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Technical Area 54, Area G

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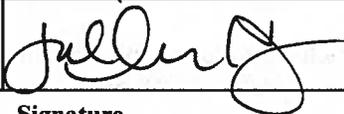
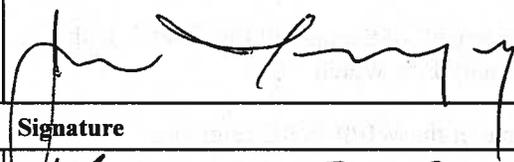
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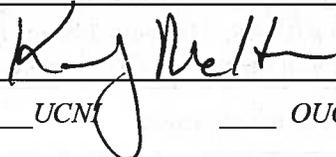
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ABD-WFM-002, Rev. 3.3

Technical Safety Requirements (TSRs) for Technical Area 54, Area G

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Revision Log

Revision No.	Description of Changes	Affected Pages	Date Approved
1.0	Annual Update – new TSR for BIO	All	3/1/2012 (letter SO.26JO-419859)
1.1	<p>90-day resubmittal, including changes required by Conditions of Approval (COA), and Directed Actions (DA):</p> <p>Elevated the 3-inches of overburden control (previously an element of a SMP) to a SAC (LCO 3.1.2, and new definitions for exposed and buried waste) appropriate to the amount of risk it is preventing or mitigating (COA #1).</p> <p>COA#2 required no change to TSRs, which already include a non-sparking tools SAC.</p> <p>COA #3 required no change to TSRs, which already include acetylene flashback arrestor SAC.</p> <p>Updated TSR references to current documents. DA#1, and listed referenced document titles at the end of Section 5.</p> <p>Additional changes to incorporate previous page changes from the DSA/TSR:</p> <p>Incorporated HE-RTR controls (as changed in TSR Rev 0.30), with new definition for HE-RTR Process Area and inclusion of HE-RTR in the Process Area MAR limits in LCO 3.1.4 and Basis.</p> <p>Added definition and clarified LCO 3.4.2 exception for minor movement during unvented drum handling (as changed in TSR Rev 0.31)</p> <p>Clarified notes about minimum staffing in Table 5.2.3-1 (as changed in TSR Rev 0.31)</p>	<p style="text-align: center;">3/4.1-2 through 3/4.1-4</p> <p style="text-align: center;">NA</p> <p style="text-align: center;">NA</p> <p style="text-align: center;">5-1 through 5-26</p> <p style="text-align: center;">3/4.1-7 through 3/4.1-9</p> <p style="text-align: center;">1-5 and 3/4.4-3</p> <p style="text-align: center;">5-4</p>	<p>6/19/12 (letter SO 26BJ-451094)</p>

Revision Log

Revision No.	Description of Changes	Affected Pages	Date Approved
1.1 Cont'd	<p>Added introductory statement before the SACs in Section 5.7 to state that the SACs apply in Operation and Warm Standby modes.</p> <p>Provided clarification in SACs 5.7.4, 5.7.7, 5.7.8, 5.7.9, 5.7.11, and 5.7.13 without changing the control or the intent.</p> <p>Modified Bases to reflect LCO and SR clarifications listed above.</p> <p>Corrected miscellaneous spacing, punctuation, grammar, and capitalization errors, deleted unused acronyms, and updated revision number and date in header and footer on all pages.</p>	<p>5-14</p> <p>5-14 through 5-23</p> <p>A-1 through A-68</p> <p>All</p>	
2.0	<p>Annual Update, including modifications to reflect decreased above ground inventory and to include changes required to address Field Office comments related to control of potential acetylene explosion hazards:</p> <p>In List of Acronyms, deleted MLU and added HE-RTR.</p> <p>Clarified/added definitions for Defined Area, Equivalent Combustible Waste, Fire Watch, Fuel Package, Low Activity Area, Open Container, Process Area, Storage Area, Tritium-Contaminated Waste, Tritium Waste, and Transportation Vehicle.</p> <p>In Table 1.1-1 Use of Modes, modified Operation to include defined terms Tritium Waste and Tritium-Contaminated Waste and modified Warm Standby activity description.</p> <p>In Table 1.4-1, added frequency notation for shiftly operations to support change to SR 4.2.2.4.</p>	<p>xii</p> <p>1-2, to 1-7</p> <p>1-8</p> <p>1-18</p>	<p>8/1/2013 (letter SO: 40BJ-522279)</p>

Revision Log

Revision No.	Description of Changes	Affected Pages	Date Approved
	In LCO 3.1.1, revised the in-process MAR limit for each SSSR Area and included a new MAR limit for staged waste in an SSSR Area. Also revised Mode Applicability statement. Revised Condition statements to reflect new MAR limits, added new action A.2.1, and revised action A.2.3. Revised SR 4.1.1 to reflect new limit for in process MAR and added new SR 4.1.2 for staged MAR.	3/4-4, 3/4-5	
	In LCO 3.1.2, deleted the MAR limit of ≤ 35 PE-Ci Exposed waste per LAA. MAR limit for Exposed tritium-contaminated waste was revised to a total Area G limit. Reduced limit for the total LAA Exposed MAR at Area G from 875 PE-Ci to 100 PE-Ci. Revised Condition statements and SRs to reflect MAR limit changes.	3/4-6, 3/4-7	
	In LCO 3.1.3, included the defined terms Tritium Waste and Tritium-Contaminated Waste and reduced MAR limit for Tritium Waste from 2,000,000 to 1,000,000 tritium Ci. Revised Condition statement and SR to reflect MAR limit change.	3/4-8, 3/4-9	
	In LCO 3.1.4, the MAR limit for Process Areas was limited to the HE-RTR Process Area, only. Reduced the MAR limit for TRU Waste in a Storage Area from 25,000 PE-Ci to 22,000 PE-Ci. Included defined term Tritium Waste. Reduced the MAR limit for Tritium Waste in a Tritium Area from 2,000,000 to 1,000,000 tritium Ci. Added MAR limit of $\leq 4,000$ PE-Ci for total TRU waste in all Process Areas (excluding HE-RTR) and a new LCO which prohibits the storage of TRU waste in a Building or Dome containing a SSSR Area (except as allowed by Note). Added notes to clarify applicability of LCO. Revised Condition statements and SRs to reflect LCO changes including addition of HE-RTR and Tritium Waste in Statement A, new Condition Statements B and C, Tritium Waste to SR 4.1.4.5, and new SRs 4.1.4.6 and 4.1.4.7.	3/4-10 to 3/4-13	

Revision Log

Revision No.	Description of Changes	Affected Pages	Date Approved
	In LCO 3.1.6, reduced total above-ground TRU MAR inventory from $\leq 150,000$ to $\leq 57,000$ PE-Ci, and the total above-ground MAR inventory for tritium waste from 10,000,000 to 4,000,000 tritium Ci. Revised Condition statements and SRs to reflect MAR limit changes.	3/4-15, 3/4-16	
	In LCO 3.2.1, revised LCO (1) statement to change Defined Areas to TRU Storage Areas, Retrieval Areas and all Tritium Areas only. Revised LCO (2) statement to change Defined Areas to TRU Storage Areas and Retrieval Areas only. Editorial change to LCO (3) statement. Added notes and revised existing note to clarify applicability of LCOs. Revised Condition statements and SRs to be consistent with changes to LCOs.	3/4-17, 3/4-18	
	In LCO 3.2.2, changed wording in LCO statement from "Defined Areas" to "applicable Defined Areas". Revised Area Applicability to include exception per note. Numbered notes and added new note to clarify that LCO does not apply to Low Activity Areas. Revised SRs to be consistent with change to LCO. Revised frequency for SR 4.2.2.4 from "Prior to" to "Shiftly" to address potential implementation concern.	3/4-19, 3/4-20	
	In LCO 3.2.3, changed order of action statements A.1 and A.2 regarding the retrieval equipment and Pit 9/ Trench A-D.	3/4-21	
	In LCO 3.3.1, modified Area Applicability Statement, added to Notes, and modified Actions and Completion Times.	3/4-23, 3/4-24	
	In Table 5.2.3-1 Minimum Staffing Requirements, modified Operation (storage) requirements.	5-3	

Revision Log

Revision No.	Description of Changes	Affected Pages	Date Approved
	In SAC 5.7.4, reduced MAR limit for Transportation Vehicle with one or more non-Compliant Metal Containers or non-Metal Containers (without escort) from 550 to 450 PE-Ci. Revised Basis to align with Control Description change.	5-15, 5-16	
	Revised SAC 5.7.9 to make it applicable to all mobile loading payload lifts and not just those associated with use of the Mobile Loader Unit (MLU).	5-19	
	Revised SAC 5.7.13 to clarify that safety function is applicable to a potential explosion that involves MAR. Revised Control Description to prohibit storage or use of acetylene cylinders inside or within 50-feet of Defined Areas. Also revised Basis to support Control Description change.	5-21, 5-22	
	Revised SAC 5.7.14 to align the control description and basis with wording in the approved TSRs Rev. 0.33.	5-22	
	Revised SAC 5.7.15 to align the control description and basis with wording in the approved TSRs Rev. 0.33 and response to CR-8-1.	5-22, 5-23	
	Added new SAC 5.7.17, Stationary Fire Watch During SSSR Activities and associated basis to incorporate related control from DSA.	5-24	
	Modified Bases to reflect LCO, Condition, and SR changes described above.	A-12 to A-64	
	Corrected miscellaneous spacing and capitalization errors, and updated revision number and date in header on all pages.	All	
	Additional changes made in response to Los Alamos Field Office review comments:		
	Acronyms—added HENC, RTR, and TEU	xii, xiii	

Revision Log

Revision No.	Description of Changes	Affected Pages	Date Approved
	<p>Clarified A3.2.2 Control of TRANSIENT COMBUSTIBLES – FUEL PACKAGE Limit to apply to all STORAGE AREAS and PROCESS AREAS but not to LOW ACTIVITY AREAS, and clarified the preventive and mitigative functions of the control.</p> <p>Clarified A3.3.1 Combustible/Flammable Liquid Controls in DEFINED AREAS and associated Thermal Separation Distance is not applicable to LOW ACTIVITY AREAS</p> <p>Additional changes:</p> <p>Modified Table 5.2.3-1, Minimum Staffing Requirements wording of status and notes to more closely align with currently approved and implemented Area G TSR (Rev 0.33). The clarification involves no increase or reduction in required staffing.</p> <p>Clarified definition of DEFINED AREA definition pertains to above ground.</p> <p>Updated BIO date in Bases references</p>	<p>A-48 to A-51</p> <p>A-57</p> <p>5-3</p> <p>1-2</p> <p>A-38, A-60</p>	
2.1	Submitted but not approved		N/A
2.2	Submitted but not approved		N/A
2.3	<p>Cover Page</p> <p>Revision Log</p> <p>List of Affected Pages</p> <p>New Revision No.</p> <p>Modified the definition of ISOLATION AREA to change STORAGE AREA to lower case (to signify the normal English sense, instead of the defined term)</p> <p>Modified the definition of MINOR MOVEMENT to exclude the insertion or removal of a drum from an OVERPACK or DOUBLEPACK</p> <p>Revised Table 1.4-1 to include semiannually notation and corresponding frequency</p>	<p>ix</p> <p>x</p> <p>All</p> <p>1-3</p> <p>1-4</p> <p>1-18</p>	

Revision Log

Revision No.	Description of Changes	Affected Pages	Date Approved
	Revised Mode Applicability in LCO 3.1.1 from “At all times” to “Operation and Warm Standby”	3/4-4	
	Revised Note for LCO 3.1.7 to include exception for waste packaged in a POC, repackaging of a doublepack, and SSSR activities	3/4-17	
	Revised LCO 3.2.1, Item 3 to delete the callout to Processing and to clarify that the identified thermal separation distances are the <i>minimum</i> allowable distances.	3/4-18	
	Revised Area Applicability for LCO 3.4.1 to change the defined term PROCESS AREA to lower case	3/4-27	
	Revised LCO 3.4.2 to delete exception note for retrieval of below-ground waste	3/4-29	
	Revised Area Applicability for LCO 3.5.1 to include exception for LAAs	3/4-32	
	Revised SR 4.5.1.1 frequency to clarify applicability when establishing a Defined Area	3/4-33	
	Modified AC 5.6.11(8) to change TRANSPORT to lower case.	5-13	
	Revised SAC 5.7.12 to address SAC 5.7.18 for an exception for opening sealed inner containers.	5-20	
	Added SAC 5.7.18 Controls for Opening Sealed Containers with Bolted Lids/Flanges During SSSR Activities.	5-24, 5-25	
	Revised DF 6.1.3 to align the control title and applicability for other types of approved Type B containers and to acknowledge recent DOE approval for use of the Model 10-160B container.	6-5	
	Revised Bases A3.1.7 to discuss exception for waste packaged in a POC	A-38	
	Revised Bases A3.2.1 Item 3 to delete the callout to Processing	A-41	
	Revised Bases A3.2.1 to clarify that the identified thermal separation distances are the <i>minimum</i> allowable distances.	A-41, A-42	

Revision Log

Revision No.	Description of Changes	Affected Pages	Date Approved
	<p>Revised Bases A3.4.1 to change the defined term PROCESS AREA to lower case (to signify the normal English sense, instead of the defined term)</p> <p>Revised Bases A3.4.2 to delete exception note for retrieval of below-ground waste and drum handling that does not constitute Minor Movement and to clarify means to restrain drum lid when inserting or removing an unvented drum from a nested configuration</p> <p>Revised Bases A3.5.1 to include exception for LAAs</p> <p>Revised numbering of LCO action statements and corresponding callouts in Bases, as appropriate to use consistent format</p> <p>Revised numbering of SRs and corresponding callouts in Bases, as appropriated to use 4 digit format</p> <p>Revised Bases references to update BIO revision</p>	<p style="text-align: center;">A-60</p> <p style="text-align: center;">A-64</p> <p style="text-align: center;">A-70</p> <p style="text-align: center;">Appropriate pages in section 3/4 and Basis</p> <p style="text-align: center;">Appropriate pages in section 3/4 and Basis</p> <p style="text-align: center;">Appendix A Bases pages, as appropriate</p>	
3.0	<p>Annual Update:</p> <p>Minor clarifications to definitions of High-Risk Location, and Transient Combustibles</p> <p>Deletion of Fire Watch definition as this function is not called upon for any SAC, LCO, or response Action</p> <p>Replacement of the on-call Fire Watch with Stationary Fire Watch.</p> <p>Update of the WIPP-WAC reference</p>	<p style="text-align: center;">Date and Revision Number, all pages</p> <p style="text-align: center;">1-3, 1-5</p> <p style="text-align: center;">1-3</p> <p style="text-align: center;">5-3</p> <p style="text-align: center;">5-26</p>	<p>Approved 2/27/15 (letter OPS:26JR- 605644)</p>

Revision Log

Revision No.	Description of Changes	Affected Pages	Date Approved
	Deletion of extra word (packaged) in section 6.2.1.2	6-6	
	Correction of capitalization error in LCO 3.2.2 Basis where “metal containers” was inadvertently capitalized when only the standard English sense was intended, in reference to fuel package weight derating.	A-47	
	Revised LCO 3.1.6 and Basis to require that all above-ground MAR be located inside appropriate DEFINED AREAS. Also added Notes regarding applicability of the new LCO components.	3/4-14, 15, 16 and A-34,-35,37,-38,-39	
3.1	Submitted but not approved		N/A
3.2	Submitted but not approved		N/A
3.3	Temporary TSR Change to Generic LCO 3.0.4 and Bases A3.0.4 Cover Page Revision Log List of Affected Pages LCO 3.0.4 Bases A3.0.4	xi, xii xii 3/4-2 A-5, -6	

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List of Acronyms

AC	Administrative Control
ALARA	as low as reasonably achievable
BG	Bolas Grande
CFR	Code of Federal Regulations
CMP	Corrugated Metal Pipe
DOE	U.S. Department of Energy
DR	Damage Ratio
DVS	Drum Venting System
FPE	Fire Protection Engineer
FRP	Fiberglass-Reinforced Plywood
FOD	Facility Operations Director
HENC	High-Efficiency Neutron Counter
HE-RTR	High Energy Real-Time Radiography
HW	Hazardous Waste
ISI	In-Service Inspection
LAA	Low Activity Area
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security
LCO	Limiting Condition for Operation
LFL	Lower Flammability Limit
LLW	Low-Level Waste
MAR	Material-at-Risk
MLLW	Mixed Low-Level Waste
NDA	Nondestructive Assay
NDE	Nondestructive Examination
NNSA	National Nuclear Security Administration
NPH	Natural Phenomena Hazards
PE-Ci	Plutonium-239 Equivalent Curies
PISA	Potential Inadequacy of the Safety Analysis
POC	Pipe Overpack Container
QA	Quality Assurance
RANT	Radioassay and Nondestructive Testing

List of Acronyms

RTR	Real-Time Radiography
SAC	Specific Administrative Control
SC	Safety-Class
SOM	Shift Operations Manager
SR	Surveillance Requirement
SRS	Savannah River Site
SS	Safety-Significant
SSC	Structure, System, and Component
SSSR	Sort, Segregate, Size Reduction, and Repackaging
ST	Source Term
SWB	Standard Waste Box
TA	Technical Area
TEU	Temperature Equilibration Unit
TRU	Transuranic
TSR	Technical Safety Requirement
USQ	Unreviewed Safety Question
VOC	Volatile Organic Compounds
WAC	Waste Acceptance Criteria
WCRRF	Waste Characterization, Reduction and Repackaging Facility
WIPP	Waste Isolation Pilot Plant

Introduction

This document establishes the Technical Safety Requirements (TSRs) for Technical Area (TA)-54 Area G site. These TSRs will control receipt, processing, storage, shipment, and/or disposition of LANL's newly generated Low-Level Waste (LLW), Mixed Low-Level Waste (MLLW), Hazardous Waste (HW), tritium contaminated waste, and Transuranic (TRU) Waste, as well as to prepare legacy waste items for shipment to offsite treatment, storage, and disposal facilities. TRU waste is shipped to the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico. The latter activity is critical to meet the New Mexico Consent Order to close TA-54, Area G by 2015. Therefore, TA-54, Area G is considered a limited-life facility. The TSRs contained in this document constitute an agreement between Los Alamos National Security (LANS), LLC and the U.S. Department of Energy (DOE) for operating the TA-54, Area G site. This document supersedes the previous TA-54, Area G Technical Safety Requirement (TSR) document approved in April 2003.

These TSRs are derived from safety requirements developed in the TA-54, Area G Basis for Interim Operations (BIO). These requirements address the minimum performance levels necessary to maintain facility safety at the TA-54, Area G site by eliminating, confining, and mitigating hazards independent of process efficiency or product quality. These TSRs define the Limiting Conditions for Operation (LCOs), actions, and Surveillance Requirements (SRs), the bases thereof, safety boundaries, and safety management programs or Administrative Controls (ACs) necessary to ensure safe operations at the TA-54, Area G site. These requirements protect public health and safety and minimize the potential risk to workers from the uncontrolled release of radiological or other hazardous materials.

The Waste Disposition Project is responsible for TA-54, Area G site operations.

Due to the inventory of radioactive waste presently stored, disposed, and managed at the TA-54, Area G site, the TA-54, Area G BIO establishes the TA-54, Area G site as a Hazard Category 2 nuclear facility.

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1.0 USE AND APPLICATION

SECTION 1.0 USE AND APPLICATION

1.0 USE AND APPLICATION

1.1 DEFINITIONS

NOTE: *The terms defined in this section appear in capitalized type and are applicable throughout this TSR document. When a term defined in this section is not capitalized, it is being used in its common English sense and not as defined in this section.*

Term	Definition
ACTIONS	The mandatory response required to be performed when the specified Limiting Conditions for Operation are not met.
AFFECT	Direct or indirect influence on the performance of, or the configuration of, a DEFINED AREA, or the Area G facility.
ATTEND	<p>A trained individual present to:</p> <ul style="list-style-type: none"> • monitor fire hazards associated with vehicles and/or equipment with combustible/flammable liquids, and respond to or mitigate a fuel spill, or • monitor activities associated with FUEL PACKAGES in a DEFINED AREA to ensure FUEL PACKAGE is protected from fire initiators, and • identify fire initiators and incipient fires and elicit an appropriate response. <p>The ATTEND function helps to prevent and/or mitigate the effect of a fire.</p>
BURIED	Covered with the depth of overburden fill material necessary to be treated as below-ground inventory (when referring to radioactive waste in a pit, trench, or shaft). Not EXPOSED.
COMPLIANT	<p>For the purposes of container storage, processing, HANDLING, and TRANSPORT, a TRU WASTE container that meets the criteria for a container of sound integrity. COMPLIANT containers with TRU WASTE at Area G are:</p> <ul style="list-style-type: none"> • Metal drums, standard waste boxes, ten drum overpacks • Corrugated metal boxes • Bolas Grande Spheres • POCs • Type B Containers
CONDITION	A discrete state of a system or component for which an ACTION is performed within a specified COMPLETION TIME.
DEFINED AREA	All above-ground areas where activities involve Material-at-Risk (MAR). DEFINED AREAS have boundaries that are identified and documented. DEFINED AREAS may also be identified and marked using physical means (e.g., painted line marking the perimeter of an applicable area, rope boundary, etc.) or designated by a fixed structure (e.g., walls of a dome or perimeter of a paved pad). DEFINED AREAS may have independently assigned MODES.
DOUBLEPACK	A TRU WASTE container inside another TRU WASTE container where both containers are of sound integrity.

1.0 USE AND APPLICATION

1.1 DEFINITIONS

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Term	Definition
ENSURE	To confirm, substantiate, and assure that an activity or CONDITION has been implemented in conformance with the specified requirements. Allows for manipulation of equipment or instrumentation to conform with specified requirements. May be done by reliable methods other than direct observation.
EQUIVALENT COMBUSTIBLE WASTE	That quantity of radioactive waste which would provide the same dose to the maximally exposed offsite individual (MEOI) (or collocated worker at 100 meters) as the bounding accident release of one plutonium-239 equivalent curie (PE-Ci) of waste contained in a 100% combustible matrix.
EXPOSED	Not covered with the depth of overburden fill material necessary to be treated as below-ground inventory (when referring to radioactive waste in a pit, trench, or shaft). Not BURIED.
FUEL PACKAGE	Package of TRANSIENT COMBUSTIBLES with weight of greater than or equal to 20 lb.
HANDLE/ HANDLED/ HANDLING	The movement of waste containers within a DEFINED AREA or between two DEFINED AREAS that are collocated within the same building, dome, or pad.
HE-RTR PROCESS AREA	The area including the High Energy Real-Time Radiography vault and within 20 feet of the vault.
HIGH RISK-LOCATION(S)	Any area identified in Area-G where a TRU WASTE STORAGE AREA, TRU RETRIEVAL AREA, SSSR AREA, or TRU PROCESS AREA is perpendicular to a designated vehicle roadway and can potentially be impacted if a vehicle continued traveling in a straight path either from operator error or equipment malfunctions. An area where the designated vehicle roadway would only result in a glancing impact (i.e. not a straight path) is not considered a HIGH RISK LOCATION.
IMMEDIATELY	Term used as COMPLETION TIME for ACTIONS when a step is to be initiated as soon as possibly achievable without creating a less stable CONDITION and continuously and aggressively pursued until complete.
ISOLATION AREA	A safe storage area for a population of UNVENTED TRU WASTE DRUMS that is segregated from NORMAL OPERATIONS, except those operations specific to disposition or inspection of the UNVENTED TRU WASTE DRUMS. A 15-ft exclusion zone exists between the perimeter of the ISOLATION AREA and areas where NORMAL OPERATIONS occur.
LIQUID IMPEDIMENT	A berm, curb, slope, ditch and/or equivalent liquid flow impediment used to limit the spread of a fuel pool fire from liquid fueled equipment or vehicles

1.0 USE AND APPLICATION

1.1 DEFINITIONS

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Term	Definition
	such that the flow of the fuel is either stopped and/or is directed in such a way that it will not impact waste within the DEFINED AREA.
LOW ACTIVITY AREA	DEFINED AREA for storage, characterization, consolidation, and disposal of commingled low-level waste, mixed low-level waste, and TRITIUM-CONTAMINATED WASTE. LOW ACTIVITY AREAS may include areas where radioactive waste is placed below grade or above grade.
MATERIAL AT RISK (MAR)	The amount of radioactive materials (in grams or curies of activity for each radionuclide) available to be acted on by a given physical stress.
METAL CONTAINER	A metal radioactive waste container.
MINOR MOVEMENT	During HANDLING of UNVENTED TRU WASTE DRUM, the movement of a drum to the extent necessary for attachment or removal of a lid restraining device or other blast-mitigation device.
MODE	The status or operating CONDITION of the Facility or a DEFINED AREA used for assigning Applicability of safety controls as specified in Section 1.1 of this document.
NON-ESSENTIAL ACTIVITIES	NON-ESSENTIAL ACTIVITIES are all activities, except the following: <ul style="list-style-type: none"> • ACTIONS to place the Area G site or AFFECTED DEFINED AREA into a SAFE CONFIGURATION. • Maintenance, surveillance, and associated activities necessary to maintain the authorization basis (e.g., TSR Surveillances, permit-driven inspections, etc.).
NORMAL OPERATIONS	Day-to-day or routine operations involving MAR using equipment and material familiar to the operations of the AREA G facility including but not limited to surveillance, hazard reduction activities, material and waste management activities, maintenance, and support services.
OPERABLE/ OPERABILITY	A system, subsystem, train, component, or device SHALL be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication, or other auxiliary equipment that is required for the system, subsystem, train, component, or device to perform its safety function(s) are also capable of performing their related support function(s).

1.0 USE AND APPLICATION

1.1 DEFINITIONS

NOTE: *The terms defined in this section appear in capitalized type and are applicable throughout this TSR document. When a term defined in this section is not capitalized, it is being used in its common English sense and not as defined in this section.*

Term	Definition
OVERPACK	A TRU WASTE container inside another, larger passively vented METAL CONTAINER, to provide an additional barrier between the radioactive waste and the environment.
PROCESS AREA	A DEFINED AREA for performing closed TRU WASTE container activities.
RETRIEVAL AREA	DEFINED AREA for the retrieval of TRU WASTE containers from Pit 9 and/or Trenches A through D.
SAFE CONFIGURATION	The minimization of potential accident initiators in on-going processes by limiting the use of equipment and energy sources to those necessary for facility safety.
SHALL	Denotes a requirement.
SSSR AREA	DEFINED AREA where sort, segregate and size reduction (SSSR) activities occur, e.g., opening of TRU WASTE containers to remove waste and subsequent removal, remediation, and repackaging of waste.
STATIONARY FIRE WATCH	A person stationed at a specific location with no other assigned duties for the purpose of making fire safety observations, notifying building occupants and the fire department of an emergency, preventing a fire from occurring, and/or extinguishing small fires as trained.
STORAGE AREA	A DEFINED AREA where confined TRU WASTE is stored.
TRANSIENT COMBUSTIBLE	Ordinary combustible material (e.g., cardboard trash boxes, plastic bags, cardboard/wooden shipping cartons) that are not permanent fixtures of the facility, not including low-level or mixed low-level waste containers or TRU WASTE containers or the radioactive waste within those containers, flammable/combustible liquids, materials used to package and ship radioactive waste from Area G, and contamination control materials required for radiation protection.
TRANSPORT/ TRANSPORTED/ TRANSPORTING	The forklift or vehicle movement of waste containers outside of a DEFINED AREA, or beyond the confines of a building, dome, or pad which contains two or more DEFINED AREAS.
TRITIUM AREA	DEFINED AREA identified for the storage of non-TRU tritium containers that do not qualify for placement in a LOW ACTIVITY AREA.
TRITIUM-CONTAMINATED WASTE	Tritium-contaminated waste with a concentration limit of 8.6E+01 Ci/m ³ .

