Weapons and Complex Integration (W&CI) has line responsibility. They execute the scope, manage the budget and schedule, and provide day to day direction of the facility managers assigned to Nuclear Operations. The nuclear facility managers are matrixed from Nuclear Operations into the W&CI principal directorate. In this role, they are accountable to the Nuclear Material Technology Deputy Principal Associate Director for the safe and compliant operation of the facility.

5.2.2 Facility Organizations

The RHWM Storage and Disposal Group Leader is responsible for the operational functions in the WASTE STORAGE FACILITIES. The Facility Point of Contact (FPOC) for the WASTE STORAGE FACILITIES is the RHWM Storage and Disposal Nuclear Operations Supervisor. Some of the FPOC responsibilities include concurring that work can be safely performed in the facilities, and working with Responsible Individuals to identify hazards associated with the work location. The FPOC can also participate in pre-start review of work (when one is conducted), evaluate proposed operational or activity changes against the facility's existing environment, safety, and health (ES&H) documentation (e.g., the safety basis), and concur that work can proceed in the WASTE STORAGE FACILITIES, prior to the onset of work.

5.3 Procedures

Facility Safety Plans (FSPs) help to ensure the facilities and operations are managed in a manner that safeguards the workers and protects the environment. In addition, RHWM maintains a number of operational procedures that provide additional instruction to help ensure safe operation of the facility. The FSPs and RHWM procedures that affect safety at the WASTE STORAGE FACILITIES are fully reviewed by management and ES&H personnel, and signed and dated by the reviewers. Distribution is controlled so that only approved documents are available.

5.4 Technical Safety Requirements

5.4.1 General

The TSR document SHALL be prepared, reviewed independently, and approved in accordance with 10 CFR 830, Subpart B.

5.4.2 Compliance

The TSRs SHALL be complied with, except for reasonable action taken in an emergency (see Section 5.4.6, below). RHWM management is responsible for ensuring that the requirements of these TSRs are met. Compliance SHALL be demonstrated by establishing, implementing, and maintaining the required Administrative Controls (ACs) and AC Programs.

5.4.3 Violation of TSRs

Violation of a TSR occurs as a result of failure to comply with an AC statement.

5.4.4 Violation of an Administrative Control

Failure to comply with the specific ACs in Section 5.5 constitutes a TSR violation. For the programmatic ACs listed in Section 5.6, violation occurs when the failure is of sufficient magnitude that the intent of the referenced program is not fulfilled. The U.S. Department of Energy (DOE) SHALL have the right, in consultation with RHWM facility management, to determine if a particular noncompliance will be considered a TSR violation.

5.4.5 Response to an Administrative Control Violation

For all TSR and AC Program failures:

- Place the facility in a safe condition.
- Notify DOE and as necessary, prepare an Occurrence Report in accordance with DOE Order 231.1A (DOE 2003), implemented in Document 4.3, "LLNL Implementation Procedure for Reporting Occurrences to DOE," in the *ES&H Manual* (LLNL latest revision-a).
- Prepare a recovery plan describing the steps leading to compliance with the AC Program. Some failures may be fixed within 72 hours and no plan is prepared.
- Within as short a time as can be safely accomplished after discovery, return the WASTE STORAGE FACILITIES to compliance.

5.4.6 Emergency Actions

Emergency actions MAY be taken that depart from a requirement in the TSR provided that:

- an emergency situation exists;
- these actions are needed immediately to protect the public health and safety; and

- no action consistent with the TSR can provide adequate or equivalent protection.

Such emergency actions will be authorized by the facility manager, designee or incident commander and performed by personnel trained and qualified for the equipment or systems needed to perform the actions. If an emergency action is taken, both verbal notification and a written report will be made within 24 hours to the DOE Livermore Site Office Manager or designee.

5.5 Specific Administrative Controls

This section establishes non-programmatic administrative controls committed to in the WASTE STORAGE FACILITIES DSA, which preserve critical assumptions in the safety analyses.