1.0 USE AND APPLICATION

1.1 DEFINITIONS

NOTE: *The terms defined in this section appear in capitalized type and are applicable throughout this TSR document. When a term defined in this section is not capitalized, it is being used in its common English sense and not as defined in this section.*

Term	Definition
TRITIUM WASTE	Tritium waste (free tritium gas, tritiated water in molecular sieves, etc.) and tritium-contaminated waste exceeding a concentration limit of 8.6E+01 Ci/m ³ .
TRANSPORTATION VEHICLE	Vehicle used for the TRANSPORT of TRU WASTE containers, TRITIUM WASTE containers, low-level waste, mixed low-level waste, or TRITIUM-CONTAMINATED WASTE containers.
TRU WASTE	Waste containing alpha-emitting transuranic radionuclides (atomic numbers greater than 92) and half-lives that exceed 20 yr at concentrations greater than 100 nCi/g.
UNVENTED TRU WASTE DRUM	<p>A 30-gal, 55-gal, 85-gal, or 110-gal TRU WASTE drum that does not have a vent. A drum with a visibly obstructed vent is an UNVENTED TRU WASTE DRUM. Note: the filter on the vent is not considered an obstruction.</p> <p>TRU WASTE drums with a hydrogen concentration $\geq 8\%$ (or $\geq 8,000$ ppm VOCs, are considered UNVENTED TRU WASTE DRUMS.</p>
VENTED TRU WASTE DRUM	<p>A 30-gal, 55-gal, 85-gal, or 110-gal TRU WASTE drum that has a vent free of obstruction. A vented 30-gal, 55-gal, 85-gal, or 110-gal TRU WASTE drum that contains an unvented inner drum is considered a VENTED DRUM. An OVERPACK that contains an UNVENTED TRU WASTE DRUM is considered a VENTED TRU WASTE DRUM. Note: the filter on the vent is not considered an obstruction.</p> <p>An UNVENTED DRUM becomes a VENTED DRUM after it is vented and contains $< 8\%$ hydrogen concentration and < 8000 ppm for VOCs.</p>
VERIFY	<p>Confirm and substantiate that an activity or CONDITION has been implemented in conformance with the specified requirements.</p> <p>Manipulation of equipment or instrumentation to conform to the specified requirement is not permitted.</p> <p>Methods other than direct observation may be used.</p>

1.0 USE AND APPLICATION

1.1-1 USE OF MODES

The MODES defined in this section and shown in Table 1.1-1 appear in capitalized type and are applicable throughout this TSR document.

Table 1.1-1 USE OF MODES

MODE	DESCRIPTION
OPERATION	In OPERATION MODE, all activities involving LLW, MLLW, HW, TRITIUM WASTE, TRITIUM-CONTAMINATED WASTE or TRU WASTE, are allowed within the DEFINED AREA.
WARM STANDBY	In WARM STANDBY MODE, the MAR within the DEFINED AREA SHALL be in a SAFE CONFIGURATION, except for surface contamination and sources used for equipment calibration, and facility generated radioactive waste.
COLD STANDBY	In COLD STANDBY MODE, the above-ground MAR has been removed from the applicable DEFINED AREA, except for surface contamination and sources used for equipment calibration.

1.0 USE AND APPLICATION

1.2 LOGICAL CONNECTORS

PURPOSE	The purpose of this section is to explain the use and application of logical connectors.						
BACKGROUND	Logical connectors are used in TSRs to discriminate between (and yet connect) discrete CONDITIONS, ACTIONS, COMPLETION TIMES, SRs, and FREQUENCIES. The only logical connectors that appear in this TSR document are “ <u>AND</u> ” or “ <u>OR</u> .” The physical arrangement of these connectors on a page constitutes a specific meaning in accordance with the convention established in DOE G 423.1-1.						
USE OF LOGICAL CONNECTORS	<p>Several levels of logic may be used to state ACTIONS. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each ACTION. The first level of logic is identified by the first digit of the number assigned to an ACTION and the placement of the logical connector in the first level of nesting (for example, left-justified with the number of the ACTION). The successive levels of logic are identified by additional digits of the ACTION number and by successive indenting of the logical connectors.</p> <p>When logical connectors are used to state a CONDITION, usually only the first level of logic is used and the logical connector is left justified with the CONDITION statement. In a few cases, successive levels of logic are used. Because CONDITION statement subparts are not numbered separately, the lower level is identified solely by indenting the logical connector.</p> <p>When logical connectors are used to state a COMPLETION TIME, SRs, or FREQUENCY, only the first level of logic is used; the logical connector is left justified with the statement of the COMPLETION TIME, SR, or FREQUENCY.</p>						
DEFINITION OF LOGIC TERMS	<p>The defined terms of this section appear in <i>capitalized type</i>, <i>bolded</i>, and <i>underlined</i> throughout the TSR document.</p> <table border="0"> <thead> <tr> <th data-bbox="505 1360 581 1388"><u>Term</u></th> <th data-bbox="602 1360 727 1388"><u>Definition</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="505 1402 581 1430"><u>AND</u></td> <td data-bbox="597 1402 1453 1465">Used to connect two or more sets of criteria that must all be satisfied for a given logical decision.</td> </tr> <tr> <td data-bbox="505 1480 581 1507"><u>OR</u></td> <td data-bbox="597 1480 1453 1543">Used to denote alternate combinations or CONDITIONS, meaning either one or the other criterion will satisfy a given logical decision.</td> </tr> </tbody> </table>	<u>Term</u>	<u>Definition</u>	<u>AND</u>	Used to connect two or more sets of criteria that must all be satisfied for a given logical decision.	<u>OR</u>	Used to denote alternate combinations or CONDITIONS, meaning either one or the other criterion will satisfy a given logical decision.
<u>Term</u>	<u>Definition</u>						
<u>AND</u>	Used to connect two or more sets of criteria that must all be satisfied for a given logical decision.						
<u>OR</u>	Used to denote alternate combinations or CONDITIONS, meaning either one or the other criterion will satisfy a given logical decision.						
APPLICATION	See Example 1.2-1 on the following page for an example of the application of logical connectors used in this TSR document.						

1.0 USE AND APPLICATION

1.2 LOGICAL CONNECTORS

Example 1.2-1. Use and Application of Logical Connectors

CONDITION	ACTION	COMPLETION TIME
Situation that does not meet LCO statement	A.1 Terminate A	IMMEDIATELY
	<u>AND</u>	
	A.2 Perform BC	1 hour
	<u>AND</u>	
	A.3.1 Restore V	1 hour
	<u>OR</u>	
	A.3.2.1 Initiate S	1 hour
	<u>AND</u>	
	A.3.2.2 Place the facility in MODE S	4 hours

The logic shown in the above tabular presentation allows only two approved outcomes upon occurrence of the specified situation that does not meet the LCO:

- (1) A.1 (Terminate A), and A.2 (Perform BC), and A.3.1 (Restore V), or
- (2) A.1 (Terminate A), and A.2 (Perform BC), and A.3.2.1 (Initiate S), and A.3.2.2 (Place the facility in MODE S).

1.0 USE AND APPLICATION

1.3 COMPLETION TIMES

PURPOSE	The purpose of this section is to establish the COMPLETION TIME convention and provide guidance for its use.
BACKGROUND	LCOs specify the minimum requirements for ensuring safe operation of the facility. The ACTIONS associated with a LCO state the CONDITIONS required to meet the LCO. Specified with each stated CONDITION are required ACTION(s) and COMPLETION TIME(s).
COMPLETION TIME	<p>The COMPLETION TIME is the amount of time allowed to complete an ACTION. It is referenced to the time a situation (e.g., inoperable equipment or variable not within limits) is discovered that requires entering a CONDITION, providing the facility is in a MODE or specified CONDITION stated in the Applicability portion of the LCO. ACTIONS SHALL be completed before the specified COMPLETION TIME expires. A CONDITION remains in effect until the CONDITION no longer exists or the facility is not within the LCO Applicability.</p> <p>Time of Declaration is the actual time when the Shift Operations Manager (SOM)/Shift Operations Supervisor (SOS) determines that an LCO or SR is not met. As soon as possible upon notification of a problem, the problem should be evaluated and a declaration made by the SOM/SOS if it is determined that an LCO is not met. Time specified for completion of a ACTION is measured from the Time of Declaration unless otherwise specified within the ACTION.</p> <p>If situations are discovered that require entry into more than one CONDITION within a single LCO (multiple CONDITIONS), the ACTIONS for each CONDITION SHALL be performed within the associated COMPLETION TIME. When in multiple CONDITIONS, separate COMPLETION TIMES are tracked for each CONDITION, starting from the Time of Declaration of the situation that required entry into the CONDITION.</p> <p>Once a CONDITION has been entered, subsequent trains, subsystems, components, or variables expressed in the CONDITION discovered to be inoperable or not within limits SHALL result in separate entry into the CONDITION and separate tracking of COMPLETION TIME for each discovery. The ACTIONS and the associated COMPLETION TIMES of the CONDITION then apply to each additional discovery.</p>
APPLICATION	The following examples, 1.3-1 through 1.3-7, illustrate the use of COMPLETION TIMES with different types on CONDITIONS and changing CONDITIONS.

1.0 USE AND APPLICATION

1.3 COMPLETION TIMES

Example 1.3-1

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
B. ACTION and associated COMPLETION TIME not met.	B.1 Be in MODE 3.	1 hr
	<u>AND</u> B.2 Be in MODE 4.	3 days

CONDITION B has two ACTIONS. Each ACTION has its own separate COMPLETION TIME. Each COMPLETION TIME is referenced to the time that CONDITION B is entered.

The ACTIONS of CONDITION B are to be in MODE 3 in 1 hr AND in MODE 4 in 3 days. A total of 1 hr is allowed to reach MODE 3, and a total of 3 days (not 3 days plus 1 hr) is allowed to reach MODE 4 from the time that CONDITION B was entered. If MODE 3 is reached in 30 min, the time allowed to reach MODE 4 is the next 71 hr and 30 min, because the total time allowed to reach MODE 4 is 3 days.

If CONDITION B is entered while in MODE 3, the time allowed to reach MODE 4 is the next 3 days.

1.0 USE AND APPLICATION

1.3 COMPLETION TIMES

Example 1.3-2

ACTIONS:

CONDITION		ACTION		COMPLETION TIME
A.	One pump is not OPERABLE.	A.1	Restore pump to OPERABLE status.	7 days
B.	ACTION and associated COMPLETION TIME of CONDITION A not met.	B.1	Be in MODE 3.	1 hr
		B.2	Be in MODE 4.	3 days

When a pump is declared inoperable, CONDITION A is entered. If the pump is not restored to OPERABLE status within 7 days, CONDITION B is entered and the COMPLETION TIME clocks for ACTIONS B.1 and B.2 start. If the inoperable pump is restored to OPERABLE status after CONDITION B is entered, the ACTIONS of CONDITION B may be terminated.

When a second pump is declared inoperable while the first pump is still inoperable, CONDITION A is not re-entered for the second pump. LCO 3.0.3 is entered, because the ACTIONS do not include a CONDITION for more than one inoperable pump. The COMPLETION TIME for CONDITION A does not stop after LCO 3.0.3 is entered, but continues to be tracked from the time CONDITION A was initially entered.

While in LCO 3.0.3, if one of the inoperable pumps is restored to OPERABLE status and the COMPLETION TIME for CONDITION A has not expired, LCO 3.0.3 may be exited and operation continued in accordance with CONDITION A.

While in LCO 3.0.3, if one of the inoperable pumps is restored to OPERABLE status and the COMPLETION TIME for CONDITION A has expired but the COMPLETION TIME for CONDITION B has not expired, LCO 3.0.3 may be exited and operation continued as specified in CONDITION B. The COMPLETION TIME for CONDITION B is tracked from the time the CONDITION A COMPLETION TIME expired.

After one of the pumps is restored to OPERABLE status, the CONDITION A COMPLETION TIME is not reset, but continues from the time the first pump was declared not OPERABLE. This COMPLETION TIME may be extended if the restored pump was the first inoperable pump. A 24-hr extension to the 7 days is allowed, provided this does not result in the second pump being inoperable for >7 days (which could occur only if the second pump became inoperable <24 hr after the first pump).

1.0 USE AND APPLICATION

1.3 COMPLETION TIMES

Example 1.3-3

ACTIONS:

CONDITION		ACTION		COMPLETION TIME
A.	One Function X train is not OPERABLE.	A.1	Restore Function X train to OPERABLE status.	7 days
B.	One Function Y train is not OPERABLE.	B.1	Restore Function Y train to OPERABLE status.	7 days
C.	One Function X train is not OPERABLE.	C.1	Restore Function X train to OPERABLE status.	72 hr
	AND One Function Y train is not OPERABLE.	OR C.2	Restore Function Y train to OPERABLE status.	72 hr

When one Function X train and one Function Y train are not OPERABLE, CONDITION A and CONDITION B are concurrently applicable. The COMPLETION TIMES for CONDITION A and CONDITION B are tracked separately for each train starting from the time each train was declared not OPERABLE and the CONDITION was entered. A separate COMPLETION TIME is established for CONDITION C tracked from the time the second train was declared not OPERABLE (i.e., the time the situation described in CONDITION C was discovered).

If the ACTION C.2 is completed within the specified COMPLETION TIME, CONDITIONS B and C are exited. If the COMPLETION TIME for ACTION A.1 has not expired, operation may continue as specified by CONDITION A. The remaining COMPLETION TIME in CONDITION A is measured from the time the AFFECTED train was declared not OPERABLE (i.e., initial entry into CONDITION A).

1.0 USE AND APPLICATION

1.3 COMPLETION TIMES

Example 1.3-4

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. One or more valves not OPERABLE.	A.1 Restore valves to OPERABLE status.	4 hr
B. ACTION and associated COMPLETION TIME of CONDITION A not met.	B.1 Be in MODE 3.	1 hr
	AND B.2 Be in MODE 4.	3 days

A single COMPLETION TIME is used for any number of valves not OPERABLE at the same time. The COMPLETION TIME associated with CONDITION A is based on the initial entry into CONDITION A and is not tracked on a per-valve basis. Subsequent valves declared not OPERABLE, while CONDITION A is still in effect, do not require that unique COMPLETION TIMES be tracked.

After one of the valves is restored to OPERABLE status, the CONDITION A COMPLETION TIME is not reset, but continues from the time the first valve was declared not OPERABLE. The COMPLETION TIME may be extended if the restored valve was the first inoperable valve. The CONDITION A COMPLETION TIME may be extended for up to 4 hr, provided this does not result in any subsequent valve being inoperable for > 4 hr.

If the COMPLETION TIME of 4 hr (including any extensions) expires while one or more valves are still inoperable, CONDITION B is entered.

1.0 USE AND APPLICATION

1.3 COMPLETION TIMES

EXAMPLE 1.3-5

-----NOTE-----

Separate CONDITION entry is allowed for each INOPERABLE valve.

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. One or more valves not OPERABLE.	A.1 Restore valves to OPERABLE status.	4 hr
B. ACTION and associated COMPLETION TIME of CONDITION A not met.	B.1 Be in MODE 3.	12 hr
	<u>AND</u> B.2 Be in MODE 4.	36 hr

An exception note is included above in the ACTIONS Table to modify how the COMPLETION TIME is tracked. If this method is only applicable to CONDITION A, the note may appear in the CONDITION column.

In this example, the note allows CONDITION A to be entered separately for each inoperable valve and COMPLETION TIMES tracked on a per-valve basis. When a valve is declared inoperable, CONDITION A is entered and its COMPLETION TIME starts. If subsequent valves are declared inoperable, CONDITION A is entered for each valve and separate COMPLETION TIMES start and are tracked for each valve.

If the COMPLETION TIME associated with a valve in CONDITION A expires, CONDITION B is entered for that valve. If the COMPLETION TIMES associated with subsequent valves in CONDITION A expire, CONDITION B is entered separately for each valve and separate COMPLETION TIMES start and are tracked for each valve. If a valve that caused entry into CONDITION B is restored to OPERABLE status, CONDITION B is exited for that valve.

Because this example contains a note allowing multiple entries and tracking separate COMPLETION TIMES, COMPLETION TIME extensions do not apply.

1.0 USE AND APPLICATION

1.3 COMPLETION TIMES

Example 1.3-6

ACTIONS:

CONDITION		ACTION		COMPLETION TIME
A.	One channel is not OPERABLE.	A.1	Perform SR 4.x.x.x.	Once per 8 hr
		OR A.2	Reduce temperature to < 50% of the allowed rated temperature.	8 hr
B.	ACTION and associated COMPLETION TIME of CONDITION A not met.	B.1	Be in MODE 3.	1 hr

Entry into CONDITION A offers a choice between ACTIONS A.1 or A.2. ACTION A.1 has a “once per” type COMPLETION TIME that qualifies for the 25% extension of SR 4.0.2 to each performance after the initial performance. If ACTION A.1 is followed and the ACTION is not met within the COMPLETION TIME (including 25% extension of SR 4.0.2), CONDITION B is entered. If ACTION A.2 is followed and COMPLETION TIME of 8 hr is not met, CONDITION B is entered.

If, after entry into CONDITION B, ACTION A.1 or A.2 is met, CONDITION B is exited and operation may then continue in CONDITION A.

1.0 USE AND APPLICATION

1.3 COMPLETION TIMES

Example 1.3-7

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. One subsystem is not OPERABLE.	A.1 VERIFY that AFFECTED subsystem is isolated.	1 hr
	<u>AND</u> A.2 Restore subsystem to OPERABLE status.	<u>AND</u> Once per 8 hr thereafter 72 hr
B. ACTION and associated COMPLETION TIME of CONDITION A not met.	B.1 Be in MODE 3.	1 hr
	<u>AND</u> B.2 Be in MODE 4.	3 days

ACTION A.1 has two COMPLETION TIMES. The 1 hr COMPLETION TIME begins at the time the CONDITION is entered and each “Once per 8 hr thereafter” interval begin on performance of ACTION A.1.

If, after CONDITION A is entered, ACTION A.1 is not met within either the initial 1 hr or within any subsequent 8 hr interval from the previous performance, CONDITION B is entered. The COMPLETION TIME clock for CONDITION A does not stop after CONDITION B is entered, but continues to be tracked from the time CONDITION A was initially entered.

If after CONDITION B is entered, ACTION A.1 is met, CONDITION B is exited and operation may continue in accordance with CONDITION A, provided the COMPLETION TIME for ACTION A.2 has not expired.

1.0 USE AND APPLICATION

1.4 FREQUENCY

PURPOSE	The purpose of this section is to explain the application and use of FREQUENCY and periodicity notation.
BACKGROUND	Each SR has a specified FREQUENCY in which the SR SHALL be performed. The FREQUENCY notation used in this TSR document is in agreement with Table 1.4-1.
FREQUENCY NOTATION	The FREQUENCY notations used in this TSR document are defined in Table 1.4-1.
USE OF FREQUENCY/ PERIODICITY	To prevent a possible violation, the SR must be completed within the stated FREQUENCY. For SRs, the FREQUENCY requirement may be extended to 1.25 times the specified interval based on generic SR 4.0.2. This extension applies to the FREQUENCY specification for SRs and can also apply to a periodicity requirement for ACTION statements following the initial performance. The time extension is intended to provide operational flexibility for completion of SRs. It SHALL not be relied upon as a routine extension of the specified interval.

Table 1.4-1 FREQUENCY Notation

Notation	FREQUENCY (or alternative Notation)	FREQUENCY + 25% ⁽¹⁾
Shiftly	Once per working shift	N/A
Daily	24 hr	30 hr
Weekly	7 days	8 days
Monthly	31 days	38 days
Quarterly	92 days	115 days
Semiannually	184 days	230 days
Annually	365 days	456 days

⁽¹⁾ It is expected that all SRs will be performed within their Frequencies. This column represents the 25% extension allowed by SR 4.0.2.

2.0 SAFETY LIMITS

SECTION 2.0 SAFETY LIMITS

2.0 SAFETY LIMITS

There are no Safety Limits (SLs) specified for the TA-54, Area G site.

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

SECTION 3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.0 LIMITING CONDITIONS FOR OPERATION

LCO 3.0.1	LCOs SHALL be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2.
LCO 3.0.2	Upon discovery of a failure to meet an LCO, the associated ACTIONS SHALL be met. If the LCO is restored before the specified COMPLETION TIME expires, completion of the ACTION is not required, unless otherwise stated.
LCO 3.0.3	<p>When an LCO statement is not met, and the associated ACTION(S) are not met, or when an associated ACTION is not provided, the AFFECTED DEFINED AREA SHALL be placed in a MODE or other specified condition in which the LCO is not applicable. If the LCO is applicable in all MODES, the AFFECTED DEFINED AREA SHALL be placed in COLD STANDBY. Activities SHALL be initiated within 1 hr and continuously and aggressively pursued until complete.</p> <p>Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the ACTIONS required by LCO 3.0.3 are not required.</p> <p>LCO 3.0.3 is applicable in all MODES except COLD STANDBY. Exceptions to LCO 3.0.3 may be stated in the individual LCOs.</p>
LCO 3.0.4	<p>When an LCO is not met, a MODE or other specified condition in the Applicability SHALL not be entered, except when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. LCO 3.0.4 SHALL not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS.</p> <p>Exceptions to LCO 3.0.4 are generally stated in the individual LCOs. When an individual LCO states that LCO 3.0.4 does not apply, it allows entry into MODES or other specified conditions in the Applicability when the associated ACTIONS to be entered permit operation in the MODE or other specified condition for only a limited time. An additional exception to LCO 3.0.4 is allowed for individual LCOs related to activities that contribute to the safety of the situation at Area G for outstanding Potentially Inadequate Safety Analysis (PISA) conditions and identified non-compliant RCRA waste containers. The specific activities are identified in the Appendix A Bases.</p>
LCO 3.0.5	Equipment removed from service or declared inoperable to comply with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate its OPERABILITY or the OPERABILITY of other equipment. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.
LCO 3.0.6	When a support system is declared inoperable, the supported systems are also required to be declared inoperable. However, only the support system's ACTIONS are required to be entered, provided they reflect the supported system's degraded safety condition. This is a clarification of the definition of OPERABILITY.

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

4.0 SURVEILLANCE REQUIREMENTS

- 4.0.1 SRs SHALL be met during the MODES or other specified conditions in the Applicability for individual LCOs unless otherwise stated in an individual SR. Failure to meet a surveillance (whether such failure is experienced during the performance of the surveillance or between performances of the surveillance) SHALL constitute failure to meet the LCO. Failure to perform a surveillance within the specified FREQUENCY SHALL constitute failure to meet the LCO, except as provided in SR 4.0.3. Surveillances do not have to be performed on inoperable equipment or variables outside specified limits.
-
- 4.0.2 The specified FREQUENCY for each SR is met if the surveillance is performed within 1.25 times the interval specified in the FREQUENCY, as measured from the previous performance or as measured from the time a specified condition of the FREQUENCY is met.
- For FREQUENCIES specified as “once,” the above interval extension does not apply.
- If a COMPLETION TIME requires periodic performance of “once per . . . ,” the above FREQUENCY extension applies to each performance after the initial performance.
- Exceptions to SR 4.0.2 are stated in the individual SRs.
-
- 4.0.3 If it is discovered that a surveillance was not performed within its specified FREQUENCY, compliance with the requirement to declare the LCO not met may be delayed from the time of declaration up to 24 hr or up to the limit of the specified FREQUENCY, whichever is less. This delay period is permitted to allow performance of the surveillance. If the surveillance is performed within the delay period and the surveillance is met, the LCO may be declared to be met; however, this does not preclude notification of a violation of SR 4.0.2.
- If the surveillance is not performed within the delay period, the LCO SHALL IMMEDIATELY be declared **not** met, and the applicable ACTIONS SHALL be entered. The COMPLETION TIMES of the ACTIONS begin IMMEDIATELY upon expiration of the delay period. When the surveillance is performed within the delay period and the surveillance is not met, the LCO SHALL IMMEDIATELY be declared not met, and the Applicable ACTIONS SHALL be entered. The COMPLETION TIMES for the ACTIONS begin IMMEDIATELY upon failure to meet the surveillance.
-
- 4.0.4 Entry into a MODE or other specified condition in the Applicability of an LCO SHALL **not** be made unless the LCO’s surveillances have been met within their specified FREQUENCY. This provision SHALL **not** prevent passage through or to MODES or other specified conditions in compliance with ACTIONS.
-

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

3.1.1 SORT, SEGREGATE, SIZE REDUCTION, AND REPACKAGING (SSSR) AREA PROCESS CONTROLS

LCO: MAR in each SSSR AREA SHALL be limited as follows:

1. ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE, in process,
AND
2. ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE, staged in closed container(s)

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: SSSR AREA

----- NOTE -----
 Separate CONDITION entry is allowed for each SSSR AREA.

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. The MAR inventory in an AFFECTED SSSR AREA > 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE in process, or > 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE staged in closed container(s), awaiting processing or removal.	A.1 Stop MAR inventory additions in the AFFECTED SSSR AREA.	IMMEDIATELY
	<u>AND</u>	
	A.2.1 Restore MAR inventory in the AFFECTED SSSR AREA to ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE in process, and ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE staged in closed container(s), awaiting processing or removal.	IMMEDIATELY
	<u>OR</u>	
	A.2.2 Establish a STATIONARY FIRE WATCH at the AFFECTED SSSR AREA.	2 hr
	<u>AND</u>	
	A.2.3 Restore MAR inventory in the AFFECTED SSSR AREA to ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE in process, and ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE staged in closed container(s), awaiting processing or removal.	7 days

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

CONDITION	ACTION	COMPLETION TIME
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4.1.1 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.1.1.1	VERIFY that in process MAR in each SSSR AREA is \leq 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE.	Prior to opening of TRU WASTE container(s) in each SSSR AREA.
SR 4.1.1.2	VERIFY that staged MAR in each SSSR AREA is \leq 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE.	Prior to introducing TRU WASTE container(s) in each SSSR AREA.

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

3.1.2 LOW ACTIVITY AREA (LAA)

LCO: LAA MAR SHALL be limited as follows:

1. The total EXPOSED TRITIUM-CONTAMINATED WASTE at Area G is $\leq 3,000$ tritium Ci
2. The total LAA EXPOSED MAR at Area G is ≤ 100 PE-Ci
3. BURIED waste within an LAA SHALL be covered with ≥ 3 inches of overburden fill material (dirt or equivalent barrier).

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: LAAs

----- NOTE -----
For LCO 3.1.2.3, a separate CONDITION entry is allowed for each AFFECTED LAA.

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. The total EXPOSED TRITIUM-CONTAMINATED WASTE MAR inventory at Area G is $> 3,000$ tritium Ci.	A.1 Stop MAR inventory additions to all LAAs	IMMEDIATELY
	AND A.2 Place all LAAs in WARM STANDBY	2 hr
	AND A.3 Restore total EXPOSED TRITIUM-CONTAMINATED WASTE MAR inventory to within limits.	7 days
B. The total LAA EXPOSED MAR at Area G > 100 PE-Ci.	B.1 Stop MAR inventory additions to all LAAs.	IMMEDIATELY
	AND B.2 Place all LAAs in WARM STANDBY.	IMMEDIATELY
	AND B.3 Reduce total Area G EXPOSED LAA MAR inventory to ≤ 100 PE-Ci.	7 days
C. BURIED radioactive waste inventory in an LAA has become EXPOSED (has less than 3 inches of overburden fill material, or equivalent).	C.1 Stop all disposal of radioactive waste in the affected LAA.	IMMEDIATELY
	AND C.2.1 Perform SR 4.1.2.2 to determine if the EXPOSED waste inventory is less than or equal to the respective MAR limit	3 days
	OR C.2.2 Restore the overburden fill material depth to ≥ 3 inches of overburden over radioactive waste in the affected LAA	3 days

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

CONDITION	ACTION	COMPLETION TIME
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4.1.2 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.1.2.1	VERIFY that the total EXPOSED TRITIUM-CONTAMINATED WASTE MAR inventory at Area G is $\leq 3,000$ tritium Ci.	Quarterly
SR 4.1.2.2	VERIFY the total EXPOSED LAA MAR at Area G is ≤ 100 PE-Ci.	Quarterly
SR 4.1.2.3	VERIFY the MAR in an LAA is covered with ≥ 3 inches of overburden fill material, or equivalent	Prior to declaring radioactive waste in an LAA BURIED
SR 4.1.2.4	Inspect overburden on BURIED radioactive waste within LAAs for signs of significant erosion, subsidence, or other signs of loss of cover.	Monthly

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

3.1.3 TRANSPORTATION VEHICLE Limits

LCO: The quantity of MAR present on an individual TRANSPORTATION VEHICLE SHALL be limited as follows:

1. For TRU WASTE:
 - ≤ 1100 PE-Ci with only COMPLIANT METAL CONTAINERS,
 - OR**
 - ≤ 615 PE-Ci with one or more non-COMPLIANT or non-METAL containers
 - OR**
2. For low-level waste, or mixed low-level waste, or TRITIUM-CONTAMINATED WASTE:
 - ≤ 35 PE-Ci,
 - AND**
 - ≤ 3,000 tritium Ci.
 - OR**
3. For TRITIUM WASTE:
 - ≤ 1,000,000 tritium Ci.

MODE APPLICABILITY: At all times

AREA APPLICABILITY: Within Area G and along Mesita del Buey Road

----- NOTE -----

A separate CONDITION entry is allowed for each AFFECTED TRANSPORTATION VEHICLE

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. MAR content on a TRANSPORTATION VEHICLE exceeds LCO requirements	A.1 Stop movement and loading of the AFFECTED TRANSPORTATION VEHICLE <u>AND</u> A.2 Reduce MAR inventory on AFFECTED TRANSPORTATION VEHICLE within LCO limits.	IMMEDIATELY 24 hr

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

4.1.3 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.1.3.1	VERIFY the MAR inventory on a TRANSPORTATION VEHICLE with only COMPLIANT METAL CONTAINERS is $\leq 1,100$ PE-Ci TRU WASTE	Prior to movement of a TRANSPORTATION VEHICLE loaded with TRU WASTE
SR 4.1.3.2	VERIFY the MAR inventory on a TRANSPORTATION VEHICLE with one or more non-COMPLIANT or non-METAL CONTAINERS is ≤ 615 PE-Ci TRU WASTE	Prior to movement of a TRANSPORTATION VEHICLE loaded with TRU WASTE
SR 4.1.3.3	VERIFY the MAR inventory on a TRANSPORTATION VEHICLE is ≤ 35 PE-Ci low-level waste, or mixed low-level waste AND $\leq 3,000$ tritium Ci	Prior to movement of a TRANSPORTATION VEHICLE loaded with LLW, MLLW, and/or TRITIUM-CONTAMINATED WASTE
SR 4.1.3.4	VERIFY the total MAR inventory on a TRANSPORTATION VEHICLE is $\leq 1,000,000$ tritium Ci.	Prior to movement of a TRANSPORTATION VEHICLE loaded with TRITIUM WASTE

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

3.1.4 STORAGE AREA, TRITIUM AREA, and PROCESS AREA MAR

LCO: MAR SHALL be limited:

1. Total TRU WASTE in DEFINED AREAS within BUILDING 54-412: ≤ 56 PE-Ci EQUIVALENT COMBUSTIBLE WASTE
2. TRU WASTE in PROCESS AREAS:
 - a. HE-RTR: $\leq 1,100$ PE-Ci
 - b. Other individual PROCESS AREAS (e.g., Mobile loading, Drum Venting): $\leq 1,100$ PE-Ci each
 - c. Pad 10 PROCESS AREA (HENCs, Super HENC, RTR, TEUs, and other waste characterization/assay processes located on Pad 10): $\leq 4,000$ PE-Ci total
3. TRU WASTE in a STORAGE AREA with one or more non-COMPLIANT metal or non-METAL CONTAINERS: $\leq 2,000$ PE-Ci
4. TRU WASTE in a STORAGE AREA with only COMPLIANT METAL CONTAINERS: $\leq 22,000$ PE-Ci
5. TRITIUM WASTE in a TRITIUM AREA: $\leq 1,000,000$ tritium Ci
6. TRU WASTE SHALL not be stored in a Building or Dome containing a SSSR AREA (except as allowed by Note 3 below)

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: DEFINED AREAs as stated in LCO.

----- NOTES -----

1. A STORAGE AREA or PROCESS AREA may contain intermingled low-level or mixed waste containers within the area, in addition to TRU WASTE containers. The MAR limit applies to all radioactive waste within the area, except facility-generated job waste that has not yet been characterized as low-level waste.
 2. A separate CONDITION entry is allowed for each AFFECTED DEFINED AREA.
 3. The storage of TRU WASTE up to the SSSR AREA MAR limit as defined in LCO 3.1.1 is allowed for TRU WASTE staged in closed container(s) awaiting process or removal of packaged waste.
-

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

3.1.4 STORAGE AREA, TRITIUM AREA, and PROCESS AREA MAR

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
<p>A. Total TRU WASTE MAR inventory in the DEFINED AREAS within BUILDING 54-412 is > 56 PE-Ci EQUIVALENT COMBUSTIBLE WASTE</p> <p><u>OR</u></p> <p>TRU WASTE MAR in HE-RTR PROCESS AREA > 1,100 PE-Ci</p> <p><u>OR</u></p> <p>TRU WASTE MAR in an other individual PROCESS AREA > 1,100 PE-Ci</p> <p><u>OR</u></p> <p>TRU WASTE MAR in Pad 10 PROCESS AREA > 4,000 PE-Ci</p>	<p>A.1 Stop MAR inventory additions to the AFFECTED DEFINED AREA.</p> <p><u>AND</u></p> <p>A.2 Place AFFECTED DEFINED AREA in WARM STANDBY</p> <p><u>AND</u></p> <p>A.3 Reduce MAR inventory in AFFECTED DEFINED AREA to within LCO limits.</p>	<p>IMMEDIATELY</p> <p>2 hr</p> <p>7 days</p>

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

CONDITION	ACTION	COMPLETION TIME
<p><u>OR</u></p> <p>TRU WASTE MAR in a STORAGE AREA with one or more non-COMPLIANT METAL or non-METAL containers > 2,000 PE-Ci</p> <p><u>OR</u></p> <p>TRU WASTE MAR in a STORAGE AREA with only COMPLIANT METAL CONTAINERS > 22,000 PE-Ci</p> <p><u>OR</u></p> <p>TRITIUM WASTE in a TRITIUM AREA > 1,000,000 tritium Ci.</p>		
<p>B. TRU WASTE is stored in a Building or Dome containing a SSSR AREA (except as allowed by Note 3)</p>	<p>B.1 Stop MAR inventory additions into all DEFINED AREAS within the AFFECTED Building or Dome.</p> <p><u>AND</u></p> <p>B.2 Place all DEFINED AREAS within the AFFECTED Building or Dome in WARM STANDBY.</p> <p><u>AND</u></p> <p>B.3 Remove stored TRU WASTE from the AFFECTED Building or Dome.</p>	<p>IMMEDIATELY</p> <p>IMMEDIATELY</p> <p>7 days</p>

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

4.1.4 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.1.4.1	VERIFY total TRU WASTE inventory in the DEFINED AREAS within BUILDING 54-412 is ≤ 56 PE-Ci EQUIVALENT COMBUSTIBLE WASTE.	Prior to introduction of MAR into a DEFINED AREA within BUILDING 54-412
SR 4.1.4.2	VERIFY TRU WASTE inventory in the HE-RTR AREA is $\leq 1,100$ PE-Ci.	Prior to introduction of MAR into the HE-RTR AREA
SR 4.1.4.3	VERIFY TRU WASTE inventory in each other individual PROCESS AREA is $\leq 1,100$ PE-Ci.	Prior to introduction of MAR into each individual PROCESS AREA
SR 4.1.4.4	VERIFY TRU WASTE inventory in the Pad 10 PROCESS AREA is $\leq 4,000$ PE-Ci.	Prior to introduction of MAR into the Pad 10 PROCESS AREA
SR 4.1.4.5	VERIFY TRU WASTE inventory in a STORAGE AREA with one or more non-COMPLIANT METAL or non-METAL CONTAINERS is $\leq 2,000$ PE-Ci.	Quarterly
SR 4.1.4.6	VERIFY TRU WASTE inventory in each STORAGE AREA with only COMPLIANT METAL CONTAINERS is $\leq 22,000$ PE-Ci.	Quarterly
SR 4.1.4.7	VERIFY the TRITIUM WASTE inventory in each TRITIUM AREA is $\leq 1,000,000$ tritium Ci.	Quarterly
SR 4.1.4.8	VERIFY that TRU WASTE is not stored in a Building or Dome containing a SSSR AREA (except as allowed by Note 3).	Monthly

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

3.1.5 RETRIEVAL AREAS

LCO: EXPOSED MAR in each RETRIEVAL AREA SHALL be \leq 1,500 PE-Ci.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: RETRIEVAL AREA

----- NOTE -----

Separate CONDITION entry is allowed for each RETRIEVAL AREA.

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. EXPOSED MAR inventory in Pit 9 RETRIEVAL AREA > 1,500 PE-Ci.	A.1 Stop the removal of overburden/cover over the waste containers in the AFFECTED RETRIEVAL AREA. <u>AND</u> A.2 Place the AFFECTED RETRIEVAL AREA in WARM STANDBY <u>AND</u> A.3 Reduce EXPOSED MAR inventory at the AFFECTED RETRIEVAL AREA to \leq 1,500 PE-Ci	IMMEDIATELY 2 hr 7 days
B. EXPOSED MAR inventory in Trench A, B, C, and/or D RETRIEVAL AREA >1,500 PE-Ci.	B.1 Stop the removal of cask lids in the AFFECTED RETRIEVAL AREA <u>AND</u> B.2 Place AFFECTED RETRIEVAL AREA in WARM STANDBY <u>AND</u> B.3 Reduce EXPOSED MAR inventory at the AFFECTED RETRIEVAL AREA to within limits.	IMMEDIATELY 2 hr 72 hr

4.1.5 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.1.5.1	VERIFY the planned retrieval in a RETRIEVAL AREA will only expose \leq 1,500 PE-Ci.	Prior to exposing MAR in the individual RETRIEVAL AREA

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

3.1.6 Area G Site Above-Ground MAR Limits

LCO:

1. The total above-ground TRU MAR inventory SHALL be $\leq 57,000$ PE-Ci.

AND

2. The total above-ground MAR inventory of TRITIUM WASTE SHALL be $\leq 4,000,000$ tritium Ci.

AND

3. All above-ground MAR SHALL be located inside a DEFINED AREA appropriate to the waste and container type.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: Area G above-ground

----- NOTES -----

The LCO 3.1.6.3 location requirement does not apply to MAR in TRANSPORT or MAR inside certified Type B containers.

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. Total above-ground TRU MAR inventory > 57,000 PE-Ci	A.1 Stop radiological inventory additions to the above-ground TRU MAR inventory <u>AND</u> A.2 Reduce above-ground TRU MAR inventory to ≤ 57,000 PE-Ci	IMMEDIATELY 31 days
B. Total above-ground tritium waste MAR inventory > 4,000,000 tritium Ci	B.1 Stop tritium inventory additions to the above-ground TRITIUM WASTE MAR inventory <u>AND</u> B.2 Place all areas with TRITIUM WASTE in WARM STANDBY <u>AND</u> B.3 Reduce above-ground TRITIUM WASTE MAR inventory to ≤ 4,000,000 tritium Ci	IMMEDIATELY 2 hours 7 days
C. Calculated product of the actual above-ground TRU WASTE inventory and the waste matrix composition results in a composite source term ¹ > 1.06 PE-Ci. ¹	C.1 Stop TRU WASTE additions to the above-ground MAR inventory. <u>AND</u> C.2 Reduce above-ground TRU WASTE inventory and/or waste matrix composition until the calculated product of the actual above-ground TRU WASTE inventory and the actual waste matrix composition results in a composite source term ¹ ≤ 1.06 PE-Ci.	IMMEDIATELY IMMEDIATELY
D. Above-ground MAR is not located inside a DEFINED AREA appropriate to the waste and container type.	D.1 Stop NON-ESSENTIAL ACTIVITIES within 15 ft of the AFFECTED MAR. <u>AND</u> D.2 Place the AFFECTED MAR inside the appropriate DEFINED AREA.	IMMEDIATELY 7 days

1. See Basis A4.1.6, Application to Safety Analysis section, for composite source term calculation method.

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

4.1.6 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.1.6.1	VERIFY the total above-ground TRU MAR inventory is $\leq 57,000$ PE-Ci.	Annually
SR 4.1.6.2	VERIFY the total above-ground TRITIUM WASTE MAR inventory is $\leq 4,000,000$ tritium Ci.	Annually
SR 4.1.6.3	VERIFY that the calculated product of the actual above-ground TRU WASTE inventory and the actual waste matrix composition results in a composite source term ¹ ≤ 1.06 PE-Ci. ¹	Annually
SR 4.1.6.4	VERIFY that above-ground MAR is located inside a DEFINED AREA appropriate to the waste and container type.	Annually

1. See Basis A4.1.6, Application to Safety Analysis section, for composite source term calculation method.

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.1 RADIOLOGICAL INVENTORY MANAGEMENT

3.1.7 TRU WASTE Drum DOUBLEPACK

LCO: Above-ground TRU Waste Drums with ≥ 200 PE-Ci SHALL be DOUBLEPACKED.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: All above-ground DEFINED AREAS, excluding RETRIEVAL AREAS.

----- NOTE -----

This LCO is not applicable to; 1) cemented and vitrified waste forms, 2) waste packaged in a POC, 3) during the temporary removal of a drum from a DOUBLEPACK during repackaging or characterization with a High Efficiency Neutron Counter (HENC) or other NDE/NDA device, and 4) SSSR activities.

----- NOTE -----

Separate CONDITION entry is allowed for each AFFECTED drum

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. An above-ground TRU WASTE drum with ≥ 200 PE-Ci not DOUBLEPACKED.	A.1 Isolate the AFFECTED drum from other drums by ≥ 7 ft.	4 hours
	<u>AND</u> A.2 DOUBLEPACK the AFFECTED drum.	7 days

4.1.7 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.1.7.1	VERIFY that all above-ground TRU WASTE drums outside of RETRIEVAL AREAS with ≥ 200 PE-Ci are DOUBLEPACKED.	Quarterly

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.2 FIRE PROTECTION CONTROLS

3.2.1 Thermal Separation Distances

LCO:

1. TRU STORAGE AREAS, PROCESS AREAS and RETRIEVAL AREAS containing only METAL CONTAINERS and all TRITIUM AREAS SHALL have the following minimum Thermal Separation Distances:

Thermal Separation Distance with no LIQUID IMPEDIMENT	OR	Thermal Separation Distance with an established LIQUID IMPEDIMENT
22 ft		7 ft

2. TRU STORAGE AREAS, PROCESS AREAS and RETRIEVAL AREAS containing one or more non-METAL CONTAINERS SHALL have the following minimum Thermal Separation Distances:

Thermal Separation Distance with no LIQUID IMPEDIMENT	OR	Thermal Separation Distance with an established LIQUID IMPEDIMENT
43 ft		24 ft

3. An SSSR AREA SHALL have the following minimum Thermal Separation Distances:

With non-METAL CONTAINERS	OR	With non-METAL CONTAINERS with an established STATIONARY FIRE WATCH	OR	With only METAL CONTAINERS
24 ft		10 ft		10 ft

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: The applicable DEFINED AREAS as stated in LCO statement except as noted below.

----- NOTE -----

This LCO is not applicable to:

1. DEFINED AREAS containing only BG Spheres/metal spheres or CMPs.
2. Items in transit to and from DEFINED AREAS.
3. The distance between EXPOSED MAR and the impediment for liquid fueled retrieval equipment located at Pit 9 and Trenches A-D.
4. LOW ACTIVITY AREAS.

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

----- NOTE -----
 A separate entry CONDITION is allowed for each AFFECTED TRU STORAGE AREA, PROCESS AREA, TRITIUM AREA, SSSR AREA, or RETRIEVAL AREA.

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. Thermal Separation Distances are not met.	A.1 Place the AFFECTED TRU STORAGE AREA, PROCESS AREA, TRITIUM AREA, SSSR AREA, or RETRIEVAL AREA in WARM STANDBY.	IMMEDIATELY
	<u>AND</u> A.2 Establish a STATIONARY FIRE WATCH for the AFFECTED TRU STORAGE AREA, PROCESS AREA, TRITIUM AREA, SSSR AREA, or RETRIEVAL AREA.	2 hours
	<u>AND</u> A.3 Restore Minimum Thermal Separation Distance	24 hr

4.2.1 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.2.1.1	VERIFY Minimum Thermal Separation Distances are met.	Monthly <u>AND</u> Prior to changing the container type in a TRU STORAGE AREA, PROCESS AREA, TRITIUM AREA, SSSR AREA, or RETRIEVAL AREA
SR 4.2.1.2	VERIFY LIQUID IMPEDIMENTs are capable of containing or diverting 100 gal of liquid.	Upon initial establishment of a LIQUID IMPEDIMENT
SR 4.2.1.3	VERIFY established LIQUID IMPEDIMENTs remain capable of containing or diverting 100 gal of liquid.	Monthly

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.2 FIRE PROTECTION CONTROLS

3.2.2 Control of TRANSIENT COMBUSTIBLES – FUEL PACKAGE Limit

LCO: Within applicable DEFINED AREAS and their associated Thermal Separation Distances, FUEL PACKAGES SHALL be controlled as follows:

1. FUEL PACKAGES SHALL be ATTENDED.

OR

- 2a. Each FUEL PACKAGE SHALL be ≤ 100 lb of TRANSIENT COMBUSTIBLE material.

AND

- 2b. FUEL PACKAGES SHALL be ≥ 9 ft away from non-metal waste containers and other FUEL PACKAGES.

AND

- 2c. FUEL PACKAGES SHALL be ≥ 3 ft away from METAL CONTAINERS.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: All DEFINED AREAs and their associated Minimum Thermal Separation Distances, except as noted below.

----- NOTES -----

1. This LCO does not apply to FUEL PACKAGES in transit or to combustible/flammable liquids. Stored non-metal waste containers such as FRPs, radiological barrier devices, and boundary markers (e.g., rope, plastic stanchions, signs) are not counted as TRANSIENT COMBUSTIBLE FUEL PACKAGES.
 2. This LCO does not apply to LOW ACTIVITY AREAS.
 3. Separate entry CONDITION is allowed for each AFFECTED DEFINED AREA and its associated Thermal Separation Distance.
-

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.2.2 Control of TRANSIENT COMBUSTIBLES – FUEL PACKAGE Limit

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
<p>A. A FUEL PACKAGE is not ATTENDED.</p> <p><u>AND</u></p> <p>A FUEL PACKAGE is > 100 lb of TRANSIENT COMBUSTIBLE material,</p> <p><u>OR</u></p> <p>A FUEL PACKAGE is < 9 ft away from non-metal waste containers or other FUEL PACKAGES,</p> <p><u>OR</u></p> <p>A FUEL PACKAGE is < 3 ft away from METAL CONTAINERS.</p>	<p>A.1.1 ATTEND FUEL PACKAGE</p> <p><u>OR</u></p> <p>A.1.2 Remove FUEL PACKAGE from AFFECTED DEFINED AREA and its associated Minimum Thermal Separation Distance.</p>	<p>2 hours</p> <p>2 hours</p>

4.2.2 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.2.2.1	VERIFY that, within applicable DEFINED AREAS and their associated Thermal Separation Distances, FUEL PACKAGES are each \leq 100 lb of TRANSIENT COMBUSTIBLE material or ATTENDED.	Weekly
SR 4.2.2.2	VERIFY that, within applicable DEFINED AREAS and their associated Thermal Separation Distances, FUEL PACKAGES are \geq 9 ft away from non-metal waste containers and other FUEL PACKAGES or ATTENDED.	Weekly
SR 4.2.2.3	VERIFY that, within applicable DEFINED AREAS and their associated Thermal Separation Distances, FUEL PACKAGES are \geq 3 ft away from METAL CONTAINERS or ATTENDED.	Weekly

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

4.2.2 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.2.2.4	VERIFY that, for FUEL PACKAGES that do not meet LCO Statements 2a, 2b, and 2c, the FUEL PACKAGES are ATTENDED.	Shiftly

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.2 FIRE PROTECTION CONTROLS

3.2.3 Control of Liquid Run-On

LCO: LIQUID IMPEDIMENTs SHALL be established between liquid fueled retrieval equipment and the edge of Pit 9/Trenches A-D.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: Pit 9 and Trenches A-D RETRIEVAL AREAs when liquid fueled retrieval equipment is present at Pit 9/Trenches A-D, excluding time during reconfigurations needed to accommodate relocation of the retrieval equipment.

----- NOTE -----

A separate entry CONDITION is allowed for each AFFECTED Pit 9/Trenches A-D RETRIEVAL AREA.

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. LIQUID IMPEDIMENTs not established between the liquid fueled retrieval equipment and the edge of Pit 9/Trench A-D.	A.1 ATTEND the retrieval equipment located at the AFFECTED Pit 9/Trench A-D.	IMMEDIATELY
	<p style="text-align: center;"><u>AND</u></p>	
	A.2 Place the AFFECTED Pit 9/Trench A-D in WARM STANDBY.	2 hours
	<p style="text-align: center;"><u>AND</u></p>	
	A.3.1 Establish a LIQUID IMPEDIMENT between liquid fueled retrieval equipment and the edge of PIT 9/Trenches A-D.	24 hours
	<p style="text-align: center;"><u>OR</u></p>	
	A.3.2 Remove the liquid fuel source from the AFFECTED RETRIEVAL AREA.	24 hours

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

4.2.3 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.2.3.1	VERIFY that LIQUID IMPEDIMENTs are capable of containing or diverting the full liquid fuel capacity of the retrieval equipment stationed at the RETRIEVAL AREA.	Prior to the start of retrieval activities <u>AND</u> After relocation of liquid fueled retrieval equipment at an active RETRIEVAL AREA
SR 4.2.3.2	VERIFY established LIQUID IMPEDIMENTs remain capable of containing or diverting full liquid fuel capacity of the retrieval equipment stationed at the RETRIEVAL AREA.	Monthly

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.3 COMBUSTIBLE/FLAMMABLE LIQUID CONTROLS

3.3.1 Combustible/Flammable Liquid Controls in DEFINED AREAS and Associated Thermal Separation Distance

LCO: The following combustible/flammable liquid limits SHALL be met in an individual DEFINED AREA and its associated thermal separation distance:

- 1a. For DEFINED AREAS containing only METAL CONTAINERS: Volumes > 7 gal SHALL be ATTENDED.

OR

- 1b. For DEFINED AREAS containing non-METAL CONTAINERS: All combustible/flammable liquids SHALL be ATTENDED.

AND

2. The total volume SHALL be ≤ 100 gal.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: DEFINED AREAs and applicable Thermal Separation Distance (See Note 2)

The following are excluded from the requirements of this LCO:

- Propane since it is not considered a liquid fuel in the accident analysis
- TRU WASTE container contents
- LLW/MLLW waste container contents
- The liquids contained in equipment used for the nondestructive assay/nondestructive examination (NDA/NDE) activity
- Combustible/flammable liquids with a flammability rating of 0 and 1
- The area within LIQUID IMPEDIMENTs surrounding liquid fueled retrieval equipment located at Pit 9 and Trenches A-D.
- LOW ACTIVITY AREAS

----- NOTES -----

1. Separate CONDITION entry is allowed for each AFFECTED DEFINED AREA and associated Thermal Separation Distance
 2. The applicable Thermal Separation Distances for DEFINED AREAS are established in LCO 3.2.1.
-

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.3 COMBUSTIBLE/FLAMMABLE LIQUID CONTROLS

4.3.1 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.3.1.1	VERIFY that the combustible/flammable liquid volumes >7 gal intended for introduction in each DEFINED AREA and associated Thermal Separation Distance containing only METAL CONTAINERS are ATTENDED.	Prior to introducing the combustible/flammable liquid into the applicable DEFINED AREA and/or associated Thermal Separation Distance.
SR 4.3.1.2	VERIFY that all combustible/flammable liquids in each DEFINED AREA and associated Thermal Separation Distance containing non-METAL CONTAINERS are ATTENDED.	Prior to introducing the combustible/flammable liquid into the applicable DEFINED AREA and/or associated Thermal Separation Distance.
SR 4.3.1.3	VERIFY that the total volume of combustible/flammable liquids in each DEFINED AREA and associated Thermal Separation Distance is \leq 100 gal.	Prior to introducing the combustible/flammable liquid into the applicable DEFINED AREA and/or associated Thermal Separation Distance.

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.4 TRU WASTE CONTAINER MANAGEMENT

3.4.1 Above-Ground UNVENTED TRU WASTE DRUMS

LCO: UNVENTED TRU WASTE DRUMs that are above-ground SHALL be:

1. Located in an access restricted ISOLATION AREA
- AND**
2. Not stacked

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: Above-ground DEFINED AREAs, excluding RETRIEVAL AREAs and Drum Venting process areas

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. UNVENTED TRU WASTE DRUMs that are above-ground are located outside an access restricted ISOLATION AREA.	A.1 Stop NON-ESSENTIAL ACTIVITIES within 15 ft of the AFFECTED UNVENTED TRU WASTE DRUM.	IMMEDIATELY
	<u>AND</u>	
	A.2.1 Place UNVENTED TRU WASTE DRUM in an access restricted ISOLATION AREA.	48 hr
	<u>OR</u>	
	A.2.2 Place UNVENTED TRU WASTE DRUM in an OVERPACK.	48 hr
B. UNVENTED TRU WASTE DRUMs that are aboveground are stacked.	B.1 Un-stack UNVENTED TRU WASTE DRUM.	24 hr

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.4 TRU WASTE CONTAINER MANAGEMENT

4.4.1 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.4.1.1	VERIFY UNVENTED TRU WASTE DRUMs that are above-ground are located in an access restricted ISOLATION AREA and the ISOLATION AREA includes a 15-ft separation distance.	Weekly
SR 4.4.1.2	VERIFY UNVENTED TRU WASTE DRUMs in the ISOLATION AREA are not stacked.	Weekly, when UNVENTED TRU WASTE DRUMs are present in the ISOLATION AREA <u>AND</u> After an unvented drum is placed in the ISOLATION AREA.

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.4 TRU WASTE CONTAINER MANAGEMENT

3.4.2 UNVENTED TRU WASTE DRUM HANDLING and TRANSPORT

LCO: During HANDLING (other than MINOR MOVEMENT) of UNVENTED TRU WASTE DRUMS, a lid restraining device SHALL be installed.

UNVENTED TRU WASTE DRUMS being TRANSPORTED SHALL:

1. Have a lid restraining device installed.

AND

- 2a. Have a shielding/engineered barrier between the UNVENTED TRU WASTE DRUM and the worker.

OR

- 2b. Maintain safe standoff distance ≥ 30 ft between the UNVENTED TRU WASTE DRUM and the worker.

----- NOTE -----

TRU WASTE drums removed from Pit 9 or Trenches A-D are treated as UNVENTED TRU WASTE DRUMs until demonstrated to be vented or OVERPACKED

MODE APPLICABILITY: OPERATION when HANDLING or TRANSPORTING non-OVERPACKED UNVENTED TRU WASTE DRUMs

----- NOTE -----

This LCO is not applicable during MINOR MOVEMENTS.

AREA APPLICABILITY: Area G

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.4 TRU WASTE CONTAINER MANAGEMENT

4.4.2 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.4.2.1	VERIFY UNVENTED TRU WASTE DRUMS being HANDLED or TRANSPORTED have a lid restraining device installed.	Prior to initiating an UNVENTED TRU WASTE DRUMS HANDLING or TRANSPORT activity
SR 4.4.2.2	VERIFY UNVENTED TRU WASTE DRUMS being TRANSPORTED have either a shielding/engineered barrier or a safe standoff distance ≥ 30 ft between the UNVENTED TRU WASTE DRUMS and the workers.	Prior to initiating an UNVENTED TRU WASTE DRUMS TRANSPORT activity

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

3.5 VEHICLE/EQUIPMENT CONTROLS

3.5.1 Vehicle/Equipment Safety Control – Refueling Location

LCO: Minimum Refueling Separation Distances between vehicle/equipment refueling locations and DEFINED AREAS SHALL meet the following criteria:

Capacity of Refueling Vehicle at Refueling Location	Minimum Refueling Separation Distance to DEFINED AREA with non-metal waste containers (ft)	Minimum Refueling Separation Distance to DEFINED AREA with only METAL CONTAINERS (ft)
> 7 gal and ≤ 100 gal	43	22
> 100 gal and ≤ 500 gal	71	45
> 500 gal and ≤ 5,000 gal	203	141

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: Area G DEFINED AREAS (excluding LAAs) when a refueling vehicle with a capacity of > 7 gal liquid fuel is present in the refueling location.

----- NOTE -----

This LCO is not applicable to refueling locations involving only propane cylinders.

The LCO separation distance is not applicable to the hose between the refueling vehicle and the vehicle/equipment undergoing refueling, or to refueling vehicles located downhill from the RETRIEVAL AREAS.

----- NOTE -----

Separate entry CONDITION is allowed for each AFFECTED DEFINED AREA and its associated Refueling Separation Distance

ACTIONS:

CONDITION	ACTION	COMPLETION TIME
A. Minimum Refueling Separation Distance not met.	A.1 Stop refueling of vehicles/equipment at AFFECTED vehicle/equipment refueling location.	IMMEDIATELY
	<u>AND</u> A.2 Move the refueling operation to meet the LCO.	4 hr

3.5 VEHICLE/EQUIPMENT CONTROLS

3/4 OPERATING LIMITS AND SURVEILLANCE REQUIREMENTS

4.5.1 SURVEILLANCE REQUIREMENTS:

NUMBER	SURVEILLANCE REQUIREMENT	FREQUENCY
SR 4.5.1.1	VERIFY Minimum Refueling Separation Distances are met.	Prior to the establishment of a new refueling location or modifying the boundaries of an existing refueling location <u>AND</u> Prior to the establishment of a DEFINED AREA or change of container type within a DEFINED AREA.

5.0 ADMINISTRATIVE CONTROLS

SECTION 5.0 ADMINISTRATIVE CONTROLS

5.0 ADMINISTRATIVE CONTROLS

5.1 PURPOSE

The purpose of ACs is to state the provisions relating to organization and management, procedures, record keeping, review and audit, reporting, and safety management programs necessary to ensure safe operations of the TA-54, Area G site.

Unless otherwise noted, these ACs are applicable to TA-54, Area G at all times.