5.5.1 Inventory

a. AC Statement: For each approved TRU waste container in B696R or B625, the amount of radioactive material shall be no greater than 50 PE-Ci based on Acceptable Knowledge. Drum loading and configuration, shall be administratively controlled to remain consistent with the National Environmental Policy Act (NEPA) bounding consequence calculations.

   Safety Function: A maximum inventory per container of 50 PE-Ci was used as the MAR for most hazard and accident analyses involving TRU waste. Thus, the container inventory limit is an assumed initial condition in the hazard and accident analyses in Sections 3.3 and 3.4 of the Waste Storage Facilities DSA. The SAC protects this assumption and ensures that the consequences determined in the hazard and accident analyses remain bounding.

   Waste Storage Facilities facilities are also required to comply with NEPA analysis in the current LLNL Environmental Impact Statement (EIS). The NEPA analysis establishes a bounding consequence based on overall facility inventory parameters. This SAC also requires that drum loading and configuration, remain within the NEPA bounding consequence calculations. This limit was specifically used for all air craft crash scenarios with fire evaluated in the hazard and accident analysis.

   Basis: This SAC limits the amount of radioactive material that can be impacted by postulated accidents involving TRU waste in the Waste Storage Facilities and maintains consistency with the NEPA bounding consequence calculations

b. AC Statement: For each container, the fissile material inventory SHALL be no greater than 200 Pu-239 fissile gram equivalents (FGE).

   Safety Function: 200 Pu-239 FGE was identified as an assumed condition in the hazard analysis criticality event scenarios. This control serves to limit the quantity of fissile material in each TRU waste container. The material form, packaging and segregation required by the Criticality Safety Program preclude the possibility of an inadvertent criticality for 200 grams of Pu-239. CSM 1344 (LLNL 2003), “CRITICALITY SAFETY EVALUATION On the Use of 200-gram Pu Drum Mass Limit for RHWM Waste Storage Operations,” provides the technical basis for the 200 Pu-239 FGE.

Basis: This SAC limits the amount of fissile material to preclude an inadvertent criticality.

c. AC Statement: The amount of tritium in a waste container SHALL be no greater than 2,000 Ci based on Acceptable Knowledge.

Safety Function: A maximum inventory per container of 2,000 Ci of tritium was used as the MAR for the hazard and accident analyses. Thus, the container inventory limit for tritium is an assumed condition in the hazard and accident analyses in Sections 3.3 and 3.4 of the Waste Storage Facilities DSA, and serves to limit the quantity of tritium that can be impacted in accident scenarios. The SAC protects this assumption and ensures that the consequences determined in the hazard and accident analyses remain bounding.

Basis: This SAC limits the amount of radioactive material that can be impacted by postulated accidents involving LLW containing tritium in the Waste Storage Facilities.

d. AC Statement: TRU WASTE MAY be staged outside the building up to 36 hours and SHALL be limited to arrays with a maximum inventory of 200 PE-Ci per array. Any one array of staged TRU WASTE SHALL be separated from other arrays by no less than 10 feet.

Safety Function: The MAR of 200 PE-Ci was used in the hazard and accident analyses as the maximum inventory for an impacted array of staged waste containers in the yard. Thus, the outdoor array limit is an assumed condition in the hazard and accident analyses in Sections 3.3 and 3.4 of the Waste Storage Facilities DSA, and serves to limit the quantity of radioactive material that can be impacted in accident scenarios involving staged waste.

Staging time limitations for TRU waste containers minimizes the potential for a vehicle collision with staged TRU waste.

By separating arrays 10 feet (HC/AB B696 0301), drums in one array will not fail from exposure to the critical radiant heat flux of 45 kW/m2 (identified in WHC-SD-WM-TRP-246, 1995) from a fire in another array.

Basis: This SAC limits the amount of radioactive material that can be impacted by accidents in the yard.

5.5.2 Storage and Handling

a. AC Statement: TRU WASTE storage SHALL be limited to B696R and B625.