5.2 ORGANIZATION AND MANAGEMENT RESPONSIBILITIES

5.2.1 Facility Operations Director (FOD) or Designee

The FOD for the TA-54, Area G site is:

- Responsible for nuclear safety at the TA-54, Area G site and is the Los Alamos National Laboratory (LANL) point of contact for all issues on nuclear safety.

5.2.2 FOD or Designee

The FOD is responsible for the following:

1. Overall operation of the TA-54, Area G site, except as delegated in writing the succession of this responsibility during any absence.
2. Operating the TA-54, Area G site in accordance with approved TSRs.
3. Facilitating and controlling physical changes in TA-54, Area G configuration and coordinating the activities of all work groups within TA-54, Area G.
4. Ensuring that on-call support personnel (e.g., management, radiological control, and technical support personnel) are assigned.
5. Ensuring that TA-54, Area G operations are carried out by qualified personnel according to written procedures.
6. The authority designated to take emergency ACTIONS in accordance with AC 5.3.5.

5.0 ADMINISTRATIVE CONTROLS

5.2.3 Staffing Requirements

Table 5.2.3-1 lists the minimum staffing requirements for implementation of Area G TSRs:

Table 5.2.3-1 Minimum Staffing Requirements^(5,6)

Area G Status	SOS	Ops Center Operator	STATIONARY FIRE WATCH ⁽³⁾	Nuclear Operator
When MAR is present and TRU WASTE operational activities are being performed within Area G ⁽¹⁾	R ⁽⁴⁾	R	C	R
When MAR is present and No TRU WASTE operational activities are being performed within Area G ⁽²⁾	C	C	C	C
When No above ground TRU MAR is present within Area G	N/A	N/A	N/A	N/A

R = Required at TA-54
 C = On Call and Responds within 2 hr
 SOM = Shift Operations Manager
 SOS = Shift Operations Supervisor

(1) TRU Waste operational activities are those that include active waste handling (e.g., container movement, characterization, processing, SSSR activities), in addition to passive storage.
 (2) Only passive storage of MAR (above ground and below ground), and support activities such as visual inspections, security patrols, freeze protection rounds, institutionally required fire department responses, and other activities not involving opening or handling of radioactive material are allowed.
 (3) If qualified, a Nuclear Operator may also fulfill minimum staff requirements for STATIONARY FIRE WATCH.
 (4) SOM may cover the SOS position.
 (5) Minimum staffing requirements, with 2-hr response times, accommodate off-shift hours when Area G is normally not staffed with onsite personnel.
 (6) Minimum staffing requirements may be less than the minimum requirement defined above for a period of time not to exceed 2 hrs in order to accommodate unexpected absence of on-duty personnel, provided immediate action is taken to restore the minimum staffing requirements. This is not applicable to "C" items listed in the Table.

5.0 ADMINISTRATIVE CONTROLS

5.3 TECHNICAL SAFETY REQUIREMENTS

5.3.1 General

The TSRs SHALL:

1. Be maintained as a controlled document.
2. Be procedurally controlled in accordance with LANL requirements, to require that National Nuclear Security Administration (NNSA) approve changes prior to incorporation into the TSR.

5.3.2 Compliance

The FOD through the SOM or designee is responsible for ensuring that the requirements of the TA-54, Area G TSRs are met. Compliance SHALL be demonstrated by:

1. Operating within the LCOs and associated SRs during their Applicability.
2. Operating within the ACTIONS of LCOs when required.
3. Performing all SRs when required.
4. Establishing, implementing, and maintaining the required ACs.

5.3.3 VIOLATION of TSR

Violations of the TSR occur as the result of the following.

1. Failure to complete an ACTION statement within the required COMPLETION TIMES following.
 - Exceedance of an LCO, or
 - Failure to successfully meet the SR.
2. Failure to perform an SR or ISI within the required FREQUENCY.
 - When equipment or a component fails an SR, the ACTION required by the TSR for the inoperable equipment or component is taken. Failure to take the ACTION is a TSR violation. When a Design Feature fails an ISI, that failure is new information, which SHALL be evaluated for initiation of the Potential Inadequacy of the Safety Analysis (PISA) process. Failure of an ISI is not a TSR violation, except as provided in item 4 below. If an SR or ISI is not performed within its required time interval, including any extension allowed by SR 4.0.2 or DF 6.0.2, it is considered to be a violation of the TSR.
3. Failure to comply with an AC statement.
 - There are two different types of failures to comply with an AC statement. The first type is when the AC is directly violated, as would be the case for a directive language Specific Administrative Control (SAC) requirement, as would be the case with not meeting minimum staffing requirements. A single failure to comply constitutes a TSR violation.

5.0 ADMINISTRATIVE CONTROLS

- The second type of AC violation is when the intent of a program included in the ACs is not fulfilled. A single non-compliance would not necessarily constitute a TSR violation. To qualify as a TSR violation, the failure to meet the intent of the referenced program would need to be significant enough to render the BIO summary invalid.
- 4. Failure of a Design Feature to meet its respective performance criteria, functional requirements, or safety function following being placed in service after a planned or inadvertent modification. Damage from an accident or natural phenomena event, or wear or age-related degradation is not considered a modification.

5.3.4 Response to a TSR VIOLATION

If a TSR violation occurs, the following ACTIONS SHALL be taken:

1. Notify DOE/NNSA of the violation in accordance with DOE requirements.
2. Prepare an occurrence report in accordance with DOE requirements.

5.3.5 Conditions Outside TSRs

Site personnel may take actions that depart from the requirements of a TSR provided

1. an emergency situation exists; and
2. these actions are needed immediately to protect workers, the public, or the environment from imminent and significant harm; and
3. no ACTION consistent with the TSR is immediately apparent.

Such action must be approved by a person in authority as designated in the TSRs for nonreactor nuclear facilities (for Area G, the person in authority is the Facility Operations Director (FOD); this authority may be delegated in writing by the FOD). If emergency action is taken, both a verbal notification should be made to the responsible head of the field element and a written report made to the Cognizant Secretarial Officer within 24 hr.

5.4 PROCEDURES

Procedures are established, implemented, and maintained in accordance with LANL requirements governing conduct of operations. Procedures are not limited to those items specifically identified as procedure types (for example, operating, chemistry, system, test, surveillance, and emergency plan) but could include anything described in the Safety Basis that defines or describes activities or controls over the conduct of work. Changes to these activities or controls qualify as changes to procedures as described in the Safety Basis, and therefore must be evaluated through the Unreviewed Safety Question (USQ) process.

5.0 ADMINISTRATIVE CONTROLS

5.5 REVIEW AND AUDIT

5.5.1 General

This section summarizes the programs that ensure independent oversight, safety review, USQ determination, and appraisal of safety performance in accordance with Laboratory procedures.

5.5.2 Management Self-Assessments

A program is implemented in accordance with LANL requirements, requiring that line management periodically review activities to ensure they are conducted in a safe manner. Examples of elements that should be reviewed include but are not limited to:

1. Procedures;
2. USQ determinations;
3. Programs;
4. Building/facility changes and modifications;
5. Facility operation;
6. Maintenance and testing;
7. Laboratory, DOE, and industry issues with potential generic safety significance; and
8. TSR compliance.

5.5.3 Independent Reviews

Reviews are conducted by individuals independent of the line management organizations. The objective of the independent review program is to assist line management in assessing work performance and identify areas for improvement. Examples of subjects that independent reviews should evaluate include but are not limited to:

1. TSR implementation;
2. USQ determinations;
3. Proposed changes to the TSRs;
4. Occurrence reports; and
5. Configuration management program implementation.

5.0 ADMINISTRATIVE CONTROLS

5.5.4 Audits

A Laboratory audit program is established and conducted by a group independent of the facility or operations personnel to assess whether operations are in accordance with the TA-54, Area G Safety Basis, including these TSRs, and Laboratory requirements. Examples of subjects the audit program might include are the following:

1. Conformance with the TSRs;
2. Training and qualification of the facility and operations staff;
3. Program implementation;
4. Effectiveness of corrective actions; and
5. Adherence to Quality Assurance (QA) Program requirements.

5.6 SAFETY MANAGEMENT PROGRAMS (SMPS)

5.6.1 Unreviewed Safety Question Program

The Unreviewed Safety Question (USQ) program SHALL be implemented and maintained in accordance with the LANL requirements (SB112-3, *Unreviewed Safety Question (USQ) Process* or successor document). Annually, as required by 10 CFR 830.203, a summary of all USQ determinations for changes that have been implemented since the last submittal SHALL be submitted to DOE.

5.6.2 Emergency Preparedness Program

An Emergency Preparedness Program is established, implemented and maintained at TA-54, Area G in accordance with the LANL requirements (PD 1200, or successor documents). The program addresses emergency preparedness planning, including activation of emergency organizations, assessment actions, notification processes, emergency facilities and equipment, protective actions, training and exercises, and recovery actions. The program also relies on adverse conditions being recognized by workers and reported to the Operations Center, which notifies facility and site personnel and helps to direct the response.

5.6.3 Nuclear Criticality Safety Program

The Nuclear Criticality Safety Program is implemented to preclude inadvertent nuclear criticality at TA-54, Area G. General limits and controls are applied to fissionable material operations to ensure subcritical configurations under all normal and credible abnormal conditions. The LANL Nuclear Criticality Safety Program is established implemented and maintained for TA-54, Area G operations in accordance with LANL requirement (SD 130, or successor documents). The Nuclear Criticality Safety Program establishes requirements for process specific criticality safety evaluations and emergent nuclear criticality safety issues (e.g., special disposal conditions, safety evaluations, limits, repackaging, and SSSR activities that combine drum contents).

5.0 ADMINISTRATIVE CONTROLS

5.6.4 Fire Protection Program

A Fire Protection Program is established, implemented, and maintained in accordance with LANL requirements (PD 1220, or successor document). This program develops and maintains fire protection (e.g., proper housekeeping, control of combustibles, control of ignition sources, control of cutting, welding, and other hot work) and fire control measures (e.g., detection and alarm systems as available, STATIONARY FIRE WATCHES, firefighting equipment, fire fighting personnel and responsibilities) for the protection of personnel and structures within TA-54, Area G. The Fire Protection Program provides information on the interface relationships between the Laboratory, Los Alamos County Fire Department, and NNSA.

The objective and purpose of the LANL fire protection program is to minimize the potential for the occurrence of a fire or related event; injury or loss of life from fire or related event; fires that cause an unacceptable on-site or off-site release of hazardous or radiological material that could impact the safety and health of employees, the public, or the environment; unacceptable interruption of a DOE and/or NNSA designated vital program or loss of a LANL-designated mission-critical program or activity as a result of a fire or related event; property loss from a fire or related event exceeding the defined limits established by LANL; and, fire damage to critical processes safety controls and SSCs as established by the safety analysis. The program also ensures a yearly review at a minimum by the fire protection engineer (FPE) of the TA-54, Area G Facility. The following are elements of the Fire Protection Program:

1. Ignition source controls are established within DEFINED AREAS.
2. When used for TRU METAL CONTAINER storage, pallets will be noncombustible.
3. Periodic inspections for housekeeping are conducted to minimize solid TRANSIENT COMBUSTIBLES, and vegetation control, to include inspection by a LANL FPE.
4. When used for maintenance activities, acetylene gas cylinders are equipped with flashback arrestors.

5.6.5 Radiation Protection Program

A Radiation Protection Program is established, implemented and maintained in accordance with LANL requirements (P 121, or successor document). These documents comply with the requirements of 10 CFR 835, Occupational Radiation Protection. The Radiation Protection Program evaluates radiological conditions and processes for worker protection. Radiation protection training helps ensure that radiation doses are maintained as low as reasonably achievable (ALARA) at the TA-54, Area G site. The following element of the Radiation Protection Program is implemented by procedures:

- Venting of unvented drums will be performed within a contamination-controlled environment.

5.6.6 Maintenance Program

A program SHALL be implemented to ensure that SSCs are maintained to meet the performance criteria, functional requirements, and the safety function established in the approved safety basis and associated engineering documentation.

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The Maintenance Program is implemented to ensure that facility SSCs are maintained and controlled so they continue to provide those safety functions, functional requirements, and performance criteria credited in the BIO. In-Service Inspections (ISI) are covered under the maintenance program and are implemented to provide reasonable assurance that the DFs are inspected on a FREQUENCY sufficient to demonstrate they continue to meet the credited safety functions, functional requirements, and performance criteria in the BIO. Section 6 of the TSRs describes the required ISIs and FREQUENCY for each DF. Facility procedures may determine additional inspections and/or respective frequencies that need to be performed. The maintenance program ensures that structural or functional degradation is detected to permit corrective action before the function of the SSC is compromised.

The TA-54, Area G Maintenance Program is established and maintained in compliance with the DOE-approved Laboratory Procedure P950, *Conduct of Maintenance*, or successor document, which asserts compliance with DOE Order 433.1B, *Maintenance Management Programs for DOE Nuclear Facilities* and provides details of the program and its implementation. A graded approach is applied towards implementing the requirements of the Order. Maintenance activities include all necessary supporting functions for ensuring that the facility continues to operate normally. Maintenance is a critical function to ensure reliability.

The following are elements of the Maintenance Program:

1. Periodic inspection and maintenance of LANL vehicles and equipment (e.g., forklift and transportation truck).

5.6.7 Configuration Management Program

The Configuration Management Program is established, implemented and maintained for the TA-54, Area G site in accordance with Laboratory requirements (PD 341, or successor documents) . The purpose of this program is to identify and document the technical baseline of configuration control items and to protect equipment integrity. Laboratory requirements ensure that changes to the technical baseline are properly identified, developed, assessed (technically reviewed and validated), approved, scheduled, implemented, and documented.

5.6.8 Quality Assurance Program

A QA Program is established, implemented, and maintained at the TA-54, Area G site in accordance with LANL requirements (SD 330 or successor documents). The QA Program establishes the process for procurement and maintenance to control the integrity and reliability of Safety-Class (SC)/Safety-Significant (SS)-SSCs and implementation of other SACs and safety management programs.

5.6.9 Vehicle/Equipment Safety Controls

Vehicle/equipment safety controls SHALL be established, implemented and maintained to ensure that DEFINED AREAS are protected and to ensure these vehicles/equipment are maintained and operated in an effective, but safe manner. The following are elements of the Vehicle/Equipment Safety Controls:

- 1) Posted speed limit within TA-54, Area G is ≤ 15 mph.
- 2) Electric-powered vehicles/equipment are charged in locations where hydrogen gas does not accumulate (e.g., domes, ventilated enclosures, outdoors).

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- 3) Vehicle crash barrier placement around areas that are non-HIGH RISK LOCATIONS where TRU WASTE is stored.

5.6.10 Conduct of Operations

A Conduct of Operations program is established, implemented and maintained in accordance with LANL requirements (P 315, or successor documents). The Conduct of Operations program addresses areas such as operations organization, shift operating practices including training, turnover, and log keeping, communications, investigations of abnormal events and notifications, lockout and tagouts, and independent verification. Conduct of Operations addresses developing and implementing the controls needed to perform the work safely and securely.

5.6.11 Hazardous Material and Waste Management Program

A hazardous material and waste management program SHALL be established, implemented and maintained in accordance with LANL requirements (SD 400, P 101-14, P 101-34, and P 409 or successor documents). The program's purpose is to control personnel exposure to hazardous materials by identifying and limiting contact with hazardous materials, adhering to established occupational exposure limits, implementing administrative and engineered controls, and using personal protective equipment. The following are elements of the hazardous material and waste management controls:

(1) OVERPACK Control

- TRU WASTE drums in degraded, suspect degraded, or damaged condition (i.e., not in a good and unimpaired condition) are OVERPACKED.

(2) TRU WASTE Container Inspection

- TRU WASTE is packaged in structurally sound, noncombustible containers except as permitted in SSSR AREAs or legacy waste (e.g., packaged in FRPs). The Facility implements procedures that require operators to visually inspect TRU WASTE containers for integrity and/or vents when HANDLING or TRANSPORTING containers. These procedures require the identification of deficiencies and the implementation of appropriate corrective actions.

Note: Non-COMPLIANT, non-metal TRU WASTE containers are inspected when HANDLED or TRANSPORTED to confirm that the TRU WASTE containers are not radiologically contaminated.

(a) Inspection for COMPLIANT, metal TRU WASTE containers of sound integrity:

COMPLIANT, metal TRU WASTE containers are inspected when HANDLED or TRANSPORTED, in order to confirm that the TRU WASTE container is intact, and shows no signs of degradation by inspecting for the following:

- The TRU WASTE container is not obviously degraded. Discussion: Obviously degraded means clearly visible and potentially significant defects in the TRU WASTE container or TRU WASTE container surface.
- There is no evidence that the TRU WASTE container is, or has been, pressurized. Discussion: Pressurization can be indicated by a fairly uniform expansion of the sidewalls, bottom, or top.

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Past pressurization can be indicated by a notable outward deflection of the bottom or top. VERIFY that the drum is not warped.

- There is no potentially significant rust or corrosion such that wall thinning, pinholes, or breaches are likely or the load bearing capacity is suspect. Discussion: Rust is assessed in terms of its type, extent, and location. Pitting, pocking, flaking, or dark coloration characterizes potentially significant rust or corrosion. This includes the extent of the TRU WASTE container surface area, cover, thickness, and, if it occurs in large flakes or built-up (caked) areas. Rusted TRU WASTE containers may not meet inspection if:
 - Rust is present in caked layers or deposits.
 - Rust is present in the form of deep metal flaking or built-up areas of corrosion products. In addition, the location of rust should be noted; for example, on a drum: top lid; filter region; locking chine; top one-third, above the second rolling hoop; middle one-third, between the first and second rolling hoops; bottom one-third, below the second rolling hoop; and on the bottom. TRU WASTE containers may still be considered acceptable if the signs of rust show up as follows:
 1. Some discoloration on the TRU WASTE container
 2. If rubbed, rust would produce fine grit or dust or minor flaking (such that wall thinning does not occur).
- There are no split seams, tears, obvious holes, punctures (of any size), creases, broken welds, or cracks. Discussion: TRU WASTE containers with obvious leaks, holes or openings, cracks, deep crevices, creases, tears, broken welds, sharp edges or pits are either breached or on the verge of being breached.
- The TRU WASTE container is properly closed. Discussion: Inspect the fastener and fastener ring (chine), if applicable, for damage or excessive corrosion. Check the alignment of the fastener to ensure that it is in firm contact around the entire lid and that the TRU WASTE container will not open during TRANSPORTATION.
- There are no dents, scrapes, or scratches that make the TRU WASTE container structural integrity questionable, or that prevent the top and bottom surfaces from being parallel. Discussion: Deep gouges, scratches, or abrasions over wide areas are not acceptable. If the top and bottom surfaces are not parallel, this indicates that the container is warped. Dents should be examined to determine impact of structural integrity.
- There is no discoloration, which would indicate leakage or other evidence of leakage of material from the TRU WASTE container. Discussion: Examine the TRU WASTE container regions near vents, top lid fittings, bottom fittings, welds, seams, and intersections of one or more metal sheets or plates. TRU WASTE containers will not meet inspection requirements if leakage is present.
- The TRU WASTE container is not bulged. Discussion: For the purposes of this examination, bulging is indicated by the following:

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- A fairly uniform expansion of the sidewalls, bottom, or top (e.g., in the case of a drum, either the top or bottom surface protrudes beyond the planar surface of the top or bottom ring)
- A protrusion of the side wall (e.g., in the case of a drum, beyond a line connecting the peaks of the surrounding rolling hoops or a line between a surrounding rolling hoop and the bottom or top ring)
- Expansion of the sidewall (e.g., in the case of a drum, such that it deforms any portion of a rolling hoop)
- o The container is visually inspected to determine if the container is noncombustible.

(b) Inspection for vents on COMPLIANT, metal TRU WASTE containers:

- o The container is visually inspected to determine if the container is properly vented.
Discussion: For the purposes of this examination, a container is not properly vented if the venting mechanism is visually clogged or incapable of functioning properly, if the container is bulged or pressurized. An installed WIPP-approved filter is not considered to block the vent.

The nature of drum handling/movement activities already requires constant surveillance of the drums. The SMP element for COMPLIANT, metal TRU WASTE container inspections ensures their confinement integrity and presence of a vent. Periodic inspections are performed based on procedural implementation. A representative sample of containers that are accessible should receive a visual inspection. The movement of containers is not required to perform a periodic inspection.

(3) Waste Acceptance Criteria

- Radioactive waste received at the TA-54, Area G site must comply with the LANL WAC or an approved LANL exception.

(4) Inclement Weather Control

- Suspend outdoor activities associated with HANDLING/TRANSPORTING of radioactive waste during inclement weather (e.g., sustained high winds, lightning, etc.).

(5) Access Restrictions for the ISOLATION AREA

- The access restrictions for the ISOLATION AREA are as follows:
 - o Normal operations within the ISOLATION AREA are restricted to only those necessary to disposition UNVENTED TRU WASTE DRUMS, such as applying or removing a lid restraining device, performing head space gas sampling, or using a forklift to move or remove the UNVENTED TRU WASTE DRUM, or performing surveillances and inspections for regulatory compliance;
 - o To prevent inadvertent access to the area, barriers or posting will be placed around the ISOLATION AREA;
 - o A 15-ft exclusion area exists between areas of NORMAL OPERATIONS and the edge of the outermost UNVENTED TRU WASTE DRUM in the ISOLATION AREA.

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(6) Banding

- TRU WASTE drums on stacked pallets in the storage array will be secured (e.g., banded).

(7) Sealed Radioactive Sources

- Sealed radioactive sources are part of an Area G source control policy that complies with the source control strategy specified in Article 431 of the DOE RadCon Manual, DOE/EH-0256T Radiological Control Manual, or successor document.

(8) Secure Transport

- TRU WASTE containers will be secured during transport by motorized vehicle (e.g., forklift or truck).

(9) Compressed gas cylinder handling

- Compressed gas cylinders will be stored in designated locations when not in use. Proper storage minimizes the potential for cylinders from becoming missiles or an explosion occurring that impacts waste.
- Compressed gas cylinders in storage, in TRANSPORT, or in use will be secured. Securing cylinders reduces the probability that a cylinder could fall over and rupture the nozzle.
- Compressed gas cylinders in storage will be closed with the valve cap secured. Closure of the valve prevents accumulation of flammable vapor which could lead to a vapor cloud explosion and the valve cap or guard prevents the nozzle from being ruptured or sheared creating a missile. Some compressed cylinders are designed with a guard in lieu of a valve cap to protect the nozzle. The valve guard was qualitatively determined to provide the same protection as a valve cap.

5.7 SPECIFIC ADMINISTRATIVE CONTROLS

The following Directive Action Specific Administrative Controls (SACs) apply when the applicable DEFINED AREAS are in OPERATION MODE or WARM STANDBY MODE. When the applicable DEFINED AREAS are in COLD STANDBY, no MAR inventory is present and the SAC is not applicable.

5.7.1 STATIONARY FIRE WATCH During Hot Work Control

Safety Function: The safety function of the hot work SAC is to reduce the likelihood for ignition of flammables/combustibles.

Control Description: Hot work activities in TRU WASTE STORAGE AREAS SHALL be monitored by a STATIONARY FIRE WATCH

Basis: *Some TRU WASTE in TA-54, Area G is contained in FRPs or other containers that are combustible. These containers are permitted to be stored in TRU non-METAL CONTAINER STORAGE AREAs that limit the radiological inventory (PE-Ci) of the area and therefore, protects the assumptions of the accident analysis and the derived consequences. Hot work activities (e.g., welding, grinding or cutting of metal, or other operations that produce sparks or flame) being performed in the TRU non-METAL*

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CONTAINER STORAGE AREAs have the potential to ignite a fire. Other areas where METAL CONTAINERS are stored may also require hot work activities. The fire watch in these areas reduces the probability that a hot work spark initiator may cause a fuel pool fire, if there is spilled fuel. To reduce the likelihood of a fire event, activities where hot work is to be performed within a TRU STORAGE AREA are identified. If hot work is to be performed, then a STATIONARY FIRE WATCH is assigned to observe the activity.

The STATIONARY FIRE WATCH provides stationed personnel for the purpose of making fire safety observations (e.g. presence of ignition sources, changes in combustible loading, unauthorized activities, and situations that could increase the potential or consequences of a fire). The STATIONARY FIRE WATCH is performed according to Laboratory policy.

5.7.2 Vehicle Refueling Prohibition

Safety Function: The safety function of this control is to reduce the likelihood of a fire from a refueling accident involving MAR on a TRANSPORTATION VEHICLE.

Control Description: The refueling of TRANSPORTATION VEHICLES is prohibited when MAR is on the TRANSPORTATION VEHICLE. This control does not apply to propane-fueled forklifts.

Basis: *The safety basis indicates that fuel pool fires involving TRU MAR result in significant dose consequences to all receptors. An accident involving a fuel leak during refueling with a subsequent spark, is identified in the safety basis as a significant fuel pool fire that can involve waste. The implementation of this control prevents the involvement of MAR in transport when TRANSPORTATION VEHICLES are being fueled. Propane fueled forklifts are exempted from this control because the propane within the fuel tanks on forklifts will not pool if spilled and, therefore, will not form a fuel pool as analyzed in the accident analysis.*

5.7.3 DOUBLEPACKING TRU WASTE Drums with MAR \geq 200 PE-Ci during Trenches A-D Retrieval Activities

Safety Function: The safety function is to reduce radiological consequences by limiting the amount of MAR affected by thermal or mechanical insults.

Control Description: TRU WASTE Drums \geq 200 PE-Ci retrieved from Trenches A through D SHALL be DOUBLEPACKED prior to retrieval of an additional TRU WASTE drum in the DEFINED AREA.

Basis: *Many drums that are currently stored in Trenches A through D are known to contain greater than 200 PE-Ci. These drums are not currently DOUBLEPACKED as required by LCO 3.1.7 for above-ground containers, and cannot be DOUBLEPACKED until they have been removed from the trench. Upon removal from an uncovered culvert, any drum with \geq 200 PE-Ci is DOUBLEPACKED before another drum is retrieved. Depending on the integrity of a retrieved drum with \geq 200 PE-Ci, DOUBLEPACKING may require the retrieved drum to be OVERPACKED with a single TRU WASTE container (if the retrieved drum itself is of sound integrity) or with two TRU WASTE successive containers (if the retrieved drum is not of sound integrity)*

Metal TRU WASTE containers with higher PE-Ci values that are DOUBLEPACKED provide a mitigative function by reducing the MAR involved in the event. This control addresses fire, deflagration, loss of confinement, external, and NPH events. Based upon the types of activities that may be conducted within

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an area (e.g., storage or processing) it was determined that limiting the quantity of radiological material that may be involved in any one process upset is an effective means for controlling the risk. With high MAR containers being DOUBLEPACKED, the material available for release is limited and, therefore, reduces the consequences to the public, collocated workers, and facility workers.

5.7.4 Escort of High MAR TRU WASTE TRANSPORT Within TA-54, Area G

Safety Function: An escorted rolling roadblock for the TRANSPORTATION VEHICLE reduces the likelihood for a vehicle accident involving radioactive waste and impact to stored radioactive waste containers.

Control Description: TRANSPORTATION VEHICLES, excluding forklifts, meeting or exceeding the following limits, SHALL be escorted by a rolling roadblock (i.e., escort vehicle in front and back):

1. Any TRANSPORTATION VEHICLE with COMPLIANT METAL CONTAINERS containing > 800 PE-Ci.
2. Any TRANSPORTATION VEHICLE with one or more non-COMPLIANT METAL CONTAINERS or non-METAL CONTAINERS > 450 PE-Ci.

Basis: *To reduce the risk associated with high MAR on a TRANSPORTATION VEHICLE, this control is implemented to escort the TRANSPORTATION VEHICLE with a rolling roadblock. A TRANSPORTATION VEHICLE with high MAR includes a vehicle with COMPLIANT METAL CONTAINERS with > 800 PE-Ci, or a vehicle with non-COMPLIANT METAL CONTAINERS or non-METAL CONTAINERS with > 450 PE-Ci. A rolling roadblock consists of an escort vehicle in front of and another behind the TRANSPORTATION VEHICLE. The escort minimizes the potential for another vehicle impacting the TRANSPORTATION VEHICLE with the high MAR and also ensures compliance with the 15-mph posted speed limit at which the TRANSPORTATION VEHICLE travels to minimize the potential for the TRANSPORTATION VEHICLE causing an accident.*

Designated routes of travel will be established and documented, and are required to be known by escort drivers. Due to the nature of TA-54, Area G operations and the need for various combinations of origination and destination points, designated routes may be modified and the changes evaluated through the Unreviewed Safety Question (USQ) program.

Transport vehicles that are operating under the LANL Transportation Safety Document are not subject to this control. Consistent with the interface between a nuclear facility at LANL and the LANL TSD, the TSD governs and applies during TRANSPORT along public roads and until the vehicle comes to a complete stop at the required location for unloading and receipt acceptance of a waste container at the Area G occurs.

5.7.5 Escort of TRANSPORTATION VEHICLE Between TA-54, Area G and RANT

Safety Function: The safety function of this control is to reduce the frequency of vehicle accidents resulting in fuel interaction with MAR during TRANSPORT of MAR between Area G and the Radioassay and Nondestructive Testing Facility (RANT) entrance gate.

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Control Description: TRANSPORTATION VEHICLES with MAR onboard SHALL be escorted by a rolling roadblock (i.e., escort vehicle in front and back) between TA-54, Area G and the RANT entrance gate.

Basis: The rolling roadblock escort for the TRANSPORTATION VEHICLE that is TRANSPORTING MAR between TA-54, Area G and RANT reduces the likelihood for a vehicle accident involving radioactive waste that has the potential for high consequences to the public. The rolling roadblock vehicle escort minimizes the potential of another vehicle impacting the TRANSPORTATION VEHICLE and ensures compliance with the posted speed limit to reduce the potential of causing an accident. This control is not required within the RANT boundary (i.e., RANT entrance gate). The escort is not required inside the RANT yard because the TRANSPORTATION VEHICLE is travelling at a low speed to turn into or out of the RANT yard.

5.7.6 Escort of > 100-Gal Flammable Liquid Inventory Vehicles Within TA-54, Area G

Safety Function: The safety function is to reduce the likelihood of fuel interaction with MAR during vehicle transports with greater than 100 gal of flammable liquid on board.

Control Description: Vehicles/Equipment in transit within Area G with > 100 gal total flammable liquid inventory SHALL be escorted and follow a designated route.

Basis: Controls on vehicles/equipment with greater than a total contained 100-gal fuel inventory (including the vehicle's fixed fuel tank capacity and any transported containers of flammable liquid) minimize the likelihood that an accidental fuel spill and fire would occur in the vicinity of MAR and result in a release of radiological material. Drivers with vehicles or equipment with the capacity to contain more than 100 gal may not be familiar with the TA-54, Area G site. The large-fuel-capacity vehicles/equipment that are required to pass near DEFINED AREAS containing MAR must be escorted along a designated route. The escort vehicle restricts the travel path and restricts vehicle/equipment speed to the posted speed limit so that the likelihood of a vehicle accident and fuel spill is limited.

Designated routes of travel will be established and documented, and are required to be known by escort drivers. Due to the nature of TA-54, Area G operations and the need for various combinations of origination and destination points, designated routes may be modified, and the changes evaluated through the Unreviewed Safety Question (USQ) program. When vehicles require access to LAAs, they often have to travel across unpaved ground, beyond the designated routes. Vehicles with > 100-gal flammable liquid inventory will be preceded by an escort vehicle, even when travel beyond the designated route is required to reach the LAAs.

5.7.7 RETRIEVAL AREA UNVENTED TRU WASTE DRUM Isolation Requirement and Stacking Prohibition

Safety Function: The safety functions of this control is to reduce the likelihood and radiological consequences of a sympathetic deflagration, and the likelihood of inadvertent unvented drum toppling and leading to a deflagration.

Control Description: After an UNVENTED TRU WASTE DRUM is removed from its underground storage configuration at a RETRIEVAL AREA, the UNVENTED TRU WASTE DRUM SHALL not be stacked, and SHALL be inserted into an OVERPACK/ DOUBLEPACK IMMEDIATELY, or placed in an ISOLATION AREA until inserted into an OVERPACK/ DOUBLEPACK, or until a lid restraint is

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applied for its transfer to an ISOLATION AREA within the above-ground STORAGE AREA, or the drum is VENTED.

***Basis:** At Pit 9, an UNVENTED TRU WASTE DRUM is removed from its underground storage configuration after it has been physically removed from its position in the uncovered stacked, storage array. At Trenches A-D, an UNVENTED TRU WASTE DRUM is removed from its underground storage configuration after it has been physically removed from its position within the cask.*

At the RETRIEVAL AREA, not permitting UNVENTED TRU WASTE DRUMS to be stacked prevents sympathetic deflagrations from occurring and prevents an UNVENTED TRU WASTE DRUM from toppling from an upper tier. An UNVENTED TRU WASTE DRUM can deflagrate if mechanically insulted or toppled from a stack. Prohibiting the stacking of UNVENTED TRU WASTE DRUMS prevents sympathetic deflagrations and reduces the likelihood for an UNVENTED TRU WASTE DRUM to be toppled leading to a deflagration. The isolation of UNVENTED TRU WASTE DRUMS within a limited-activity area reduces the likelihood for an UNVENTED TRU WASTE DRUM to be inadvertently impacted by nearby work activities (e.g., forklift operations).

Isolating and not stacking UNVENTED TRU WASTE DRUMS provide for the safe storage of the containers until they are passively vented or OVERPACKED/DOUBLEPACKED, or lid restraint applied. This SAC is necessary to provide administrative compensatory measures while the containers are in an unvented condition.

5.7.8 Elevated Waste Movements and Critical Lifts

Safety Function: The safety function of the elevated waste movements and critical lift requirements is to reduce the frequency for container puncture, drops, toppling, and impacts resulting in release of radiological material.

Control Description:

1. A spotter SHALL be present for TRU WASTE container lifts planned to exceed 4 ft above the ground surface directly below the TRU WASTE container, but less than or equal to 12 ft lift height above the ground surface directly below the TRU WASTE container.
2. A critical lift plan SHALL be used for planned lifts of the TRU WASTE container > 12 ft above the ground surface directly below the TRU WASTE container.
3. A critical lift plan SHALL be used for planned lifts of FRPs with MAR > 150 PE-Ci.

***Basis:** A control is in place for a spotter to be present for TRU WASTE container lifts planned to exceed 4 ft above the ground surface directly below the TRU WASTE container but less than or equal to 12 ft lift height. This control ensures a spotter is present for lift operations during elevated (e.g., stacking/unstacking, loading/unloading) placement/removal of TRU WASTE containers.*

Use of a spotter for anticipated lift heights greater than 4 ft above the ground surface directly below the TRU WASTE container helps to direct the vehicle/equipment operator around obstructions and prevent drops, punctures and impacts with TRU WASTE containers.

Lifting of TRU WASTE containers is required during various receipt, retrieval, handling, examination, and shipping activities. Lifts of greater than 12 ft have the potential to result in significant damage to the

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lifted container if dropped. The minimum lift height requiring a critical lift is set at 12 ft because DOE-STD-5506 evaluates drops from the 4th tier of stacked drums (nominally 12 ft) to be low impact and to result in a damage ratio of 0.1 or less [Refs 16, 17]. Therefore, lifts of containers where the minimum drop height (e.g., distance between lowest point on container and the first surface immediately below the container) is expected to exceed 12 ft are planned to reduce the likelihood of a container drop. Planning of these lifts provides assurance that potential obstructions within the load path are minimized, that lifting equipment is inspected and in proper working condition, and that the load is properly rigged. This planning reduces the likelihood for a container drop. This SAC requires the preparation and approval of a critical lift plan for lifts of greater than 12 ft in height.

The accident analysis indicates that the drop of an FRP with MAR > 150 PE-Ci will result in dose consequences to the public that are Moderate. The critical lift plan associated with lifting drums is not based on a MAR limit.

The critical lift plan ensures that the equipment used is authorized for the load lifted, equipment is maintained, and operators are trained and qualified for the equipment they use to perform the lifts. A critical lift plan for planned crane lifts of TRU WASTE loads and FRPs reduces the likelihood of load drops, thereby preventing potential TRU WASTE container or FRP breaches or spills.

5.7.9 Mobile Loading Payload Lifts

Safety Function: The safety function of this control is to prevent a mobile loading payload from dropping on top of another payload or a DEFINED AREA containing TRU WASTE and to prevent high MAR payload drop, to minimize consequences by limiting the MAR involved in the accident. Limiting the MAR for high elevation lifts limits the consequences of payload drop.

Control Description:

1. Mobile loading payloads SHALL not be lifted over TRU WASTE, excluding another payload within the Type B container.
2. Mobile loading payloads with MAR > 925 PE-Ci SHALL not be lifted more than 12 ft, measured from the bottom of the payload to the ground.

Basis: *The accident analysis indicates that a payload drop onto another payload, or the drop of payloads with MAR above 925 PE-Ci, could result in unacceptably high consequences to receptors. This lift control mitigates consequences to only involve a release those from the dropped payload, and not from the impact of other TRU WASTE containers. A payload that is inside a Type B container is protected from an impact-related material release. A 12 ft limit was selected as the height restriction for High MAR payloads because the minimum lift height requiring a critical lift is set at >12 ft. DOE-STD-5506 evaluates drop drops from the 4th tier of stacked drums (nominally 12 ft) to be low impact and to result in a damage ratio of 0.1 or less [Refs 16, 17].*

5.7.10 Projected Above Ground Inventory

Safety Function: This control protects the assumptions of the inventory statistical analysis used in the Area G BIO accident analysis.

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Control Description: VERIFY that projected Area G above-ground inventory statistics results in an inventory that is bounded by the approved hazard and accident analysis prior to underground TRU WASTE retrieval activities at Trenches A-D.

Basis: The Area G BIO used a statistical approach per guidance in DOE-STD-5506. The retrieval of underground waste from Trenches A-D may skew the 2013 inventory statistics because several of the Trenches A-D drums have MAR values greater than 200 PE-Ci and are of a 100% combustible waste matrix.

The implementation of this SAC will ensure that the hazard and accident analysis bounds current and/or forecasted inventories due to Trenches A-D retrievals.

The projected above-ground inventory will be based on anticipated shipments of TRU WASTE containers to WIPP from Area G, anticipated newly generated waste based on the most recent year's receipt of TRU WASTE containers from LANL generators of nuclear waste, and the identified Trenches A-D drums that are planned to be retrieved. Once the projected above-ground inventory is generated, a DOE-STD-5506 statistical analysis will evaluate the maximum container MAR in a drum, the 99th percentile value, the 95th percentile value, the mean value of the container MAR, and the waste matrix distribution. An allowable projected inventory is if the evaluated quantities in the statistical analysis are less than analyzed in Table 3-14, in Chapter 3 of the Area G BIO. If any of these values are higher than those in Chapter 3, Table 3-14, then these values are used in spreadsheet calculations to determine if the dose consequences for bounding accidents are less than those in Section 3.4 of the Area G BIO. If the dose consequences are higher than those analyzed in the Area G BIO, then the projected inventory to be retrieved must be adjusted for the Trenches A-D. If the dose consequences are equal to or lower than those analyzed in the Area G BIO, then the projected retrieval plan may be carried out.

5.7.11 Pole-Mounted Transformer Distance from TRU WASTE STORAGE AREAS

Safety Function: The safety function of this SAC is to preserve the initial conditions in the accident analysis that post-seismic fire will not involve TRU WASTE STORAGE AREAS and reduces the likelihood of post-seismic fire in TRU WASTE STORAGE AREAS caused by pole-mounted transformer falling onto waste containers during a seismic event.

Control Description: Pole-mounted transformers SHALL be located a safe distance away from TRU WASTE STORAGE AREAS as determined by the height of the pole-mounted transformers. If the pole-mounted transformer contains flammable/combustible liquids (i.e., with a flammability rating greater than 1), the safe distance is the height of the transformer, the radius of the fuel pool based on the volume of the fuel within the transformer, and a thermal separation distance, to protect the TRU WASTE STORAGE AREAS. Alternatively, a LIQUID IMPEDIMENT, capable of preventing the run on of liquid equal to the volume of the fluid within the transformer, may be used between the potential location of the downed transformer and the TRU WASTE STORAGE AREA.

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Basis: *The accident analysis for a seismic event and post-seismic fire presumes that a pole-mounted transformer will not topple onto a TRU WASTE STORAGE AREA, causing spilled flammable liquid contents to ignite. If the transformer catches on fire after falling, an ensuing fuel pool fire may be sufficient to propagate a fire within the TRU WASTE STORAGE AREA resulting in high consequences. This control protects the assumption of this analysis.*

This control does not apply to pad-mounted or floor-mounted transformers, as these do not present the same seismic toppling concern as elevated, pole mounted transformers. The control also does not apply to transformers containing only Class IIIB combustible liquid. Such liquids have a National Fire Protection Association (NFPA) 704 Flammability Rating of 0 or 1, or (if a Flammability Rating is not available for a particular liquid), have a flashpoint of 200 °F or higher. These liquids require considerable preheating under all ambient temperature conditions, before ignition and combustion can occur. Transformer liquids of this type will not start a fire, do not present the same fire hazard as flammable/combustible liquids with a lower flash point temperature, and are not subject to this control.

This control is implemented through an evaluation to determine the required separation distance and/or LIQUID IMPEDIMENT between pole-mounted transformers and TRU WASTE STORAGE AREAS.

5.7.12 Prohibitions on Opening Sealed Inner TRU WASTE Packages Discovered within a TRU WASTE Container During SSSR Activities

Safety Function: During SSSR activities, a prohibition on opening sealed inner TRU WASTE packages protects workers from significant injury due to a possible deflagration as a result of a flammable gas concentration in sealed inner TRU WASTE packages.

Control Description: Sealed inner TRU WASTE packages found within a parent TRU WASTE container during SSSR activities SHALL not be opened except as allowed by SAC 5.7.18.

Sealed inner TRU WASTE packages contain TRU WASTE and are

- Metal or glass containers with a
 - positive mechanical locking mechanism such as a metal screw-on lid; or,
 - a metal locking, bolted, or snap-on lid.

The following inner package types, regardless of volume, may be remediated during SSSR because there is no concern for hydrogen build-up within the package:

- any plastic container with any lid;
- any container with a plastic lid;
- any container without a gasket (e.g., containers with slip lids, paint cans, and other similar containers of any volume);
- any container with a slip-on lid (with or without a gasket);
- any container that does not contain TRU WASTE; and,
- fiber board containers of any volume.

Basis: *Sealed inner TRU WASTE packages that are metal or glass and have metal lids, as indicated above, are not to be opened during SSSR activities. This prevents the worker from being exposed to a deflagration hazard due to a build-up of a flammable (hydrogen) gas mixture within the waste package. The prohibition is an important assumption of the hazard evaluation. To protect this assumption in the*

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hazard evaluation, the prohibition on opening sealed inner TRU WASTE packages is a specific administrative control for worker protection. During waste remediation, several other types of inner packages have been encountered and are not subject to hydrogen build-up. These inner packages, as listed above, are not sealed or do not contain TRU WASTE, so the build-up of a flammable gas mixture is not feasible. Hydrogen bounce-back studies at Savannah River Site indicate that hydrogen will diffuse through plastic, thus supporting the concept that any plastic container with any lid, or any container with a plastic lid will not build up hydrogen (Ref. 19). An exception to the SAC is allowed for the opening of sealed containers with bolted lids/flanges as covered by SAC 5.7.18.

5.7.13 Acetylene Cylinder Control

Safety Function: The control reduces the likelihood of an acetylene cylinder explosion that involves MAR. It is a safety class equivalent specific administrative control.

Control Description: The storage or use of acetylene cylinders is prohibited inside or within 50-feet of DEFINED AREAS where MAR is present.

Basis: *Acetylene cylinders create a unique explosion hazard due to the potential for flashback through connected torches or regulators into the cylinder. Acetylene cylinders can also represent a potential hazard when improperly stored because they may be more vulnerable to physical insults or other sources of energy which could cause a cylinder breach and explosion. As such, the storage or use of acetylene cylinders in DEFINED AREAS where MAR is present or within 50 feet of those DEFINED AREAS is prohibited. A 50-foot standoff from DEFINED AREAS is a requirement of this SAC because the distance bounds the most conservative thermal separation distance from any type of waste container (i.e., metal or non-metal) established by the safety analysis as developed in LANL calculation SB-DO:CALC-11-014, "Calculation for Radiant Energy at a Distance Away from Object for Ordinary Combustibles and Pool Fires (Ref. 27), and specified in LCO 3.2.1. Reference 27 determined that a safe separation distance of 42.8-feet was required for a pool fire involving ≤ 100 gallons of flammable liquid (diesel fuel and gasoline were considered) in order to prevent a heat flux of $> 10 \text{ KW/m}^2$ to a non-metal container. The 50-foot standoff distance beyond the DEFINED AREA is well in excess of that necessary to prevent crushing overpressure of waste containers due to explosion, and also sufficient to ensure radiant energy from an acetylene explosion and fire will not cause a release of MAR from a metal or non-metal container stored nearby (i.e., it exceeds applicable Thermal Separation Distance requirements). Due to their infrequent use at Area G, and the standard industry practice of storing compressed gas cylinders in designated areas away from other hazards, the control of acetylene cylinders through this SAC provides acceptable mitigation of the hazard without requiring specific performance criteria or surveillance requirements.*

5.7.14 Non-Sparking Equipment/Process During Venting

Safety Function: The use of non-sparking equipment/ processes when penetrating the lid of an UNVENTED TRU WASTE DRUM, during its venting, reduces the likelihood of a deflagration by reducing the likelihood of a mechanically-induced (frictional) spark that could ignite a flammable gas mixture that may exist within the UNVENTED TRU WASTE DRUM.

Control Description: The equipment or process used to penetrate the lid of an UNVENTED TRU WASTE DRUM must be of the type that does not produce mechanically-induced sparks. A vented 55-gallon, 85-gallon, or 110-gallon TRU WASTE drum that contains an unvented inner drum is considered an UNVENTED DRUM for the purposes of this SAC.

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Basis: During the venting process, there is a potential to ignite flammable gases within the unvented drum, resulting in a deflagration with ejection of debris. When penetrating the lid of an UNVENTED TRU WASTE DRUM, during its venting, the equipment/process used must be of the type to minimize generation of a mechanical spark (e.g., non-sparking tools; use cold drilling, controlled speed drilling, or drum punch). By their use, the likelihood of a spark occurring is minimized. Preventing the occurrence of sparks will minimize the likelihood that a flammable gas mixture can ignite within the UNVENTED TRU WASTE DRUM, and lead to a deflagration. For the Nuclear Filter Technology Drum Venting System, the drill speed must be below 640 rpm. The use of rotational drill speeds below 640 rpm has been determined to meet the safety function (Ref. 26). The BIO credits this control for reducing the frequency of a deflagration during venting. Due to their widespread industrial use, non-sparking tools are procured, installed, and maintained in accordance with standard industrial practices applied to such devices; their management through the SAC provides acceptable mitigation of the hazard without requiring specific performance or quality criteria for those devices.

5.7.15 Blast-Mitigation Device During Venting

Safety Function: The use of a blast-mitigation device during venting reduces the potential radiological consequences to all potential receptors in the event of a deflagration during the venting of an UNVENTED TRU WASTE DRUM.

Control Description: An UNVENTED TRU WASTE DRUM with $MAR \leq 480$ PE-Ci EQUIVALENT COMBUSTIBLE WASTE SHALL use a blast-mitigation device (e.g., DOUBLEPACK, DVS enclosure or lid restraint). An UNVENTED TRU WASTE DRUM with $MAR > 480$ PE-Ci EQUIVALENT COMBUSTIBLE WASTE SHALL use a DOUBLEPACK as a blast-mitigation device. A vented 55-gallon, 85-gallon, or 110 gallon TRU WASTE drum that contains an unvented inner drum is considered an UNVENTED TRU WASTE DRUM for the purposes of this SAC.

Basis: A blast-mitigation device such as a DOUBLEPACK, DVS enclosure, or lid restraint protects against lid loss, thus mitigating dose consequences. For UNVENTED TRU WASTE DRUMS with $MAR \leq 480$ PE-Ci EQUIVALENT COMBUSTIBLE WASTE, the BIO credits the use of blast mitigation devices as safety-significant. The blast mitigation devices are used to lower the $ARF \cdot RF$ from that of unconfined burning to one of confined burning.

Section 4.4.3.1 of DOE-STD-5506 describes confined and unconfined burning. Confined burning is defined as burning of MAR inside a drum that has lost the seal and/or the lid. DOE-STD-5506 refers to DOE-HDBK-3010-94 which states that even waste placed together in a pile without bag containment forms a loosely agglomerate package of sorts. DOE-STD-5506 concludes: "Therefore, combustion of TRU wastes that is contained in drums or boxes, meets the definition of packaged waste, even when these containers have suffered lid degradation or loss." In fact, the derivation of the ARF and RF for confined burning, in section 5.2.1.1 of DOE-HDK-3010, Vol. 1, is based on results from waste contained in a cardboard box. The descriptions within DOE-STD-5506 and the DOE-HDBK-3010 confirm that measures that prevent the waste from being ejected, will provide confined burning.

For UNVENTED TRU WASTE DRUMS with $MAR > 480$ PE-Ci EQUIVALENT COMBUSTIBLE WASTE, the BIO credits the use of a DOUBLEPACK as a safety-class control to reduce the Damage Ratio and thus the source term by a factor of 10 ($DR = 0.1$) in addition to the reduction in $ARF \cdot RF$ described above for confined burning. A DOUBLEPACK consists of a container of sound integrity overpacked by a second outer container of sound integrity. DOE-STD-5506 provides an inspection checklist for use in determining if a container is of sound integrity. However, for the purpose of using the

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DR for a DOUBLEPACK involved in a deflagration, an inner container capable of retaining hydrogen may be judged to be of sound integrity without inspection. If the container is not of sound integrity, no hydrogen is retained and the deflagration hazard is eliminated. Therefore, the assumption of sound integrity is conservative. As a result, the sound integrity of an unvented inner container does not need to be confirmed by inspection for the purpose of applying the definition of a DOUBLEPACK to a venting operation.

It is acceptable to use more than one blast-mitigation device (e.g., a lid-restraint on the drum that is then vented within the drum venting system chamber), as long as the device whose use is credited with consequence reduction meets the associated performance and quality requirements. The use of an additional blast-mitigation device may provide further defense-in-depth, but is not credited in the accident analysis, and is not required to meet the same requirements as the credited device. Due to their widespread industrial use, the blast-mitigation devices are procured, installed, and maintained in accordance with standard industrial practices applied to such devices; their management through the SAC provides acceptable mitigation of the hazard without requiring specific performance or quality criteria for those devices.

5.7.16 Standoff During Venting

Safety Function: The control reduces the potential consequences to facility workers in the event of a drum deflagration.

Control Description: Personnel SHALL be located ≥ 30 ft from the UNVENTED TRU WASTE DRUM while it is being vented.

Basis: *The 30 ft (radius) standoff distance serves two worker protection functions in the event of a deflagration during drum venting: 1) it helps to limit the potential inhaled radiation dose rate for facility workers (as derived in Appendix 3I of the BIO), and 2) it protects workers from serious injury from the blast wave (as derived in CALC-11-TA-54-AREAG-010).*

Personnel necessarily must be within 30 ft of the drum prior to venting (e.g., set-up of drum in venting apparatus), but must maintain the ≥ 30 ft standoff distance during the venting. This standoff distance, in conjunction with a radiological contamination control environment (element of the Radiation Protection Program), provides a means to minimize the worker from being impacted by flying debris and limits the amount of radiological material available for uptake.

Since the deflagration hazard only exists during the actual venting (puncture), this control is only applicable during venting (e.g., activities such as setting up the drum do not have the potential to puncture the drum and therefore the subsequent deflagration hazard does not exist, and the control is not applicable).

5.7.17 STATIONARY FIRE WATCH During SSSR Activities

Safety Function: The safety function of the STATIONARY FIRE WATCH During SSSR Activities SAC is to reduce the consequences of fire.

Control Description: A continuous STATIONARY FIRE WATCH is required in the SSSR process area whenever TRU WASTE is exposed.

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Basis: SSSR processes involve the handling of combustible material. The STATIONARY FIRE WATCH is a trained individual equipped with fire blankets, Metal X, and ABC fire extinguishers, as appropriate, to extinguish an incipient fire. Because the STATIONARY FIRE WATCH is located in the process area and is dedicated to prevent or extinguish a fire, the consequences from an incipient fire involving exposed TRU WASTE are significantly reduced. The STATIONARY FIRE WATCH is continuous and required whenever TRU WASTE is exposed in an SSSR process area.

TRU WASTE outside of a container is considered exposed. TRU WASTE covered by a fire blanket or other fire retardant material is sufficiently protected from a potential fire and is not considered exposed.

5.7.18 Controls for Opening Sealed Containers with Bolted Lids/Flanges During SSSR Activities

Safety Function: The safety function of this SAC is to reduce the likelihood and consequence of a deflagration.

Control Description: Sealed containers with bolted lids/flanges may be opened in the SSSR AREA provided that:

1. Spark-generating operations in the SSSR AREA SHALL cease prior to loosening the lid/flange bolts.
Basis: Stopping all spark-generating operations removes an initiator for deflagration.
2. Workers and the sealed container SHALL be grounded or bonded prior to loosening the lid/flange bolts.
Basis: All workers in the immediate vicinity of the container SHALL be grounded or bonded until measurements demonstrate that the hydrogen levels at the openings are below the LFL for hydrogen. The safety function of the grounding or bonding is to reduce the probability for a spark during the opening of a sealed container and as the container is venting, thereby minimizing the potential for igniting a potentially flammable atmosphere. Once the hydrogen levels at the openings are measured and demonstrated to be below the LFL (4% for hydrogen), the grounding or bonding is no longer required.
3. Loosening the lid/flange bolts SHALL be performed using non-sparking processes or tools.
Basis: The use of non-sparking processes or tools prevents the occurrence of sparks, thereby preventing the ignition of a potentially flammable atmosphere.
4. The lid/flange bolts of each lid/flange SHALL be loosened sufficiently to break the seal on the lid/flange and allow venting without completely removing the bolts.
Basis: The bolts SHALL be loosened sufficiently to break the seals and allow venting of hydrogen while maintaining sufficient thread engagement to ensure lid restraint to prevent worker injury from an energetic lid loss in the event of a hydrogen deflagration.
5. The container SHALL be positioned such that the opening(s) is at the high point of the container.
Basis: The opening must be at the high point of the container for venting of hydrogen to be effective.
6. Spark-generating operations SHALL not be resumed until the container has vented and the hydrogen levels at the openings are measured and demonstrated to be below the LFL (4% for hydrogen).
Basis: If measurements at the container openings demonstrate that the hydrogen levels are below the LFL, spark-generating operations may be resumed. The requirement that the hydrogen levels are

5.0 ADMINISTRATIVE CONTROLS

measured and demonstrated to be below the LFL before resuming spark-generating operations ensures that deflagration is not a potential.

5.8 OCCURRENCE REPORTING

An occurrence reporting program is established, implemented, and maintained for reporting operational occurrences. Occurrence reports will be prepared in accordance with LANL requirements. This program satisfies the requirements of DOE M 232.1 2, Occurrence Reporting and Processing of Operations Information, in reporting operations information. Investigations of occurrences having environmental protection, safety, or health-protection significance are performed in compliance with DOE O 225.1B, Accident Investigation.

5.9 TRAINING AND QUALIFICATION

The TA-54, Area G site training and qualification program is established, implemented, and maintained in accordance with Laboratory requirements (P 781-1, or successor document). The program ensures that personnel who are responsible for the TA-54, Area G site operations, building/facility operations, process operations, vehicle operation, maintenance, and technical support are trained and qualified/certified, as applicable, to accomplish their safety-related responsibilities. Line management ensures that personnel receive the training required. The training program includes the following elements:

1. Personnel maintain applicable LANL qualifications for vehicle and equipment operation.
2. Personnel are trained to recognize specific job hazards and associated controls.

5.10 DOCUMENT CONTROL

TA-54, Area G site operations and facility records (including TSR compliance documentation) SHALL be retained in accordance with LANL requirements (P-1020-1, or successor document).