Safety Function: The hazard analysis assumes that TRU waste is stored in building structures meeting PC-2 requirements. In addition, it assumes that TRU waste is not stored coincident with flammable liquid storage areas. This control serves to limit the locations that are authorized to store TRU waste to protect these assumptions.

Basis: This SAC limits the locations that are authorized for TRU waste storage.

b. AC Statement: All TRU WASTE SHALL be stored in APPROVED TRU WASTE CONTAINERS.

Safety Function: Containers provide a confinement function limiting worker exposures and radioactive waste vulnerability in accident scenarios involving containerized TRU waste. Accordingly, TRU waste containers meeting specified criteria were an assumed condition in the hazard and accident analyses for scenarios involving TRU waste. TRU waste containers typically have vents, which minimize the potential for buildup of gases.

Basis: This SAC reduces the frequency of common spill and fire accidents during normal waste-container operations and reduces the probability of breaching of containers stored on either the first or second level during a natural phenomena event. Vents reduce the frequency of buildup of flammable gases from radiolysis which reduces the probability of a deflagration.

c. AC Statement: APPROVED TRU WASTE CONTAINERS SHALL not be stacked more than two levels high. Ten drum overpacks and other APPROVED TRU WASTE CONTAINERS exceeding a nominal height of 4 feet SHALL not be stacked.

Safety Function: Stacking TRU waste containers no more than two high was identified in seismic hazard analysis scenarios as a credited control. Containers meeting the free drop test DOT Type A packaging performance criteria [49 CFR 173.465(c)(1)] are used to store TRU waste. These containers are designed to survive at least a 4-ft drop consistent with the performance criteria for Type A packaging. This SAC serves to ensure that stacked containers will not fall greater than 4-ft in the event of an earthquake, and hence will not breach. Ten drum overpacks are approximately 6-ft in height, and therefore, are not stacked.

Basis: This SAC minimizes the potential for drum failure from toppling since TRU waste containers are designed to withstand a 4-ft drop.

d. AC Statement: APPROVED TRU WASTE CONTAINERS SHALL not be opened in the WASTE STORAGE FACILITIES. The exception is waste that has been converted to TRU WASTE from LLW following acceptance by RHWM.

Safety Function: The hazard and accident analyses assume that TRU waste in the Waste Storage Facilities is maintained in closed containers. The assumed condition in the Waste Storage Facilities DSA for all TRU waste scenarios is that the waste is confined in approved TRU waste containers. Opening TRU waste containers is outside the scope of work at the Waste Storage Facilities.

Basis: This SAC ensures waste is confined in closed metal containers. Opening TRU waste containers is outside the scope of work at the Waste Storage Facilities.

e. AC Statement: APPROVED TRU WASTE CONTAINERS SHALL not be staged less than 130 m from the Greenville Road fenceline (i.e., east of the B693 structure).

Safety Function: The accident analysis in Section 3.4 of the Waste Storage Facilities DSA assumed that releases of TRU waste occurred no less than 130 m from the site boundary (Greenville Road fence line). Thus, this distance is an assumed condition in the accident analysis in Section 3.4 of the Waste Storage Facilities DSA, and serves to limit the consequences to the off-site public.

Basis: This SAC provides assumptions in the DSA since 130 m is the minimum distance to the fence line assumed for postulated TRU waste accidents involving staged waste in the hazard and accident analyses.

f. AC Statement: Only waste in metal containers and on metal pallets SHALL be allowed in TRU WASTE storage areas.

Safety Function: The use of metal containers and pallets for waste stored in TRU waste storage areas limits the potential for fire initiation and propagation during operational or other events in TRU waste storage areas by limiting available combustibles. This is a credited control for waste handling and natural phenomena hazard scenarios in the hazard analysis. This control serves to ensure that low-level, hazardous, and other wastes that can be stored coincident with TRU waste are in non-combustible packaging and on non-combustible pallets.

Basis: This SAC limits the potential for fire initiation and propagation during operational or other events in TRU waste storage areas to mitigate consequences from fires involving TRU waste.

5.6 Programmatic Administrative Controls

This section establishes programmatic administrative controls committed to in the WASTE STORAGE FACILITIES DSA.