5.11 REFERENCES

1. SB 112-3, *Unreviewed Safety Question (USQ) Process*, Los Alamos National Laboratory, Los Alamos, NM
2. PD 1200-1, *Emergency Management*, Los Alamos National Laboratory, Los Alamos, NM
3. SD-130, *Nuclear Criticality Program*, Los Alamos National Laboratory, Los Alamos, NM
4. PD 1220, *Fire Protection Program*, Los Alamos National Laboratory, Los Alamos, NM
5. P 121, *Radiation Protection*, Los Alamos National Laboratory, Los Alamos, NM
6. DOE O 433.1B, *Maintenance Management Program for DOE Nuclear Facilities*, U.S. Department of Energy, Washington DC
7. P 950, *Conduct of Maintenance*, Los Alamos National Laboratory, Los Alamos, NM
8. PD 341, *Engineering Processes Manual*, Los Alamos National Laboratory, Los Alamos, NM

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9. SD 330, *Quality Assurance Program*, Los Alamos National Laboratory, Los Alamos, NM
10. P 315, *Conduct of Operations Manual*, Los Alamos National Laboratory, Los Alamos NM
11. SD 400, *Environmental Management System Description Document*, Los Alamos National Laboratory, Los Alamos NM
12. P 101-14, *Chemical Management*, Los Alamos National Laboratory, Los Alamos, NM
13. P 101-34, *Pressure Safety*, Los Alamos National Laboratory, Los Alamos, NM
14. P 409, *Waste Management*, Los Alamos National Laboratory, Los Alamos, NM
15. P 930-1 *Waste Acceptance Criteria*, Los Alamos National Laboratory, Los Alamos, NM
16. DOE-STD-5506, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities*, U.S. Department of Energy, Washington DC, April 2007.
17. AD-NHHO-10-373, *Submittal of Justification for Page Changes to Modify Section 5.6.8.1 Drum Drop-Height and Handling-Limits Specific Administrative Controls, Rev.1*, Los Alamos National Laboratories, December 2010.
18. NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, National Fire Protection Association, Washington DC
19. WSRC-SA-22, R9, *Savannah River Site Solid Waste Management Facility Documented Safety Analysis*, prepared by Washington Safety Management Solutions, Aiken SC, December 2007.
20. CALC-11-TA-54-AREAG-010, *Blast Overpressure Calculation from a DOT 7A Type A 55-gallon and 85-gallon Transuranic (TRU) Drum Explosion*, Los Alamos National Laboratory, Los Alamos, NM, June 2011
21. DOE M 232.1-2, *Occurrence Reporting and Processing of Operations Information*, U.S. Department of Energy, Washington DC
22. DOE O 225.1B, *Accident Investigation*, U.S. Department of Energy, Washington DC
23. P 781-1, *Conduct of Training Manual*, Los Alamos National Laboratory, Los Alamos, NM
24. P 1020-1, *Laboratory Records Management*, Los Alamos National Laboratory, Los Alamos NM
25. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, Waste Isolation Pilot Plant, Carlsbad, NM, April 2013
26. AREAG-CALC-00224, Rev. 2, *DVS Cold Drilling Assessment*, Los Alamos National Laboratory, Los Alamos, NM, November, 2012

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27. SB-DO:CALC-11-014, R1, *Calculation for Radiant Energy at a Distance Away from Object for "Ordinary" Combustibles and Pool Fires*, Los Alamos National Laboratory, Los Alamos, NM, August 2011

6.0 DESIGN FEATURES

SECTION 6.0 DESIGN FEATURES

6.0 DESIGN FEATURES

The purpose of the design features (DFs) section is to describe engineered safety features not covered elsewhere in the TSRs that, if altered or modified, would have a significant effect on safety. The following two areas are addressed in this section:

- DF performance criteria
- MODE/Area Applicability
- ISI ACTIONs and FREQUENCIES

The ISI is used to ensure compliance with the performance criteria, functional requirements, and safety functions identified for the SSC. The following generic issues are applicable to the ISI of DFs in this TSR:

1. FREQUENCY requirements for the ISI are identified for each DF (SSC).
2. A 25% extension of the interval specified in the FREQUENCY is allowed to facilitate ISI scheduling and considers facility operating conditions that may not be suitable for conducting the ISI (e.g., transient conditions or other on-going surveillance or maintenance activities). This extension is not intended to be used repeatedly as an operational convenience to extend ISI FREQUENCY intervals beyond those specified.
3. If an ISI determines that a DF does not meet its performance criteria, functional requirements, or safety function, that failure is new information, which SHALL be evaluated for initiation of the PISA process.
4. ISIs do not have to be performed on DFs that are out of service or otherwise not required by the TSRs.

6.1 SAFETY-CLASS DESIGN FEATURES

6.1.1 Vehicle Barriers at HIGH RISK LOCATIONS

The vehicle barriers prevent a vehicle impact with TRU WASTE at HIGH RISK LOCATIONS, and mitigate the consequences if a loaded TRANSPORTATION VEHICLE is prevented from impacting additional TRU WASTE at a HIGH RISK LOCATION.

The performance criterion for the vehicle barriers are as follows:

1. At HIGH RISK LOCATIONS at TA-54, Area G, the vehicle barrier system (e.g., concrete barriers or alternate design) must be capable of stopping a vehicle (moving at a velocity less than or equal to 15 mph) with a gross weight less than or equal to 150,000 lb and an impact height of less than 40 in.
2. The barrier system must be placed to ensure that the final position of the barrier, after displacement/movement due to impact, will remain at or beyond the required thermal separation distance for the DEFINED AREA at a HIGH-RISK LOCATION.

When vehicle barriers at a HIGH RISK LOCATION require relocation, repair, or maintenance, access to the road approaching the HIGH RISK LOCATION will be restricted so that no vehicle can make a

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perpendicular approach toward the DEFINED AREA that is being protected. While the road closure is in effect, the DEFINED AREA is not at high risk of vehicle impact.

Applicability: The vehicle barriers are required to meet the performance criteria when the DEFINED AREA at the HIGH RISK LOCATION being protected is in OPERATION or WARM STANDBY MODE.

ISI ACTIONs and FREQUENCIES are as follows:

IN-SERVICE INSPECTIONS	FREQUENCY
1. The physical integrity of the vehicle barrier system SHALL be inspected to identify any abnormalities (e.g., component deterioration, loose connectors, corrosion, cracks) which may prevent the system from performing its safety function.	Annually
2. The barrier system must be placed to ensure that the final position of the barrier, after displacement/movement due to impact, will remain at or beyond the required thermal separation distance for the DEFINED AREA at a high-risk location.	Annually AND Before changes to designated routes are implemented and before establishing new DEFINED AREAS
3. Designated routes SHALL be reviewed to ensure that vehicle barriers are present at HIGH RISK LOCATIONS.	Annually AND Before changes to designated routes are implemented and before establishing new DEFINED AREAS

Basis:

Vehicle barriers at HIGH RISK LOCATIONS at TA-54, Area G are designated as safety-class SSCs based on their ability to prevent direct impacts between moving vehicles and TRU WASTE containers at Area G. They also limit the amount of MAR involved to that on a TRANSPORTATION VEHICLE, if they prevent a loaded TRANSPORTATION VEHICLE from impacting additional MAR within a DEFINED AREA.

6.1.2 Pipe Overpack Containers

Pipe Overpack Containers (POCs) provide primary containment for high activity waste material and mitigate releases of the radioactive material when the container is subjected to mechanical or thermal stresses from postulated accidents.

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The performance criterion for the Pipe Overpack Containers is:

- 1) Pipe Overpack meets Waste Isolation Pilot Plant (WIPP) waste acceptance criteria for criticality control, shielding, and containment of waste material.

Applicability: The POCs are required to meet the performance criteria when they contain MAR.

ISI ACTIONs and FREQUENCIES are as follows:

IN-SERVICE INSPECTIONS	FREQUENCY
VERIFY Pipe Overpack is procured to meet WIPP criteria.	Prior to loading MAR into a POC.

Basis:

POCs are robust engineered containers. The capability of the pipe components to maintain structural integrity during the evaluated accident scenarios is due to the design and material construction of the POC. DOE Standard 5506 cites several studies of POCs under various accident conditions. For spill scenarios, POCs containing TRU WASTE material are vulnerable only to drops/falls from a distance of greater than 30 ft, structural collapse of substantial construction facilities where falling structural concrete slabs impact POCs such as seismic collapse, and puncture by forklift tines. The POC was determined by finite element modeling to be vulnerable to the forklift tine puncture due to the chisel design assumption and very small impact area. For the concrete slab and forklift tine puncture, a damage ratio (DR)=0.1 is assigned. Stacked POCs could be toppled due to a forklift collision. The POCs would be expected to withstand the impact associated with the toppling of stacks of POCs, as the distance to fall is much less than 30 ft. Due to the fiberboard material fill in the POC, the robust design of the Schedule 20 or 40 inner pipe, and the POC drop test performance, no release is expected from a cylinder missile impact, or from tornado/wind-generated missiles. For thermal insults, DOE Standard 5506 cites that the POCs are designed in a manner that precludes their failure during expected STORAGE AREA fire, and that POCs involved in storage and room fires need not be further evaluated in an accident analysis. In the Sandia National Laboratory study cited in DOE-STD-5506, of POCs subjected to an engulfing pool fire test, four POCs were placed on an open support stand with one meter spacing between them in a square array. The bottom of the units was one meter above the surface of a 10 m² pool of jet fuel floating on top of a layer of water at the pool fire test facility at SNL. The fuel was replenished so the fire duration was 30 minutes. This type of fire test generally results in flame temperatures between 800°C and 1100°C. For the POCs subjected to fuel pool fires, the cited studies indicate that losses due to thermal stresses are negligible. For conservatism, a DR=0.1 is assigned for these accidents.

The verification of the procurement to meet WIPP criteria (i.e., for criticality control, shielding, and containment of waste material) SHALL be done prior to loading MAR into the POC.

Reference:

1. DOE/WIPP-02-3122, *Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant*, Waste Isolation Pilot Plant, Carlsbad, NM, June 2011, or successor document.

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6.1.3 Type B Containers

Type B containers are robust transportation containers designed to withstand accident conditions without releasing radioactive material. The containers' specific performance criteria are documented in a Safety Analysis Report for packaging.

Applicability: Type B containers are required to meet their performance criteria when they are sealed, with radioactive waste inside.

IN-SERVICE INSPECTIONS	FREQUENCY
VERIFY that Type B containers have a current inspection sticker or documentation of compliance provided by the manufacturer.	Prior to the loading of MAR into a Type B container

Basis:

The accident analysis assumes a Radiological Inventory Control that specifies the radioactive waste material limits for Area G and administratively monitors the amount of radiological inventory within each area to ensure that its limit is not exceeded. This control is credited for fire, explosion, loss of confinement/containment, external, and NPH events. As allowed by DOE-STD-1027, radioactive waste in a sealed Type B container is not included in the radiological inventory. These containers, properly assembled, ensure that their contents are not MAR for postulated accidents.

Because Type B containers are either government-supplied equipment (e.g., TRUPACT II or HalfPACT) or commercially supplied equipment (e.g., Model 10-160B), the verification of the performance criteria for these containers is the responsibility of another entity. Ensuring that the containers have a current inspection sticker (or comparable documentation) provides evidence that the containers meet the conditions of their current Certificate of Compliance and their Safety Analysis Report for packaging, and will perform their safety function as intended.

6.0 DESIGN FEATURES

6.2 SAFETY-SIGNIFICANT DESIGN FEATURES

6.2.1 TRU WASTE CONTAINERS

TRU WASTE in COMPLIANT METAL CONTAINERS (as discussed in BIO Chapter 2) is packaged waste in structurally sound, noncombustible containers except as permitted in SSSR DEFINED AREA or waste packaged in non-METAL CONTAINERS. TRU WASTE in non-METAL CONTAINERS is also packaged waste, though the container may be constructed of combustible material.

The performance criteria for the TRU WASTE containers are as follows:

6.2.1.1 Structurally Sound

COMPLIANT TRU WASTE METAL CONTAINERS with sound integrity reduce the consequences and probability of mechanical effects to confined waste due to impact and spill events. A COMPLIANT TRU WASTE METAL CONTAINER is demonstrated to be of sound integrity based on the Hazardous Material and Waste Management Program inspection criteria (see TSR Section 5.6.11(2)(a)).

6.2.1.2 TRU WASTE Packaging

TRU WASTE is packaged to ensure that waste is agglomerated and burns as packaged waste, consistent with the criteria in DOE-HDBK-3010-94. TRU WASTE being packaged supports application of the airborne release fractions (ARFs), respirable fractions, and DRs assumed in the accident analyses of fire events

Packaging of contaminated, combustible waste includes relatively substantial packages such as METAL CONTAINERS and drums. However, less robust waste packages (e.g., FRPs) and even waste placed together in a pile without even bag containment forms a loosely agglomerated package of sorts that meets the intent of this control.

6.2.1.3 Noncombustible Waste Container

Any closed waste container constructed of a noncombustible material (e.g., steel or concrete) is credited with limiting the propagation of fire between noncombustible containers in a TRU WASTE STORAGE AREA. This attribute limits the consequences of a fire by limiting the amount of MAR involved.

Applicability: The TRU WASTE containers are required to meet the performance criteria when they contain TRU WASTE MAR.

ISI ACTIONs and FREQUENCIES are as follows:

IN-SERVICE INSPECTIONS	FREQUENCY
<p>The exposed faces of 10% of COMPLIANT metal TRU WASTE containers in above-ground facilities at the Area G site are to be inspected for leaks, significant corrosion, or significant damage according to WIPP criteria in Section 5.6.11(2)(a).</p> <p>If one or more inspected containers fail to meet the WIPP container inspection criteria, the failed container(s) will be remediated or handled as non-COMPLIANT containers, and a second 10% sample will be inspected.</p>	<p>Semi-Annually</p>

6.0 DESIGN FEATURES

Basis:

The ISI involves an inspection of the exposed face of the drum, on the basis that the condition of the exposed face is indicative of the entire drum, or is the part of the drum that would show the most degradation. This is because the unexposed faces are protected from environmental or operational impacts.

The ISI is applicable to a 10% sample of the population of the above-ground inventory of TRU METAL CONTAINERS. To provide a reasonable representation of the compliant container population, the sample of containers to be inspected will be selected from inventory database records, and a selected sample will not include containers that were included in the previous two inspections. If one or more of inspected sample containers fail the inspection criteria, the failed container(s) will be remediated or handled as non-COMPLIANT containers, and a second 10% sample of TRU METAL CONTAINERS will be inspected. The nature of drum handling/movement activities already requires constant surveillance of the drums, especially for the presence of vents, given recent operational experience. A TSR-AC requires the facility to implement procedures that require operators to visually inspect metal TRU WASTE containers for integrity and/or vents when HANDLING or TRANSPORTING containers. As a result, there is no additional value to performing the inspection on a larger percentage of the above-ground inventory as an ISI.

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Following are the bases for the generic LCO specified at the beginning of Section 3.0 of the TSR document. These generic LCOs apply to the LCOs in Section 3.1, as applicable, and associated remedial ACTIONS.

A3.0 GENERIC LIMITING CONDITIONS FOR OPERATION

GENERAL	LCOs 3.0.1 through 3.0.6 establish the general requirements applicable to all LCOs at all times, unless otherwise stated. The general requirements contained in LCOs 3.0.1-3.0.6 provide overall rules to guide the use and application of the specific requirements of the LCOs in Section 3.0 of the TSR. When exceptions to the general requirements contained in LCOs 3.0.1-3.0.6 are allowed, they are stated as notes in the individual LCOs.
LCO 3.0.1	LCO 3.0.1 establishes the MODE Applicability statements within each LCO as the requirement for conformance to the LCOs for safe operation of the facility or PROCESS AREAS. The ACTIONS establish the remedial measures that must be taken within specified COMPLETION TIME(S) when LCOs are not met as required by LCO 3.0.2.
LCO 3.0.2	<p>LCO 3.0.2 establishes that, on discovery of a failure to meet an LCO, the associated ACTIONS must be met within the specified COMPLETION TIME. The COMPLETION TIME of each ACTION is applicable from the time that a CONDITION is entered. The ACTIONS establish those remedial measures that SHALL be taken within specified COMPLETION TIME when the requirements of an LCO are not met.</p> <p>This LCO establishes that:</p> <ol style="list-style-type: none">1. Completing the ACTIONS within the specified COMPLETION TIME constitutes compliance with an LCO.2. Completing the ACTIONS is not required when an LCO is met within the specified COMPLETION TIME, unless otherwise stated. <p>There are two basic types of ACTIONS. The first type of ACTION specifies a time limit in which the LCO SHALL be met or additional ACTION is needed. This time limit is the COMPLETION TIME to restore an inoperable system or component to OPERABLE status or to restore variables to within specified limits. If this type of ACTION is not completed within the specified COMPLETION TIME, an ACTION will be required to place the facility in a MODE or condition to which the LCO is not applicable. (Whether stated as an ACTION or not, restoration of inoperable equipment or a condition back to within limits is an action that may always be considered on entering ACTIONS.)</p>

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A3.0 GENERIC LIMITING CONDITIONS FOR OPERATION

The second type of ACTION specifies remedial measures that permit continued operation of the facility without further restriction by the COMPLETION TIME of the ACTION. In this case, conformance to the ACTION provides an acceptable level of safety for continued operation.

Completing ACTIONS is not required when an LCO is met or is no longer applicable within the associated COMPLETION TIME, unless otherwise stated in the individual LCO.

The nature of some ACTIONS for some CONDITIONS necessitates that, once the CONDITION is entered, ACTIONS SHALL be completed even though the associated CONDITIONS are resolved. The ACTIONS of the individual LCOs specify where this is the case.

The COMPLETION TIME of the ACTIONS is also applicable when a system or component is intentionally taken out-of service. The reasons for intentionally relying on the ACTIONS include, but are not limited to, performance of surveillances, preventative or corrective maintenance, or investigation of operational problems. ACTIONS for these reasons are performed in a manner that does not compromise safety. It is not intended that ACTIONS be intentionally entered for operational convenience. This requirement is to limit routine, voluntary removal of redundant or standby equipment from service in lieu of other alternatives that would result in redundant or standby equipment being OPERABLE. This limits the time that subsystems or safety system trains are inoperable. Also limited is the time that other conditions exist that result in LCO 3.0.3 being entered. Individual LCOs may specify a time limit for performing an SR when equipment is taken out-of-service or bypassed for testing. In this case, the SR must be completed before the COMPLETION TIME of the ACTION expires. If the SR COMPLETION TIME exceeds the COMPLETION TIME, then the applicable ACTION must be completed.

When a change in MODE or other specified condition is required to comply with ACTIONS, the applicable area may enter a MODE or other specified condition in which a new LCO becomes applicable. In this case, the COMPLETION TIME of the associated ACTIONS would apply from the time that the new LCO becomes applicable, and any CONDITION(S) is entered.

LCO 3.0.3

LCO 3.0.3 establishes the ACTION(S) that are implemented when an LCO is not met:

1. Associated ACTIONS and COMPLETION TIMES are not met and no other CONDITION applies.
2. The CONDITION of the applicable area is not specifically addressed by the associated ACTIONS. This means that no combination of CONDITIONS stated in the ACTIONS corresponds exactly to the actual condition of the facility. Sometimes possible combinations of conditions are such that entering LCO 3.0.3 is warranted; in such cases, the

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A3.0 GENERIC LIMITING CONDITIONS FOR OPERATION

ACTIONS specifically state a CONDITION corresponding to such combinations and also that LCO 3.0.3 must be entered IMMEDIATELY.

This LCO delineates a time of 1 hr for initiating ACTIONS to place the AFFECTED AREA(S) in a safe MODE or other specified condition when operations cannot be maintained within the limits for safe operation, as defined by the LCO and its ACTIONS. It is not intended to be used as an operational convenience that permits routine voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable.

Upon entry into LCO 3.0.3, 1 hr is allowed to prepare for an orderly change in facility operation. The time limits permits the transition to COLD STANDBY to proceed in a controlled and orderly manner. This reduces the potential for a facility upset that could challenge safety systems under conditions to which this LCO applies.

The use and interpretations of specified times to complete the ACTIONS of LCO 3.0.3 SHALL be consistent with the discussion of Specification 1.4, "COMPLETION TIME".

A transition to COLD STANDBY required in accordance with LCO 3.0.3 may be aborted and LCO 3.0.3 exited if any of the following occurs:

1. The LCO is now met.
2. A CONDITION exists for which the ACTION has been performed.
3. ACTIONS exist that do not have expired COMPLETION TIMES. These COMPLETION TIMES are applicable from the time the CONDITION was initially entered and not from the time LCO 3.0.3 is exited.

The time limit of LCO 3.0.3 allows 1 hr to begin placing the AFFECTED DEFINED AREAs in a MODE or other specified condition where the LCO does not apply. If the LCO applies in all MODES, the AFFECTED DEFINED AREAs SHALL be placed in COLD STANDBY. If the AFFECTED DEFINED AREA cannot easily be placed in COLD STANDBY (e.g., all the MAR cannot be removed from a STORAGE AREA) than the AFFECTED DEFINED AREA SHALL be placed in WARM STANDBY as the safest MODE. LCO 3.0.3 requires these ACTIONS to be continuously and aggressively pursued until the AFFECTED DEFINED AREA is in COLD STANDBY.

The exceptions to LCO 3.0.3 are provided for instances where requiring a facility change in accordance with LCO 3.0.3 would not provide appropriate remedial measures for the associated condition of the applicable area. These exceptions are addressed in the individual LCOs.

LCO 3.0.4

LCO 3.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when an LCO is not met. It precludes placing the

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A3.0 GENERIC LIMITING CONDITIONS FOR OPERATION

applicable area in a different MODE or other specified condition when the following exists:

- The requirements of an LCO in the MODE or other specified condition to be entered are not met.
- Continued noncompliance with these requirements would result in requiring that the applicable area be placed in a MODE or other specified condition in which the LCO does not apply to comply with the ACTION(S).

Compliance with ACTION(S) that permit continued operation of the applicable area for an unlimited period of time in an applicable MODE or other specified condition provides an adequate level of safety for continued operation, without regard for the status of the applicable area before or after the MODE change. Therefore, in such cases, entry into a MODE or other condition in the Applicability statement may be made in accordance with the provisions of the ACTION(S). The provisions of this LCO SHALL not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before changing MODES.

The provisions of LCO 3.0.4 SHALL not prevent changes in MODES or other specified conditions in the Applicability statement that are required to comply with ACTION(S).

Exceptions to LCO 3.0.4 are generally stated in the individual LCOs. Exceptions may apply to all the ACTION(S) or to a specific ACTION of an LCO. An additional exception to LCO 3.0.4 is allowed for individual LCOs related to activities that contribute to the safety of the situation at Area G for outstanding PISA conditions and identified non-compliant RCRA waste containers. The outstanding PISAs are:

- 1) TRU Waste Drums Containing Treated Nitrate Salts May Challenge the Safety Analysis
- 2) Inadequate Waste Matrix Composition Analysis
- 3) MAR Discrepancies from Use of Historical Waste Generator Data
- 4) Single Drum Fuel Pool Fire

The specific activities that may be performed so that facility safety may continue and be improved are:

1. Sampling of Un-remediated Nitrate Salt (UNS) drums in SSSR Areas.
2. Sampling of CIN-01 drums in SSSR Areas.
3. Real-Time Radiography (RTR) of CIN-01 drums for characterization and proper storage.
4. Nondestructive assay (NDA) of waste containers (e.g., UNS and CIN 01) to provide best available assay information to support resolution of the MAR Discrepancy PISA.

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5. NDA of UNS and CIN-01 containers prior to sampling.
6. Preparation and shipment of LLW containers that are staged in Low Activity Areas (LAA) to reduce overall AREA G MAR and reduce the risks posed by outside storage of waste containers.
7. Characterization activities required to address identified non-compliant RCRA waste containers.
8. Preparation and shipment of MLLW containers to maintain compliance with the Site Treatment Plan.
9. Other related actions that may be needed to support the activities described in 1 through 8. For example, related actions may include the movement of drums from one location to another, establishment of a Defined Area, or moving drums from a current storage location to a RCRA authorized storage location.
10. Doublepacking of TRU waste containers found to exceed 80 PE-Ci to support implementation of AREAG-ESS-14-001-R4, *Evaluation of the Safety of the Situation: Single Drum Fuel Pool Fire PISA*, and to address any containers from the MAR Discrepancy PISA.

The activities specified above are consistent with operations that are routinely performed at Area G and those described and evaluated in the Area G BIO. Specifically, the sampling activities identified in items 1 and 2 are consistent with the sampling activities described in BIO Section 2.5.6.2.2, *Discrete Waste Sampling*. The RTR and NDA activities identified in items 3, 5 and 7 are consistent with the characterization activities described in BIO Section 2.5.6. *Waste Characterization and Verification Activities*. Items 6, 8, 9, and 10 primarily involve waste container movement and handling. These activities are consistent with the activities described in BIO Section 2.5.1.3, *Transport/Handling Waste Containers*.

The specified activities in items 1 through 10 above directly contribute to improving the safety of the situation at Area G for the identified PISA conditions and identified non-compliant RCRA waste containers. Since the activities are consistent with operational activities routinely performed at Area G, they do not introduce new hazard or initiating events beyond those considered in the Area G BIO. Existing controls derived from the Area G BIO and specified in the TSRs are adequate to prevent and/or mitigate potential hazards associated with specified activities with the outstanding PISA conditions.

When changing MODES or other specified condition while in a CONDITION (in compliance with LCO 3.0.4 or where an exception to LCO 3.0.4 is stated), the ACTION(S) define the remedial measures that apply. Surveillances do not have to be performed on the associated inoperable equipment (or on LCO specified variables outside the specified limits), as permitted by SR 4.0.1. Therefore, a change in MODE or other specified condition in this situation does not violate SR 4.0.1 or SR 4.0.4 for those Surveillances that do not have to be performed because of the associated inoperable equipment. However, Surveillances SHALL be met to demonstrate OPERABILITY before declaring

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A3.0 GENERIC LIMITING CONDITIONS FOR OPERATION

the associated equipment OPERABLE (or variable within limits) and restoring compliance with the AFFECTED LCO.

LCO 3.0.5

LCO 3.0.5 establishes the allowance of restoring equipment to service under administrative/procedural controls when it has been removed from service or declared inoperable to comply with ACTION(S). The sole purpose of this LCO is to provide an exception to LCO 3.0.2 to allow the performance of SRs to demonstrate the following:

1. OPERABILITY of the equipment being returned to service, or
2. OPERABILITY of other associated equipment.

Administrative/procedural controls are to ensure that the time the equipment is returned to service in conflict with the requirements of the ACTION(S) is limited to the time absolutely necessary to perform the allowed SR. This LCO does not provide time to perform any other preventive or corrective maintenance.

LCO 3.0.6

LCO 3.0.6 establishes an exception to LCO 3.0.2 for support systems that have a LCO specified in the TSRs. This exception is not used in the TSRs because no support systems have LCOs specified in the TSRs.

When a support system is inoperable and there is no LCO specified for it, the impact of the degradation of the support system function on the OPERABILITY of its supported systems SHALL be evaluated. The degradation of the support system may or may not affect the OPERABILITY of the supported systems. OPERABILITY of the supported system SHALL depend on the intended function of the supported system and the level of support that the support system provides. Unless otherwise justified (on determination that the supported system is inoperable), the CONDITION(S) and ACTION(S) of the supported system's LCO SHALL apply or other compensatory actions or requirements SHALL apply, as otherwise justified.

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A4.0 GENERIC SURVEILLANCE REQUIREMENTS

GENERAL

SR 4.0.1 through SR 4.0.4 establish the general requirements applicable to all SPECIFICATIONS and apply at all times, unless otherwise stated.

SR 4.0.1

SR 4.0.1 establishes the requirements that SRs SHALL be met during the MODES or other specified conditions in the Applicability for which the requirements of the LCO apply, unless otherwise specified in the individual SRs. This specification ensures that SRs are performed to VERIFY the OPERABILITY of systems and components, and that variables are within specified limits. Failure to meet an SR within the specified FREQUENCY, in accordance with SR 4.0.2, constitutes a failure to meet an LCO.

Systems and components are assumed to be OPERABLE when the associated SRs have been met. Nothing in this Specification, however, is to be construed as implying that systems and components are OPERABLE when:

1. The systems or components are known to be inoperable, although still meeting the SRs.
2. The SRs are known not to be met between required surveillance performances.

SRs do not have to be performed when the applicable area is in a MODE or other specified condition for which the requirements of the associated LCO are not applicable, unless otherwise specified. The SRs associated with a test exception are only applicable when the test exception is used as an allowable exception to the requirements of a specification.

Surveillances, including SRs invoked by ACTIONS, do not have to be performed on inoperable equipment because the ACTIONS define the remedial measures that apply. SRs have to be met in accordance with SR 4.0.2 before returning equipment to OPERABLE status.

Measurement devices used to demonstrate compliance with LCOs SRs are calibrated to plant design, manufacturer's specifications and/or industry standards as described in the Laboratory Calibration Program.

Upon completion of maintenance, appropriate post-maintenance testing is required to declare equipment OPERABLE. This includes meeting applicable SRs in accordance with SR 4.0.2. Post-maintenance testing may not be possible in the current MODE or other specified conditions in the Applicability because the necessary facility parameters were not established.

In these situations, the equipment may be considered OPERABLE, provided testing has been satisfactorily completed to the extent possible and the equipment is not otherwise believed to be incapable of performing its function. This SHALL allow operation to proceed to a MODE or other specified condition where other necessary post-maintenance tests can be completed.

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A4.0 GENERIC SURVEILLANCE REQUIREMENTS

- SR 4.0.2 SR 4.0.2 establishes the requirements for meeting the specified FREQUENCY for SRs and any ACTION with a COMPLETION TIME that requires the periodic performance of the required action on a “once per . . .” interval.
- SR 4.0.2 permits a 25% extension of the interval specified in the FREQUENCY. This facilitates surveillance scheduling and considers facility operating conditions that may not be suitable for conducting the SR (e.g., transient conditions or other ongoing surveillance or maintenance activities).
- The 25% extension does not significantly degrade the reliability that results from performing the SR at its specified FREQUENCY. This is based on the recognition that the most probable result of any particular surveillance being performed is the verification of conformance with the SRs. The exceptions to SR 4.0.2 are those SRs for which the 25% extension of the interval specified in the FREQUENCY does not apply. These exceptions are stated in the individual specifications. An example of where SR 4.0.2 does not apply is an SR with a FREQUENCY of “in accordance with another DOE regulation.” The requirements of regulations take precedence over the TSRs. The TSRs cannot in and of themselves extend a test interval specified in the regulations. Therefore, there would be a note in the FREQUENCY stating, “SR 4.0.2 is not applicable.”
- As stated in SR 4.0.2, the 25% extension also does not apply to the initial portion of a periodic COMPLETION TIME that requires performance on a “once per . . .” basis. The 25% extension applies to each performance after the initial performance. The initial performance of the ACTION, whether it is a particular SR or some other remedial action, is considered a single ACTION with a single COMPLETION TIME. One reason for not allowing the 25% extension to this COMPLETION TIME is that such a ACTION usually verifies that no loss of function has occurred by checking the status of redundant or diverse components or accomplishes the function of the inoperable equipment in an alternative manner.
- The provisions of SR 4.0.2 are not intended to be used repeatedly as an operational convenience to extend SR intervals or periodic COMPLETION TIME intervals beyond those specified.
- SR 4.0.3 SR 4.0.3 establishes the flexibility to defer declaring AFFECTED equipment inoperable or an AFFECTED variable outside the specified limits when an SR has not been completed within the specified FREQUENCY. A delay period of up to 24 hr applies from the time it is discovered that the SR has not been performed, in accordance with SR 4.0.2, and not at the time the specified FREQUENCY was not met.
- This delay period provides an adequate time limit to complete missed SRs. This delay period permits the completion of an SR before compliance with ACTIONS or other remedial measures would be required that may preclude completion of the SR.

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A4.0 GENERIC SURVEILLANCE REQUIREMENTS

The basis for this delay period includes consideration of facility conditions, adequate planning, availability of personnel, the time required to perform the surveillance, and the recognition that the most probable result of any particular surveillance being performed is the verification of conformance with the SRs.

When an SR with a FREQUENCY based not on time intervals but on specified facility conditions or operational situations is discovered not to have been performed when specified, SR 4.0.3 allows the full 24-hr delay period in which to perform the surveillance.

The provisions of SR 4.0.3 also provide a time limit for completion of SRs that become applicable as a consequence of MODE changes imposed by ACTIONS.

Failure to comply with specified Frequencies for SRs is expected to be an infrequent occurrence. Use of the delay period established by SR 4.0.3 is a flexibility that is not intended to be used as an operational convenience to extend surveillance intervals. This extension also does not preclude notification of a violation of SR 4.0.2.

If an SR is not completed within the allowed delay period, the equipment is considered inoperable or the variable is considered outside the specified limits. The COMPLETION TIMES of the ACTIONS for the applicable LCO CONDITIONS begin IMMEDIATELY on expiration of the delay period. If an SR is failed within the delay period, the equipment is inoperable or the variable is outside the specified limits. The COMPLETION TIMES of the ACTIONS for the applicable LCO CONDITIONS begin IMMEDIATELY on the failure of the SR.

Completion of the SR within the delay period allowed by this specification or within the COMPLETION TIME of the ACTIONS restores compliance with SR 4.0.1.

SR 4.0.4

SR 4.0.4 establishes the requirement that all applicable SRs must be met before entry into a MODE or other specified condition in the Applicability statements. This SR ensures that system and component OPERABILITY requirements and variable limits are met before entry into a MODE or other specified condition in the Applicability for which these systems and components ensure safe operation of the facility. This specification applies to changes in MODES or other specified conditions in the Applicability statements associated with the facility, shutdown as well as startup.

The provisions of SR 4.0.4 SHALL not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with the ACTION(S).

The precise requirements for performance of SRs are specified so that exceptions to SR 4.0.4 are not necessary. The specific time frames and conditions necessary for meeting the SRs in accordance with the requirements of SR 4.0.4 are specified in the FREQUENCY, in the SR, or both. This allows performance of SRs when the prerequisite conditions specified in a Surveillance procedure require entry into the MODE or other specified condition in the

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A4.0 GENERIC SURVEILLANCE REQUIREMENTS

Applicability of the associated LCO prior to the performance or completion of a SR. A SR, which could not be performed until after entering the LCO Applicability statements, would have its FREQUENCY specified such that it is not “due” until the specific condition needed is met. Alternatively, the SR may be stated in the form of a Note as not required (to be met or performed) until a particular event, operating configuration, or time has been reached. The SRs are annotated consistent with the requirements of Section 1.5, “FREQUENCY Notation.”

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.1 SORT, SEGREGATE, SIZE REDUCTION, AND REPACKAGING (SSSR) AREA PROCESS CONTROLS

BACKGROUND SUMMARY

MAR is a fundamental means of limiting the source term for off-site dose calculations. Accordingly, MAR inventories must be maintained at levels that are acceptable from a risk perspective, but at levels that enable the facility to perform its mission. Spills are generally localized phenomena caused by mishandling of material in operations, failure of confinement, failure of containers due to impacts during movement, etc. Fires have the potential to affect the entire facility, therefore a potential of exposing the total MAR inventory exists. Because of this and the potential for spread of fire, the minimization of MAR inventories in the facility takes on additional significance in protecting the health and safety of the public from a radioactive release. Explosions due to ignition of flammable gasses or detonation of reactive materials disperse MAR. Stored and handled MAR is vulnerable to the effects of a natural phenomena hazard such as a seismic event (including a seismic event followed by a fire), wild land fires, or high winds. External events such as aircraft crashes into buildings or other areas can affect the inventory located in these areas.

Therefore, based on balancing acceptable risk and process need, the total amount of MAR authorized for each applicable DEFINED AREA within the facility is limited. The facility employs an inventory tracking system, which converts material quantities into an equivalent plutonium Curies (PE-Ci) or tritium Ci, as appropriate, for each DEFINED AREA. These values are compared against established limits to VERIFY that the facility maintains its MAR inventory within the safety envelope.

The accident analysis in Chapter 3 of the BIO, describes the accidents in detail.

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.1 SORT, SEGREGATE, SIZE REDUCTION, AND REPACKAGING (SSSR) AREA PROCESS CONTROLS

APPLICATION TO
SAFETY
ANALYSIS

The accident analysis assumes the contents are susceptible to a fire. The accident analysis considers three basic types of contaminated waste matrices. These are dispersible/ combustible solids, dispersible/non-combustible solids, and non-dispersible non-combustible solids. For the SSSR AREA, the bounding accident considered that the waste involved was of an all combustible waste matrix. A much higher MAR value associated with non-combustible waste matrices is required to achieve the same dose consequences in an accident scenario involving the MAR in the all combustible waste matrix. Rather than establish and track inventory limits for each type of contaminated waste material inside an SSSR AREA, a conversion factor may alternatively be used. The conversion factor is multiplied by the MAR of a waste container in a non-combustible waste matrix. The resultant 'EQUIVALENT COMBUSTIBLE WASTE' MAR value is counted against the SSSR EQUIVALENT COMBUSTIBLE WASTE MAR limits. Reference 1 provides the methodology to determine an equivalent combustible waste conversion factor.

A MAR limit of ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE in process, together with a MAR limit of ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE that is staged in closed containers in each SSSR AREA are imposed to ensure that MAR is maintained at or below the MAR considered in the accident analysis. Specifically, the accident analysis demonstrates that ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE subject to unconfined burning together with ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE that is staged in closed containers and burns confined will not result in unmitigated consequences that exceed the Evaluation Guidelines (EGs) for the public.

Under this LCO, waste staged in closed containers includes the next parent container awaiting SSSR processing, or remediated daughter containers awaiting removal from the SSSR AREA. In the unlikely event that 18 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE in process together with 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE that is staged in closed containers awaiting processing exists at the same time in a given SSSR AREA, operations could continue to (conservatively) consider the completed 18 PE-Ci daughter containers as in process until they are closed and removed from the SSSR AREA provided the waiting 18 PE-Ci parent container remains closed/staged until the in process daughter containers are closed and removed from the SSSR AREA. Treating MAR as in process (Open container) is conservative since the safety analysis assumes the waste burns unconfined and results in higher dose consequences than if the MAR were in a closed/staged parent or daughter container during a fire.

LCO

MAR in each SSSR AREA SHALL be limited as follows:

1. ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE, in process, and

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.1 SORT, SEGREGATE, SIZE REDUCTION, AND REPACKAGING (SSSR) AREA PROCESS CONTROLS

	2. ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE, staged, in closed container(s)
APPLICABILITY	<p>This LCO is applicable to SSSR AREAS at all times .</p> <p>This LCO is only applicable to SSSR AREAS. MAR limits for other DEFINED AREAS are covered with other LCOs. Within the SSSR AREA, waste material may be removed from waste containers, and may be in process for remediation and repackaging.</p>
CONDITION A and associated ACTIONS and COMPLETION TIMES	<p>CONDITION A is entered when the total MAR inventory in an SSSR AREA exceeds 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE in process, or exceeds 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE staged in closed container(s), awaiting processing or removal. A separate CONDITION entry is allowed for each SSSR AREA. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory and then restoration to meet the limit.</p> <p>ACTION A.1 requires the IMMEDIATE stopping of the receipt of TRU MAR inventory inside the AFFECTED SSSR AREA. That represents the most conservative COMPLETION TIME available to the operator. The ACTION begins when the CONDITION is recognized and continuously pursued until the ACTION is complete. The ACTION averts an increase in the magnitude of potential radiological material releases involving MAR in an SSSR AREA during accident conditions beyond that analyzed in the accident analysis.</p> <p>ACTION A.2.1 requires the IMMEDIATE restoration of the MAR in the AFFECTED SSSR AREA to ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE in process, and ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE staged in closed container(s), awaiting processing or removal. The ACTION begins when the CONDITION is recognized and continuously pursued until the ACTION is complete. The ACTION reduces the likelihood that consequences of an accident can occur beyond that analyzed in the hazard analysis.</p> <p>ACTION A.2.2 requires the establishment of a STATIONARY FIRE WATCH at the AFFECTED SSSR AREA within 2 hours. The STATIONARY FIRE WATCH can identify any fire issues that occur during continuation of the processing. The 2 hour COMPLETION TIME is necessary to get the STATIONARY FIRE WATCH personnel to the SSSR AREA and is very short relative to the frequency of fires at Area G. It should be noted that while this ACTION does help mitigate the frequency of a postulated fire in the SSSR AREA, it does not mitigate the frequency for other accident scenarios. For example, the act of bringing in another worker to the AFFECTED SSSR AREA, where MAR is greater than analyzed in the BIO, may increase the workers dose during a postulated accident such as a spill, which may have a higher frequency</p>

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.1 SORT, SEGREGATE, SIZE REDUCTION, AND REPACKAGING (SSSR) AREA PROCESS CONTROLS

than the fire scenario. However, since fire is the largest risk hazard for SSSR, this ACTION was the most appropriate compensatory measure.

ACTION A.2.3 requires the AFFECTED SSSR AREA MAR inventory be reduced to ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE in process, and ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE staged in closed container(s), awaiting processing or removal, within 7 days. This ACTION restores compliance with the LCO. Seven days is sufficient time to plan and execute activities necessary to restore the MAR to (or below) the limit. 7 days is a relatively short time period compared with the unmitigated frequency of accidents analyzed in the BIO.

SURVEILLANCE REQUIREMENTS

SR 4.1.1.1

This SR requires VERIFICATION that the in process MAR inventory in an SSSR AREA remains ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE prior to opening of TRU WASTE container(s) in the SSSR AREA. The database inventory can be used in this VERIFICATION.

The FREQUENCY requirement of VERIFICATION prior to opening TRU WASTE containers in the SSSR AREA minimizes the possibility that the LCO limit will be exceeded. This SR VERIFIES that with the planned opening of a TRU WASTE container, the LCO MAR limit is met.

SR 4.1.1.2

This SR requires VERIFICATION that the staged MAR inventory in an SSSR AREA remains ≤ 18 PE-Ci EQUIVALENT COMBUSTIBLE WASTE prior to introducing additional TRU WASTE container(s) into the SSSR AREA. The database inventory can be used in this VERIFICATION.

The FREQUENCY requirement of VERIFICATION prior to introducing TRU WASTE containers into the SSSR AREA minimizes the possibility that the LCO limit will be exceeded. This SR VERIFIES that with the planned TRU WASTE container addition, the LCO MAR limit is met.

REFERENCES

1. SB-DO:CALC-09-021, Rev. 0; *Source Term and Consequence Analysis for (Plutonium-239) Combustible Equivalency for Environmental Management Waste Forms – TA-54, Area G*, Los Alamos National Laboratory, NM, August 2009.
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APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.2 LOW-ACTIVITY AREA (LAA)

APPLICATION TO SAFETY ANALYSIS LAAs were identified for storage, characterization, compaction, consolidation, and disposal of LLW, MLLW, low-level TRITIUM-CONTAMINATED WASTE and TRU WASTE. Combustible and dispersible materials within a LAA are contained within some form of wrapping (e.g., plastic wrap, cardboard box, or wooden crate) which would result in the material burning in an agglomerated condition, in accordance with DOE-STD-3010, thereby, reducing the airborne release fractions and respirable fractions.

This control addresses fire, explosion, and spill events.

LCO

LAA MAR SHALL be limited as follows:

1. The total EXPOSED TRITIUM-CONTAMINATED WASTE at Area G is $\leq 3,000$ tritium Ci
2. The total LAA EXPOSED MAR at Area G is ≤ 100 PE-Ci
3. BURIED waste within an LAA SHALL be covered with ≥ 3 inches of overburden fill material (dirt or equivalent barrier).

LAAs may include radioactive waste placed within below grade pits, trenches, or shafts, or contained in roll-off bins, transportainers, drums or other containers that are stored above grade. The inventory in all above grade LAAs is EXPOSED.

The waste placed within a below grade pit, trench, or shaft is EXPOSED until it has been covered with at least 3 inches of overburden fill material. When the overburden has been placed and verified, the waste within the LAA is BURIED and no longer has to be counted against the EXPOSED MAR limit for the LAA or for the Area G site. Layers of waste may be successively placed, then BURIED, until the pit, trench, or shaft is closed to further additions.

LAAs can be established wherever needed. The total number of LAAs SHALL have a combined total of ≤ 100 PE-Ci of EXPOSED LAA waste and $\leq 3,000$ tritium Ci of EXPOSED TRITIUM-CONTAMINATED WASTE. The 100 PE-Ci EXPOSED LAA waste and 3,000 Ci of EXPOSED TRITIUM-CONTAMINATED WASTE can be combined in the same LAA.

The LCO stipulates that only the 'EXPOSED' MAR is counted. For the purposes of this LCO, this means MAR that is covered by ≤ 3 inches of dirt or equivalent. Material that is covered by greater than or equal to 3 in. of dirt or equivalent barrier is not counted against the LAA inventory limits as this depth of dirt is sufficient to prevent the buried waste from burning, as described in the Area G BIO, Section 3.3.2.3.2.2-H.

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.2 LOW-ACTIVITY AREA (LAA)

APPLICABILITY	This LCO is applicable in OPERATION and WARM STANDBY because those are the MODES that allow MAR to be present. The LCO is only applicable to LAAs, as other DEFINED AREAS are covered by other LCOs.
CONDITION A and associated ACTIONS and COMPLETION TIMES	<p>CONDITION A is entered when the total EXPOSED TRITIUM-CONTAMINATED WASTE MAR inventory at Area G exceeds 3,000 tritium Ci. Under the CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory and then restoration to meet the limit.</p> <p>ACTION A.1 requires the IMMEDIATE stopping of the receipt of MAR inventory inside all LAAs, which represents the most conservative COMPLETION TIME available to the operator. The ACTION begins when the CONDITION is recognized and continuously pursued until the ACTION is complete. The ACTION averts an increase in the magnitude of potential radiological material releases involving MAR in the LAAs during accident conditions beyond those analyzed in the accident analysis. The COMPLETION TIME of IMMEDIATELY addresses the importance of completing this ACTION.</p> <p>ACTION A.2 requires that all LAAs be placed in WARM STANDBY within 2 hr. This ACTION places all LAAs into a SAFE CONFIGURATION, which minimizes accident initiators and stops NON-ESSENTIAL ACTIVITIES. This ACTION reduces the accident risk to a very low level as rapidly as possible and minimizes the potential for accident conditions to impact the excess MAR. The 2 hour COMPLETION TIME is very short compared to the frequency of postulated accidents, yet it is sufficient time to safely make the MODE transition.</p> <p>ACTION A.3 requires the total EXPOSED TRITIUM-CONTAMINATED WASTE MAR inventory limit to be restored within 7 days. The ACTION may be accomplished by physically removing inventory or (for LAA pits, trenches, or shafts) covering the waste with the overburden depth necessary to consider the waste BURIED and no longer part of the EXPOSED inventory. This ACTION restores compliance with the LCO. Seven days is sufficient time to plan and execute activities necessary to restore the MAR to (or below) the limit. Seven days is a relatively short time period compared with the unmitigated frequency of accidents analyzed in the BIO.</p>
CONDITION B and associated ACTIONS and COMPLETION TIMES	<p>CONDITION B is entered when the total EXPOSED MAR inventory in all LAAs exceeds 100 PE-Ci. Under the CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory and then restoration to meet the limit.</p> <p>ACTION B.1 requires the IMMEDIATE stopping of the receipt of MAR inventory inside all LAAs, which represents the most conservative COMPLETION TIME available to the operator. The ACTION averts an increase in the magnitude of potential radiological material releases involving</p>

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.2 LOW-ACTIVITY AREA (LAA)

MAR in a LAA during accident conditions beyond that analyzed in the accident analysis. The COMPLETION TIME of IMMEDIATELY addresses the importance of completing this ACTION.

ACTION B.2 requires all LAA(S) to IMMEDIATELY be placed in WARM STANDBY. This ACTION places all the LAAs into a SAFE CONFIGURATION, which minimizes accident initiators and stops NON-ESSENTIAL ACTIVITIES. This ACTION reduces the accident risk to a very low level as rapidly as possible and minimizes the potential for accident conditions to impact the excess MAR. The COMPLETION TIME of IMMEDIATELY stresses the importance of completing this ACTION as soon as possible.

ACTION B.3 requires the total Area G LAA EXPOSED MAR inventory to be reduced to ≤ 100 PE-Ci within 7 days. This ACTION restores compliance with the LCO. Seven days is sufficient time to plan and execute activities necessary to restore the MAR to (or below) the limit. 7 days is a relatively short time period compared with the unmitigated frequency of accidents analyzed in the BIO.

CONDITION C and associated ACTIONs and COMPLETION TIMES

CONDITION C is entered when BURIED radioactive waste in an LAA has become EXPOSED (has less than 3 inches of overburden fill material, or equivalent). Upon being declared BURIED, the waste may be removed from the LAA EXPOSED MAR inventory. If natural or man-made events cause the overburden coverage to be significantly reduced, the waste may become EXPOSED and not sufficiently protected to prevent an accidental release of material. The layer of EXPOSED waste must be considered in the above-ground inventory for the affected LAA.

ACTION C.1 requires the IMMEDIATE cessation (stopping) of placing radioactive waste in the affected LAA. The ACTION begins when the CONDITION is recognized. The ACTION averts an increase in the magnitude of potential radioactive material releases from the LAA.

ACTION C.2.1 or C.2.2 is required to be completed within 3 days. ACTION C.2.1 requires SR 4.1.2.2 to be performed to determine if the EXPOSED waste inventory is less than or equal to the EXPOSED MAR limit for the affected LAA. ACTION C.2.2 requires the overburden fill material depth be restored to ≥ 3 inches of overburden over radioactive waste in the affected LAA. This will return the waste to the intended BURIED state.

SURVEILLANCE REQUIREMENTS

SR 4.1.2.1

This SR requires quarterly VERIFICATION that the total EXPOSED TRITIUM-CONTAMINATED WASTE MAR inventory at Area G is $\leq 3,000$ tritium Ci. The SR is considered complete when the total sum of the LAA inventories are determined which may be several days after the data is obtained. The quarterly FREQUENCY is acceptable because the EXPOSED

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.2 LOW-ACTIVITY AREA (LAA)

	inventory in the LAAs is typically much less than the limit, and based upon historical waste activity data, this level is not expected to be exceeded in a three-month period especially since there are other activities that track receipt, movement, and retrieval of waste in the LAAs.
SR 4.1.2.2	This SR requires quarterly VERIFICATION that the total EXPOSED LAA MAR at Area G is less than or equal to the total LCO limit of 100 PE-Ci. The SR is considered complete when the total sum of the LAA inventories are determined which may be several days after the data are obtained. The quarterly FREQUENCY is acceptable because the total LAA EXPOSED MAR at Area G is typically much less than the limit, and based upon historical waste activity data this level is not expected to be exceeded in a three-month period. This is especially the case because there are other activities that track receipt, movement, and retrieval of waste in a LAA.
SR 4.1.2.3	This SR required VERIFICATION that the MAR in an LAA is covered with ≥ 3 inches of overburden fill material, or equivalent, prior to declaring the MAR to be BURIED. Performance FREQUENCY of “prior to declaring radioactive waste in an LAA BURIED” ensures that waste is adequately covered before the inventory is removed from the individual LAA’s EXPOSED MAR inventory for tracking purposes.
SR 4.1.2.4	This SR requires the monthly inspection of overburden on BURIED radioactive waste within LAAs for signs of significant erosion, subsidence, or other signs of loss of cover. Performance FREQUENCY of monthly ensures that waste counted as below-ground inventory remains covered.

REFERENCES	None
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APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.3 TRANSPORTATION VEHICLE Limits

APPLICATION TO SAFETY ANALYSIS

The safety function of each radiological inventory limit is to mitigate the consequences of an event occurring within Area G involving a TRANSPORTATION VEHICLE. For example, Chapter 3 of the BIO analyzes an accident involving a vehicle accident with a subsequent pool fire. This accident analysis derived the MAR limits for TRANSPORTATION VEHICLES. The other limits were derived from the Hazards Analysis.

LCO

The quantity of MAR present on an individual TRANSPORTATION VEHICLE SHALL be limited as follows:

≤ 1100 PE-Ci with only COMPLIANT METAL CONTAINERS

OR

≤ 615 PE-Ci with one or more non-COMPLIANT METAL CONTAINERS or non-METAL CONTAINERS.

OR

≤ 35 PE-Ci,

AND

$\leq 3,000$ tritium Ci

OR

$\leq 1,000,000$ tritium Ci total.

TRANSPORTATION VEHICLES with only COMPLIANT METAL CONTAINERS have a MAR limit of $\leq 1,100$ PE-Ci. If the TRANSPORTATION VEHICLE(s) has one or more non-COMPLIANT METAL CONTAINERS or non-METAL CONTAINERS, the MAR limit is reduced to ≤ 615 PE-Ci because these containers are credited with providing less protection of MAR than COMPLIANT METAL CONTAINERS, in the event of their involvement in an accident involving impact and/or fire.

Note that MAR in containers with a damage ratio of zero does not contribute to offsite dose consequences and is, therefore, excluded from the limits of this LCO. An example of such containers is certified Type B packages (see SC DESIGN FEATURE Section). It is notable that this exception is for certified Type B packages. If a Type B package's certification expires, this MAR may no longer be excluded from the MAR limit. For MAR in containers with a damage ratio greater than zero but less than one, the applicable damage ratio may be applied to the LCO limits. An example of such containers is a POC, which has a DR = 0.1 (see SC DESIGN FEATURE Section).

Certified Sealed Sources provide assurance that the radiological materials in these containers are not readily releasable. Containment of radiological material within a Certified Sealed Source ensures that the consequences of any given event are negligible. Typically a DR=0 could be assigned to these

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.3 TRANSPORTATION VEHICLE Limits

containers, if there are no accidental insults to these containers that would release the material to the environment. Certified sealed sources or special form capsules that conform to 49 CFR 173.469 or American National Standards Institute (ANSI) N43.6 provide for defense-in-depth by ensuring that the radiological material is not releasable.

It is also noted that some sealed sources at TA-54, Area G cannot be verified as being certified to 49 CFR 173.469 and ANSI N43.6 requirements to survive accident conditions. Sealed sources are stored and managed via the Area G source control policy that complies with the source control policy specified in Article 431 of the DOE RadCon Manual through the Radiation Protection Program. Because some sealed sources at Area G have not been certified to resist release of radiological material under accident conditions, all sealed sources will be tracked and counted against the TRANSPORTATION VEHICLE MAR limits when being transported with MAR. Only sealed sources stored within a Pipe Overpack Container will be subject to the reduced Damage Ratio allowed by DOE-STD-5506.

APPLICABILITY

This LCO is applicable during OPERATION and WARM STANDBY because those are the only MODES that allow MAR to be present. The LCO is only applicable to the TRANSPORTATION VEHICLES as described in the LCO, as other DEFINED AREAS are covered by different MAR LCOs.

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.3 TRANSPORTATION VEHICLE Limits

CONDITION A and associated ACTIONS and COMPLETION TIMES	CONDITION A is entered when any of the TRANSPORTATION VEHICLE MAR values stipulated in the LCO is exceeded
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Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory and then restoration to meet the limit. A separate CONDITION entry is allowed for each AFFECTED TRANSPORTATION VEHICLE, which allows for separate tracking of each ACTION.

ACTION A.1 requires that the movement and loading of the AFFECTED TRANSPORTATION VEHICLE be stopped IMMEDIATELY. The ACTION of stopping the loading averts an increase in the magnitude of potential radiological material releases involving MAR on a TRANSPORTATION VEHICLE during accident conditions beyond that analyzed in the accident analysis. The ACTION of stopping movement of the AFFECTED vehicle provides a compensatory measure by reducing the likelihood that the vehicle will be involved in a crash. The COMPLETION TIME of IMMEDIATELY addresses the importance of completing these ACTIONS without delay.

ACTION A.2 requires that the MAR be reduced on the AFFECTED TRANSPORTATION VEHICLE to within the LCO limits. The COMPLETION TIME is 24 hr. This ACTION restores compliance with the LCO. The COMPLETION TIME of 24 hr allows time to remove the excess MAR but is a very short time compared to the time intervals addressed in the accident analysis for vehicular accidents.

SURVEILLANCE REQUIREMENTS

SR 4.1.3.1

This VERIFIES that the amount of TRU WASTE MAR loaded on a TRANSPORTATION VEHICLE with only COMPLIANT METAL CONTAINERS is $\leq 1,100$ PE-Ci prior to vehicle movement. This SR mitigates the likelihood of TRANSPORTATION VEHICLES from moving within the Area G site if the vehicle MAR limit is exceeded. Performing the surveillance prior to vehicle movement is judged to be sufficient to prevent the most likely accident initiators, which are associated with operating the vehicle. Due to the discrete nature of TRANSPORTATION VEHICLE movements and loadings (e.g., vehicles of different MAR loadings are moved at various time) a set surveillance frequency (e.g., weekly) was judged to not be an effective surveillance interval.

SR 4.1.3.2

This SR VERIFIES that the amount of TRU WASTE MAR loaded on a TRANSPORTATION VEHICLE with one or more non-COMPLIANT METAL CONTAINERS or non-METAL CONTAINERS is ≤ 615 PE-Ci prior to vehicle movement. This SR mitigates the likelihood of TRANSPORTATION VEHICLES from moving within the Area G site if the vehicle MAR limit is exceeded. Performing the surveillance prior to vehicle

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.3 TRANSPORTATION VEHICLE Limits

- movement is judged to be sufficient to prevent the most likely accident initiators, which are associated with operating the vehicle. Due to the discrete nature of TRANSPORTATION VEHICLE movements and loadings (e.g., vehicles of different MAR loadings are moved at various time) a set surveillance frequency (e.g., weekly) was judged to not be an effective surveillance interval.
- SR 4.1.3.3 This SR VERIFIES that the amount of LLW or MLLW MAR on a TRANSPORTATION VEHICLE is less than or equal to 35 PE-Ci and less than or equal to 3,000 tritium Ci, prior to vehicle movement. This SR mitigates the likelihood of TRANSPORTATION VEHICLES from moving within the Area G site if the vehicle MAR limit is exceeded. Performing the surveillance prior to vehicle movement is judged to be sufficient to prevent the most likely accident initiators, which are associated with operating the vehicle. Due to the discrete nature of TRANSPORTATION VEHICLE movements and loadings (e.g., vehicles of different MAR loadings are moved at various time) a set surveillance frequency (e.g., weekly) was judged to not be an effective surveillance interval.
- SR 4.1.3.4 This SR VERIFIES that the amount of tritium MAR on a TRANSPORTATION VEHICLE is less than or equal to 1,000,000 tritium Ci, prior to vehicle movement. This SR mitigates the likelihood of TRANSPORTATION VEHICLES from moving within the Area G site if the vehicle MAR limit is exceeded. Performing the surveillance prior to vehicle movement is judged to be sufficient to prevent the most likely accident initiators, which are associated with operating the vehicle. Due to the discrete nature of TRANSPORTATION VEHICLE movements and loadings (e.g., vehicles of different MAR loadings are moved at various time) a set surveillance frequency (e.g., weekly) was judged to not be an effective surveillance interval.