5.6.1 Criticality Safety Program

A criticality safety program SHALL be established, implemented, and maintained in accordance with *ES&H Manual* Document 20.6, "Criticality Safety," to ensure that all WASTE STORAGE FACILITIES operations and activities are reviewed, evaluated, and documented by LLNL criticality safety engineers in accordance with all contractor-applicable provisions of DOE Order 420.1A (DOE 2002). Any detailed controls SHALL be documented in the FSPs. Operations and storage of waste in the WASTE STORAGE FACILITIES SHALL be controlled such that an inadvertent criticality event is precluded.

5.6.2 Radiation Protection Program

A radiation protection program SHALL be established, implemented, and maintained to ensure that radiation exposure to employees, subcontractors and visitors is controlled in accordance with requirements of 10 CFR 835, as implemented in Document 20.5, "Occupational Radiation Protection: Implementation of 10 CFR 835," in the *ES&H Manual*.

5.6.3 Hazardous Material Protection Program

A hazardous material protection program SHALL be established, implemented, and maintained to ensure that exposures to employees, subcontractors, visitors, and members of the general public are controlled in accordance with the LLNL Hazardous Materials Protection Program, as implemented in Document 14.1, "LLNL Chemical Safety Management Program," in the *ES&H Manual*.

A portion of the Hazardous Material Protection Program that is unique to the Waste Storage Facilities is the Single Container Inventory Limit (SCIL) Program, which is designed to protect the public and co-located workers from chemical releases. This program limits the quantity of chemical that can be stored in any one container based on a series of criteria such as the toxicity and vapor pressure of the material.

5.6.4 In-service Inspection & Test, and Maintenance Programs

An in-service inspection & test program and maintenance program SHALL be established, implemented, and maintained to ensure the integrity of the Design Features in Section 6. The In-service Inspection & Test Program includes the TRU WASTE container maintenance program and building inspection program as described below. Inspections and tests SHALL be performed by qualified personnel.

A TRU WASTE container maintenance program SHALL be established, implemented, and maintained to preserve container integrity and minimize the likelihood of flammable gas buildup. This program includes:

a. Upon acceptance, visually verifying vents are present on all APPROVED TRU WASTE CONTAINERS, except TRU oversize boxes and LLW converted to TRU WASTE after assay.

b. If a TRU waste container is dropped, the container must be inspected to determine if the drop caused significant damage. The inspection must be performed as soon as the appropriate safety precautions can be implemented, but at least within one working day of the drop. Corrective action, such as overpacking damaged containers, should be implemented as soon as possible.

c. Weekly inspections of TRU WASTE container integrity, to include checks for rusting, corrosion, damage, denting, swelling, and damage to filter vents.

This program is implemented through the FSPs and RHWM procedures.

A building inspection program SHALL be established, implemented, and maintained to ensure that B625 and B696R meet their applicable DOE PC-2 requirements. This program includes inspections every five years or less by a qualified engineer (e.g., structural or civil) to verify that significant physical deterioration or damage of the structural system has not occurred. The partition between B696R and the B696 Solid Waste Processing Area (B696S) is inspected every five years because the partition serves as a boundary between the DWTF Storage Area and the B695 Segment of DWTF. Any deficiencies identified will be evaluated for potential impact on stored TRU WASTE containers and repaired when approved.

This program is implemented through the FSPs and RHWM programs or procedures.

5.6.5 Fire Protection Program

A fire protection program SHALL be established, implemented, and maintained to minimize the likelihood of fire in accordance with all contractor-applicable provisions of DOE Order 420.1A (DOE 2002), as implemented in Document 22.5, "Fire," in the *ES&H Manual* and the FSPs. Key provisions of this program are:

- Combustible loading is limited to an average of 7 pounds of equivalent ordinary combustibles per square foot in fire areas storing TRU WASTE, excluding waste containerized in metal packaging.
- Only incidental quantities of flammable or combustible liquids (less than the exempt quantities for the occupancy type) are allowed, except in designated flammable/combustible liquid storage areas.
- Only non-combustible pallets are used for storing TRU WASTE containers.
- A 20-ft exclusion zone is maintained between the DWTF Storage Area and the B695 Segment of DWTF, except between B696S and B696R, which are separated by a fire-resistive partition. In addition, the exclusion zone is expanded between adjacent roll-up doors in B696 near the segment boundary. This prevents fire from impacting both segments through adjacent roll-up doors.
- Inspection, testing, and maintenance of fire suppression systems is performed based on applicable NFPA requirements.
- The partition between B696R and B696S is inspected monthly.
- Trucks are not allowed inside buildings that are storing TRU WASTE.

This TSR does not prohibit the use of propane, diesel, gasoline, or electric powered forklifts or manlifts. Propane, diesel, and gasoline powered forklifts are not stored inside buildings storing TRU WASTE.

Issues identified from inspection, testing, maintenance, or assessment activities related to the RHWM fire suppression systems and B696S/B696R partition would be evaluated for their impact on the ability of the system to perform its safety function. If the system is found to be impaired such that the safety function is compromised, compensatory measures consistent with NFPA would be implemented to minimize the potential change in the fire hazard.

5.6.6 Emergency Preparedness Program

An emergency preparedness program SHALL be established, implemented, and maintained to ensure that RHWM personnel are trained (in accordance with the RHWM Training Implementation Matrix) to react appropriately to emergencies, whether local or site-wide. This program is implemented in Document 22.1, "Emergency Preparedness and Response," in the *ES&H Manual*, in the RHWM Contingency Plan (LLNL latest revision-b), and in the FSPs. This program includes personnel response procedures and evacuation routes. The *LLNL Emergency Plan* (LLNL latest revision-c) describes the system's organizational elements, interfaces, authorities, responsibilities, resources, and actions to be taken in response to emergencies. The FSPs and the Contingency Plan address short-term response actions that are the responsibility of the RHWM Division.

5.6.7 Configuration Management Program

A configuration management program SHALL be established, implemented, and maintained to ensure consistency between the appropriate design requirements, physical configuration, and documentation of SSCs necessary to protect workers and the public as described in Document 41.2, "Configuration Management Program Description," in the *ES&H Manual*. This program includes designated system engineers. The USQ process is performed in accordance with the LLNL Unreviewed Safety Question process.

5.6.8 Traffic Control Program

A traffic control program SHALL be established, implemented, and maintained to provide protection from vehicular traffic for TRU waste in the yard. The traffic control program is intended to limit the speed of vehicles while in the yard and includes speed limits (15 mph) posted in the yard and vehicles required to stop at the yard gate before entering. This program is implemented through the FSPs.

5.7 Minimum Staffing Requirements

Work activities in the WASTE STORAGE FACILITIES are normally conducted on a single work shift. The normal work shift may be extended to complete a given operation. The RHWM Division Leader determines minimum staffing requirements for operating and maintaining the WASTE STORAGE FACILITIES. At a minimum, two persons are required for movement of TRU WASTE and for sampling waste or conducting waste treatment in the WASTE STORAGE FACILITIES. A single person may perform inspections and maintenance.

5.8 Operating Support

ES&H support organizations provide technical support for radiation safety, fire protection, industrial hygiene, industrial safety, and environmental analysis. The Nuclear Operations Directorate provides support to meet safety basis and criticality safety requirements. Health & safety technicians SHALL be on site when work is being performed and SHALL be on call at all other times. For emergencies (in case of accidents involving radioactive material) after normal working hours, emergency response personnel can be contacted by calling 911. In the event of an emergency, additional LLNL support can be provided as part of the Emergency Preparedness Program.

5.9 Facility Staff Qualifications and Training

A training program SHALL be established, implemented, and maintained to ensure that personnel responsible for RHWM operations are trained and qualified, as applicable, to perform their assigned responsibilities safely. This program includes forklift and crane operators who handle waste containers, or who operate a forklift or crane in the vicinity of waste containers; such personnel SHALL be trained and licensed in accordance with LLNL requirements, with specific reference to safe practices for lifting and handling waste containers. The *Training Implementation Matrix for the Radioactive and Hazardous Waste Management Division* (LLNL latest revision-d) addresses the requirements of DOE Order

5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities* (DOE 1994).

5.10 Operability Definition and Implementation Principles

RHWM Division has determined that this section is not applicable to the WASTE STORAGE FACILITIES. It was retained for consistency with the TSR numbering system.

5.11 Reviews and Audits

Reviews are performed by facility staff to ensure that day-to-day activities are conducted in accordance with the safety basis. Some of these reviews are described in the *Inspection Schedule and Guidance* (LLNL latest revision-e). Technical review, audit, and self-assessment of facility activities and programs that affect safety are performed independent of the facility staff by ES&H personnel and Nuclear Operations Directorate analysts and engineers.

Written records of facility reviews, technical reviews, audits, and assessments SHALL be maintained in accordance with the Quality Assurance Program. In conjunction with the quality assurance program (QA) and the Integrated Safety Management System (ISMS), Configuration Management (CM) ensures the Laboratory achieves its safety goal. The CM Program (LLNL latest revision-f), including the Unreviewed Safety Question (USQ) process, and QA Program provide a systematic process for assuring the status of facility safety basis requirements, and maintaining the appropriate descriptive documentation. The CM Program implements a graded approach, applying greatest rigor to management of configuration items whose failure poses the greatest risks.

5.12 Reporting Requirements

Events and conditions that violate TSR Administrative Control Programs, as defined in Section 5.4.3 and 5.4.4 above, are considered Occurrences. Occurrences SHALL consistently be reported to ensure that both DOE and LLNL line management, including the Office of the Secretary, are kept fully and currently informed of all events that could (1) affect the health and safety of the public; (2) seriously impact the intended purpose of DOE facilities; (3) have a noticeable adverse effect on the environment; or (4) endanger the health and safety of workers. A system SHALL be established for determining appropriate corrective action and for ensuring that such actions are effectively taken. This is implemented in Document 4.3, “LLNL Implementation Procedure for Reporting Occurrences to DOE,” in the *ES&H Manual*. Occurrence reports SHALL be reviewed and approved by LLNL line management.

SECTION 6
DESIGN FEATURES

The following passive SSCs, as described in Chapter 4 of the WASTE STORAGE FACILITIES DSA, are designated as safety significant SSCs and specified as TSR design features:

- APPROVED TRU WASTE CONTAINERS (as defined in Section 1.1 of this TSR) are used to store TRU WASTE in the WASTE STORAGE FACILITIES.
- The B625 and B696R structural systems are maintained to meet applicable PC-2 criteria (i.e., seismic and wind).
- The partition between B696R and B696S is a fire-resistive structure as described in Section 4.4.3.2 of the WASTE STORAGE FACILITIES DSA. The partition reduces the likelihood of fire propagation between B696R and B696S.

These design features SHALL be controlled to maintain their design (as specified in applicable design drawings and specifications) as of the effective date of this TSR document. Modifications or replacements SHALL maintain the same design features and functions as the original, including materials, methods of construction, physical dimensions, and other parameters specified in applicable industry codes and standards, unless engineering analysis demonstrates equivalency.

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SECTION 7
REFERENCES

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LLNL (latest revision-d), *Training Implementation Matrix for the Radioactive and Hazardous Waste Management Division*, Lawrence Livermore National Laboratory, Livermore, CA (UCRL-AR-116655).

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WHC-SD-WM-TRP-246, "Solid Waste Drum Array Fire Performance," Rev. 0, Westinghouse Hanford Company, 1995.

APPENDIX A
SL AND LCO BASES

Because no safety limits (SLs) or limiting conditions for operation (LCOs) have been identified as necessary to support the safety analysis of the RHWM, no bases explaining the reasons for these requirements have been included in this TSR document. Appendix A was retained for consistency with the TSR section numbering system.

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