REFERENCES None

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.4 STORAGE AREA, TRITIUM AREA, and PROCESS AREA MAR

APPLICATION TO SAFETY ANALYSIS	<p>By limiting the amount of material available to be involved in an event, a process upset affecting one or more DEFINED AREAS could only release that amount for which public, collocated worker, and worker consequences have been evaluated.</p> <p>This control addresses fire, explosion, and spill events. Based upon the types of activities that may be conducted within DEFINED AREAS, limiting the quantity of radiological material that may be involved in any one process upset is an effective means for controlling risk.</p> <p>In addition to the amount of MAR, the source terms for the analyzed accidents involving TRU WASTE are highly dependent on whether the TRU WASTE is confined or unconfined. PROCESS AREA activities and TRU storage involving TRU WASTE containers are analyzed as confined TRU WASTE. Although the handling of a TRU WASTE container in a PROCESS AREA may result in the container being partially open due to the removal/replacement of a metal TRU WASTE container lid, gasket, bung, vent, or filter (for inner or outer containers), these conditions are allowed in a PROCESS AREA since waste is not removed from the container, and these conditions are appropriately analyzed as confined TRU WASTE. Similarly, the overpacking, denesting, and gas sampling of metal TRU WASTE containers in a STORAGE AREA are analyzed as confined TRU WASTE.</p> <p>External and natural phenomena hazards (NPH) events also have the potential for exposing radiological materials due to fires, explosions, and spills; however, these events would tend to affect multiple DEFINED AREAS and are therefore covered with the Area G above-ground MAR LCO.</p>
LCO	<p>MAR SHALL be limited as follows:</p> <ol style="list-style-type: none">1. TRU WASTE in all DEFINED AREAS within BUILDING 54-412: ≤ 56 PE-Ci EQUIVALENT COMBUSTIBLE WASTE2. TRU WASTE in PROCESS AREAS:<ol style="list-style-type: none">a. HE-RTR: $\leq 1,100$ PE-Cib. Other individual PROCESS AREAS (e.g., Mobile loading, Drum Venting): $\leq 1,100$ PE-Ci eachc. Pad 10 PROCESS AREA (HENCs, Super HENC, RTR, TEUs, and other waste characterization/assay processes located on Pad 10): $\leq 4,000$ PE-Ci total3. TRU WASTE in a STORAGE AREA with one or more non-COMPLIANT METAL or non-METAL containers: $\leq 2,000$ PE-Ci

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.4 STORAGE AREA, TRITIUM AREA, and PROCESS AREA MAR

4. TRU WASTE in a STORAGE AREA with only COMPLIANT METAL CONTAINERS: $\leq 22,000$ PE-Ci
5. TRITIUM WASTE in a TRITIUM AREA: $\leq 1,000,000$ tritium Ci
6. TRU WASTE SHALL not be stored in a Building or Dome containing a SSSR AREA (except as allowed by Note in LCO Area Applicability)

A STORAGE AREA or PROCESS AREA may contain intermingled low-level or mixed waste containers within the area, in addition to TRU WASTE. The MAR limit applies to all radioactive waste within a DEFINED AREA, except facility-generated job waste that has not yet been characterized as low-level waste. Multiple STORAGE AREAS, TRITIUM AREAS, and PROCESS AREAS can be established within TA-54, Area G and as long as each DEFINED AREA meets its associated controls (e.g., radiological material inventory limit and thermal separation distances).

Note that MAR in containers with a damage ratio of zero does not contribute to offsite dose consequences and is, therefore, excluded from the limits of this LCO. An example of such containers is certified Type B packages (see SC DESIGN FEATURE Section). It is notable that this exception is for certified Type B packages. If a Type B package's certification expires, this MAR may no longer be excluded from the MAR limit. For MAR in containers with a damage ratio greater than zero but less than one, the applicable damage ratio may be applied to the LCO limits. An example of such containers is a POC, which has a DR = 0.1 (see SC DESIGN FEATURE Section).

Certified Sealed Sources provide assurance that the radiological materials in these containers are not readily releasable. Containment of radiological material within a Certified Sealed Source ensures that the consequences of any given event are negligible. Typically a DR=0 could be assigned to these containers, if there are no accidental insults to these containers that would release the material to the environment. Certified sealed sources or special form capsules that conform to 49 CFR 173.469 or American National Standards Institute (ANSI) N43.6 provide for defense-in-depth by ensuring that the radiological material is not releasable.

It must be noted that some sealed sources at TA-54, Area G cannot be verified as being certified to 49 CFR173.469 and ANSI N43.6 requirements to survive accident conditions. Sealed sources are stored and managed via the Area G source control policy that complies with the source control policy specified in Article 431 of the DOE RadCon Manual through the Radiation Protection Program. Because the sealed sources at Area G have not been certified to resist release of radiological material under accident conditions, all sealed sources will be tracked and counted against the MAR limit of the DEFINED AREA in which they are located. Only sealed sources stored within a Pipe

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.4 STORAGE AREA, TRITIUM AREA, and PROCESS AREA MAR

Overpack Container will be subject to the reduced Damage Ratio allowed by DOE-STD-5506.

BUILDING 54-412

BUILDING 54-412 has a TRU WASTE MAR limit of 56 PE-Ci EQUIVALENT COMBUSTIBLE WASTE. DEFINED AREAS (e.g., SSSR AREAs, PROCESS AREAs) may be established within BUILDING 54-412 for processing of waste containers. These DEFINED AREAS would be required to be maintained in accordance with their specific DEFINED AREA controls, and any MAR within these areas would be credited against the total MAR inventory limit of 56 PE-Ci EQUIVALENT COMBUSTIBLE WASTE for BUILDING 54-412. Totaling the MAR within BUILDING 54-412 is required since the failure of the structure could result in affecting all DEFINED AREAS within the structure.

PROCESS AREAS

PROCESS AREAS were identified for the processing of TRU WASTE containers. Activities in these DEFINED AREAS consist of mobile loading operations, HE-RTR, non-destructive examination, assay, drum venting, handling, and temperature equilibration of containers.

The MAR limits of $\leq 1,100$ PE-Ci in HE-RTR and each of the other individual PROCESS AREAS, and $\leq 4,000$ PE-Ci total for the Pad 10 PROCESS AREA were established to mitigate the consequences of analyzed events. The total MAR limit for the Pad 10 PROCESS AREA accommodates the inventory staged for, or undergoing one or more NDA/NDE characterization processes (e.g., RTR, HENC, Super HENC, and Temperature Equilibrium Units).

TRU WASTE STORAGE AREAS

TRU WASTE STORAGE AREAS were identified for the storage of TRU WASTE containers. These DEFINED AREAS may be enclosed within a domed structure or may be exposed to the elements.

TRITIUM AREAS

TRITIUM AREAS were identified for the storage of tritium containers that do not qualify for disposal in a LAA. Tritium is stored in a matrix which limits its release. A fire of significant heat is required to release tritium from its matrix. Tritium is stored in these TRITIUM AREAS prior to further processing and/or disposal.

APPLICABILITY

This LCO is applicable during OPERATION and WARM STANDBY because those are the only MODES that allow MAR to be present.

The area Applicability applies to the DEFINED AREAS and TRU storage described in the LCO. Other DEFINED AREAS (e.g., SSSR AREA) are controlled via other MAR LCOs.

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.4 STORAGE AREA, TRITIUM AREA, and PROCESS AREA MAR

The collocated storage of TRU WASTE up to the SSSR AREA MAR limit is allowed for TRU WASTE staged in closed containers awaiting SSSR processing or removal of repackaged waste. This exception is allowed in order to support routine SSSR operations which include the staging and removal of repackaged waste in closed containers. This form and amount of MAR was considered in the safety analysis for all postulated accidents that involved SSSR AREAS with collocated MAR in storage.

CONDITION A and associated ACTIONS and COMPLETION TIMES

CONDITION A is entered when one or more of the LCO condition statements are not met.

Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory and then restoration to meet the limit. A separate CONDITION entry is allowed for each AFFECTED DEFINED AREA, which allows for separate tracking of each ACTION.

ACTION A.1 requires the IMMEDIATE stopping of the receipt of MAR inventory inside the AFFECTED DEFINED AREA, which represents the most conservative COMPLETION TIME available to the operator. The ACTION begins when the CONDITION is recognized and continuously pursued until the ACTION is complete.

NOTE: In Building 54-412, there can be DEFINED AREAS such as SSSR. Other LCO ACTIONS may also apply to the DEFINED AREAS within the physical structure of Building 54-412.

ACTION A.2 requires that the AFFECTED DEFINED AREA be placed in WARM STANDBY within 2 hr. This ACTION places the AFFECTED DEFINED AREAS into a SAFE CONFIGURATION, which minimizes accident initiators and stops NON-ESSENTIAL ACTIVITIES. This ACTION reduces the accident risk to a very low level as rapidly as possible and minimizes the potential for accident conditions to impact the excess MAR. The 2 hr COMPLETION TIME is very short compared to the frequency of postulated accidents (spills, fires, etc.), yet it is sufficient time to safely make the MODE transition.

ACTION A.3 requires the MAR inventory in the AFFECTED AREA to be reduced to within LCO limits within 7 days. This ACTION restores compliance with the LCO. Seven days is sufficient time to plan and execute activities necessary to restore the MAR to (or below) the limit. 7 days is a relatively short time period compared with the unmitigated frequency of accidents analyzed in the BIO.

CONDITION B and associated ACTIONS and

CONDITION B is entered when TRU WASTE is determined to be stored in a Building or Dome containing a SSSR AREA except as allowed for under the LCO area applicability section. Under this CONDITION, the following

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.4 STORAGE AREA, TRITIUM AREA, and PROCESS AREA MAR

COMPLETION TIMES

ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory and to restore the LCO requirements. A separate CONDITION entry is required for each AFFECTED Building or Dome.

ACTION B.1 requires the IMMEDIATE stopping of the receipt of TRU MAR inventory into all DEFINED AREAS within the AFFECTED Building or Dome. That represents the most conservative COMPLETION TIME available to the operator. The ACTION begins when the CONDITION is recognized and continuously pursued until the ACTION is complete. The ACTION averts an increase in the magnitude of potential radiological material releases involving MAR in DEFINED AREAS within the AFFECTED Building or Dome during accident conditions beyond that analyzed in the accident analysis.

ACTION B.2 requires that all DEFINED AREAS within the AFFECTED Building or Dome be placed in WARM STANDBY IMMEDIATELY. This ACTION places the DEFINED AREAS within the AFFECTED Building or Dome into a SAFE CONFIGURATION, which minimizes accident initiators and stops NON-ESSENTIAL ACTIVITIES. This ACTION reduces the accident risk to a very low level as rapidly as possible and minimizes the potential for accident conditions to impact the excess MAR. The COMPLETION TIME of IMMEDIATELY stresses the importance of completing this ACTION as soon as possible.

ACTION B.3 requires that stored TRU WASTE be removed from the AFFECTED Building or Dome within 7 days. This ACTION restores compliance with the LCO. Seven days is sufficient time to plan and execute activities necessary to remove the stored TRU WASTE. 7 days is a relatively short time period compared with the unmitigated frequency of accidents analyzed in the BIO.

SURVEILLANCE REQUIREMENTS

SR 4.1.4.1

This SR requires VERIFICATION that the total TRU WASTE inventory in the DEFINED AREAS within BUILDING 54-412 is ≤ 56 PE-Ci EQUIVALENT COMBUSTIBLE WASTE prior to introduction of MAR into BUILDING 54-412. The database inventory can be used in this VERIFICATION. This SR is intended to prevent exceeding the MAR inventory limit in BUILDING 54-412.

The FREQUENCY of prior to introduction of MAR in to BUILDING 54-412 is judged to be the most effective and conservative performance period for this SR.

SR 4.1.4.2

This SR requires VERIFICATION that the TRU WASTE inventory in the stated HE-RTR AREA remains $\leq 1,100$ PE-Ci prior to introduction of MAR inventory into the HE-RTR AREA. The database inventory can be used in this

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.4 STORAGE AREA, TRITIUM AREA, and PROCESS AREA MAR

- VERIFICATION. This SR is intended to prevent exceeding the MAR inventory limit in the HE-RTR AREA. Performing this VERIFICATION prior to the introduction of MAR is the most conservative FREQUENCY to ensure that the HE-RTR AREA does not exceed its allowable limit.
- SR 4.1.4.3 This SR requires VERIFICATION that the TRU WASTE inventory in each of the other individual PROCESS AREAS remains $\leq 1,100$ PE-Ci prior to introduction of MAR inventory into each individual PROCESS AREA. The database inventory can be used in this VERIFICATION. This SR is intended to prevent exceeding the MAR inventory limit in each individual PROCESS AREA. Performing this VERIFICATION prior to the introduction of MAR is the most conservative FREQUENCY to ensure that each individual PROCESS AREA does not exceed its allowable limit.
- SR 4.1.4.4 This SR requires VERIFICATION that the TRU WASTE inventory in the Pad 10 PROCESS AREA remains $\leq 4,000$ PE-Ci prior to introduction of MAR inventory into the Pad 10 PROCESS AREA. The database inventory can be used in this VERIFICATION. This SR is intended to prevent exceeding the MAR inventory limit in the Pad 10 PROCESS AREA. Performing this VERIFICATION prior to the introduction of MAR is the most conservative FREQUENCY to ensure that the Pad 10 PROCESS AREA does not exceed its allowable limit.
- SR 4.1.4.5 This SR requires quarterly VERIFICATION that the TRU WASTE inventory in STORAGE AREA with one or more non-COMPLIANT METAL or non-METAL CONTAINERS is $\leq 2,000$ PE-Ci prior to the introduction of MAR into the respective STORAGE AREA. The database inventory can be used in this VERIFICATION. The SR is considered complete when the inventory is determined, which may be several days after the data is obtained. The quarterly SR FREQUENCY is acceptable because the total inventory in the STORAGE AREA with one or more non-COMPLIANT METAL CONTAINERS or non-METAL CONTAINERS is typically much less than the limit, and based upon historical waste activity data this level is not expected to be exceeded in a three-month period, especially since there are other activities that track receipt and movement of waste.
- SR 4.1.4.6 This SR requires quarterly VERIFICATION that the TRU WASTE inventory in each STORAGE AREA with only COMPLIANT METAL CONTAINERS is $\leq 22,000$ PE-Ci. The database inventory can be used in this VERIFICATION. The SR is considered complete when the inventory is determined, which may be several days after the data is obtained. The quarterly SR FREQUENCY is acceptable because the total inventory in the STORAGE AREA with only COMPLIANT METAL CONTAINERS is typically much less than the limit, and based upon historical waste activity data this level is not expected to be exceeded in a three-month period, especially since there are other activities that track receipt and movement of waste.
- SR 4.1.4.7 This SR requires quarterly VERIFICATION that the TRITIUM WASTE inventory in each TRITIUM AREA (e.g., Bldg. 54-1027, Bldg. 54-1028, Bldg.

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.4 STORAGE AREA, TRITIUM AREA, and PROCESS AREA MAR

54-1030, or Bldg. 54-1041) is $\leq 1,000,000$ tritium Ci. The database inventory can be used in this VERIFICATION. The SR is considered complete when the total inventory is determined, which may be several days after the data is obtained. The receipt of TRITIUM WASTE is infrequent (approx. once every six months), therefore a SR FREQUENCY of once every three months is an adequate period.

SR 4.1.4.8

This SR requires monthly VERIFICATION that TRU WASTE is not stored in a Building or Dome containing a SSSR AREA. The monthly FREQUENCY is acceptable because TRU WASTE transportation and storage operations are performed in accordance with the LANL Work Authorization process which includes appropriate reviews and approvals including Unreviewed Safety Question Determination (USQD) to ensure that safety basis requirements are not impacted as a result of facility changes. Additionally, the implementation of this type of control typically includes the use of signs or postings to alert workers to the existence of safety basis restrictions related to TRU WASTE storage in a given area. The use of such signs or posting further reduces the potential for human error. As such, TRU WASTE storage in an area not allowed under the safety basis would be a low probability event. Therefore, a SR FREQUENCY of monthly to verify that TRU WASTE is not stored in a Building or Dome containing a SSSR AREA is an adequate period.

REFERENCES

None

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.5 RETRIEVAL AREAS

APPLICATION TO SAFETY ANALYSIS	<p>RETRIEVAL AREAS were identified for the retrieval of TRU WASTE containers from Pit 9 and Trenches A through D. These are DEFINED AREAS where TRU WASTE containers are buried. Activities in these areas will consist of removing dirt and/or covers to provide access to the containers, attachment of devices and/or restraints to permit removal of the container from the area, and then the lifting/removal of the container from the pit or trench. By limiting the amount of material, a process upset could only release that amount for which public, collocated worker, and worker consequences have been evaluated. This control addresses fire, explosion, and spill events,</p>
LCO	<p>EXPOSED MAR in each RETRIEVAL AREA SHALL be $\leq 1,500$ PE-Ci.</p> <p>The below-ground inventory includes various wastes that have been disposed of (in pits and shafts) or otherwise stored at TA-54, Area G. Some of the TRU WASTE that is stored at TA-54, Area G was placed below-ground in Pit 9 and Trenches A through D. The Trenches A through D operation involves the retrieval of UNVENTED TRU WASTE DRUMS from vertical casks. Pit 9 contains unvented drums and boxes of TRU WASTE placed below grade on an asphalt pad using a “dense pack array” to store the containers. This array consists of FRPs that were placed to form cells within the unit. Waste drums (e.g., 30, 55, 85-gal) were placed in these cells. Historical information indicates that successive cells may have been separated by sheets of plywood, plastic and dirt. The entire configuration was then covered with plywood sheets, heavy vinyl sheeting, and approximately 1 m (3 ft) of soil.</p> <p>The LCO stipulates that only the ‘EXPOSED’ MAR is counted. For the purposes of this LCO, this excludes MAR that is covered by ≥ 3 in. of dirt or equivalent. Material that is covered by greater than or equal to 3 in. of dirt or equivalent barrier is not counted against the inventory limits as this depth of dirt is sufficient to prevent the buried waste from burning, as described in the Area G BIO, Section 3.3.2.3.2.2-H.</p>
APPLICABILITY	<p>This LCO is applicable in OPERATION and WARM STANDBY MODES because those are the only MODES that allow MAR to be present.</p> <p>The Area Applicability is the Area G RETRIEVAL AREAS – Pit 9 and Trenches A-D only. CMPs will be retrieved but are not included as a RETRIEVAL AREA because the source term (ARF, RF, DR) and, thus, dose consequences are low to the receptors since the MAR is essentially not-dispersible.</p>
CONDITION A and associated ACTIONS and	<p>CONDITION A is entered when the MAR inventory in a Pit 9 RETRIEVAL AREA exceeds 1,500 PE-Ci. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in</p>

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.5 RETRIEVAL AREAS

COMPLETION TIMES risk associated with the elevated inventory and to restore the LCO limit. A separate CONDITION entry is allowed for each RETRIEVAL AREA.

ACTION A.1 requires that the removal of the overburden/cover over the waste containers be stopped in the AFFECTED RETRIEVAL AREA IMMEDIATELY. The requirement to perform this ACTION IMMEDIATELY represents the most conservative COMPLETION TIME available to the operator. This compensatory measure prevents further MAR from being un-covered/EXPOSED, which limits the amount of MAR that is directly susceptible to accident initiators.

ACTION A.2 requires that the AFFECTED RETRIEVAL AREA be placed in WARM STANDBY within 2 hr. This ACTION places the AFFECTED DEFINED AREAS into a SAFE CONFIGURATION, which minimizes accident initiators and stops NON-ESSENTIAL ACTIVITIES. This ACTION reduces the accident risk to a very low level as rapidly as possible and minimizes the potential for accident conditions to impact the excess MAR. The 2 hr COMPLETION TIME is very short compared to the frequency of postulated accidents, yet it is sufficient time to safely make the MODE transition.

ACTION A.3 requires the MAR inventory in the AFFECTED RETRIEVAL AREA be reduced to less than or equal to 1,500 PE-Ci within 7 days. This restores compliance with the LCO. The COMPLETION TIME of 7 days is judged by facility personnel to be necessary to plan and execute activities necessary to restore the MAR to (or below) the limit. 7 days is relatively short compared to the frequency of accidents as analyzed in the BIO.

CONDITION B and associated ACTIONS and COMPLETION TIMES CONDITION B is entered when the MAR inventory in one or more of the Trenches A-D RETRIEVAL AREAS exceed 1,500 PE-Ci. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory and to restore the LCO limit. A separate CONDITION entry is allowed for each RETRIEVAL AREA.

ACTION B.1 requires that the removal of the cask lids be stopped in the AFFECTED RETRIEVAL AREA IMMEDIATELY. The requirement to perform this ACTION IMMEDIATELY represents the most conservative COMPLETION TIME available to the operator. This compensatory measure prevents further MAR from being uncovered/EXPOSED, which limits the amount of MAR that is directly susceptible to accident initiators.

ACTION B.2 requires that the AFFECTED RETRIEVAL AREA be placed in WARM STANDBY within 2 hr. This ACTION places the AFFECTED DEFINED AREAS into a SAFE CONFIGURATION, which minimizes accident initiators and stops NON-ESSENTIAL ACTIVITIES. This

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.5 RETRIEVAL AREAS

ACTION reduces the accident risk to a very low level as rapidly as possible and minimizes the potential for accident conditions to impact the excess MAR. The 2 hr COMPLETION TIME is very short compared to the frequency of postulated accidents, yet it is sufficient time to safely make the MODE transition.

ACTION B.3 requires the MAR inventory in the AFFECTED RETRIEVAL AREA be reduced to less than or equal to 1,500 PE-Ci within 72 hr. This restores compliance with the LCO. The COMPLETION TIME of 72 hr is judged by facility personnel to be necessary to plan and execute activities necessary to restore the MAR to (or below) the limit. 72 hr is short compared to the frequency of accidents as analyzed in the BIO.

SURVEILLANCE REQUIREMENTS

SR 4.1.5.1

This SR requires VERIFICATION that the planned retrieval in a RETRIEVAL AREA will only expose $\leq 1,500$ PE-Ci, prior to exposing (e.g., uncovering) MAR in an individual RETRIEVAL AREA. The database inventory can be used in this verification. The FREQUENCY requirement of prior to exposing MAR in the individual RETRIEVAL AREA VERIFIES planned retrieval activities and will not exceed the LCO limit. This surveillance ensures that with the planned MAR addition, the MAR inventory in an individual RETRIEVAL AREA will remain $\leq 1,500$ PE-Ci.

REFERENCES

None

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.6 Area G Site Above-Ground MAR Limits

APPLICATION TO SAFETY ANALYSIS The radioactive waste inventory controls serves to maintain operations within the assumptions of the Basis for Interim Operation. The safety function of the Area G Site Above-Ground MAR limit is to mitigate the consequences of the hazard events (such as wildland fire) that could involve the entire TA-54, Area G above-ground site inventory.

MAR limits help to limit the potential radiological dose consequences from an accident that releases material by spill or fire. To determine the dose consequences, the calculated accident source terms depend on the quantity of TRU WASTE, the waste matrix composition (i.e., the percentages of combustible-dispersible, noncombustible-dispersible, and noncombustible-nondispersible material), the damage ratio, and the airborne release fraction and the respirable fraction (ARF_xRF) specified by DOE-STD-5506 for each material composition.

The MAR limits for some TRU WASTE DEFINED AREAS, such as SSSR AREAS and Bldg 54-412, are based on EQUIVALENT COMBUSTIBLE PE-CIs of TRU WASTE, with the safety analysis assuming the entire MAR inventory for that area is 100% combustible, and subject to the worst case ARF_xRF. For PROCESS AREA and STORAGE AREA analyses, the MAR limit for the particular area and the actual waste matrix composition is used.

For METAL CONTAINERS, the accident analysis assumes the total above ground TRU WASTE inventory is 57,000 PE-Ci (the site MAR limit) and the waste matrix composition is 3.06% combustible-dispersible, 3.89% non-combustible-dispersible, and 93.04% noncombustible-nondispersible material. As the above-ground site inventory decreases with removal of material from Area G, the waste matrix composition will vary over time.

To ensure that the accident analysis remains bounding as waste inventory quantity and waste matrix composition changes in the future, a periodic verification of the effect of less MAR combined with possibly higher combustible waste matrix composition is required. To perform this verification, a composite source term (column g) is calculated with the actual site TRU WASTE inventory (column a) multiplied by the actual waste matrix fraction (column c), and the fixed damage ratio and ARF_xRF shown below. Because there is no credible accident that would burn 100% of the entire above-ground TRU WASTE inventory, the individual accident analyses in the BIO will remain bounding if this composite source term is ≤ 1.06 PE-Ci.

	a	b	c	d	e	f	g
Accident Component	Site TRU MAR (PE-Ci)	Waste Matrix Composition	Waste Matrix Fraction	Damage Ratio	ARF _x RF	Source Term (ST) (PE-Ci)	Total ST (PE-Ci)
Source Terms from entire above ground inventory in a site-wide fire							
Confined burning of entire site inventory in metal TRU WASTE containers	57,000	C, D	3.06%	1.0	5.E-04	0.873	1.06
	57,000	NC, D	3.89%	1.0	6.E-05	0.133	
	57,000	NC, ND	93.04%	1.0	1.E-06	0.053	

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.6 Area G Site Above-Ground MAR Limits

This control addresses wildland fire and seismic events.

LCO

Note that MAR in containers with a damage ratio of zero does not contribute to offsite dose consequences and is, therefore, excluded from the limits of this LCO. An example of such containers is certified Type B packages (see SC DESIGN FEATURE Section). It is notable that this exception is for certified Type B packages. If a Type B package's certification expires, this MAR may no longer be excluded from the MAR limit. The note also states that for MAR in containers with a damage ratio greater than zero but less than one, the applicable damage ratio may be applied to the LCO limits. An example of such containers is a POC, which has a DR = 0.1 (see SC DESIGN FEATURE Section).

Certified Sealed Sources provide assurance that the radiological materials in these containers are not readily releasable. Containment of radiological material within a Certified Sealed Source ensures that the consequences of any given event are negligible. Typically a DR=0 could be assigned to these containers, if there are no accidental insults to these containers that would release the material to the environment. Certified sealed sources or special form capsules that conform to 49 CFR 173.469 or American National Standards Institute (ANSI) N43.6 provide for defense-in-depth by ensuring that the radiological material is not releasable.

It must be noted that some sealed sources at TA-54, Area G cannot be verified as being certified to 49 CFR 173.469 and ANSI N43.6 requirements to survive accident conditions. Sealed sources are stored and managed via the Area G source control policy that complies with the source control policy specified in Article 431 of the DOE RadCon Manual through the Radiation Protection Program. Because the sealed sources at Area G have not been certified to resist release of radiological material under accident conditions, all sealed sources will be tracked and counted against the site MAR limits for TRU waste. Only sealed sources stored within a Pipe Overpack Container will be subject to the reduced Damage Ratio allowed by DOE-STD-5506.

1. The total above-ground TRU MAR inventory SHALL be $\leq 57,000$ PE-Ci

AND

2. The total above-ground TRITIUM WASTE MAR inventory SHALL be $\leq 4,000,000$ tritium Ci

AND

3. All above-ground MAR SHALL be located inside a DEFINED AREA appropriate to the waste and container type.

The total Area G site above-ground TRU MAR inventory in all waste forms SHALL be $\leq 57,000$ PE-Ci. This limit excludes the site tritium curie content, which is controlled separately. The total Area G site above-ground tritium MAR inventory SHALL be $\leq 4,000,000$ tritium Ci (note: this includes the

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.6 Area G Site Above-Ground MAR Limits

total EXPOSED TRITIUM-CONTAMINATED WASTE inventory in LAAs and the total TRITIUM WASTE inventory in TRITIUM AREAS). Area G was identified to limit the total quantity of radiological material that may be located within the facility. The limit of less than or equal to 57,000 PE-Ci of TRU is based on the amount of radiological material currently stored above-ground and provides for an additional capacity to support the retrieval of below-ground MAR for processing and shipment offsite. Above-ground material is counted against this inventory and includes all EXPOSED MAR in all DEFINED AREAS.

Item 3 of this LCO requires that all above-ground MAR be located inside a DEFINED AREA appropriate to the waste and container type. This LCO is specified to protect the following assumption of the accident analysis: the specific Area G site locations where radioactive material releases are evaluated to occur are inside process and storage areas which are designated as DEFINED AREAS. The LCO location requirement does not apply to MAR in TRANSPORT or MAR inside certified Type B containers.

APPLICABILITY

This LCO is applicable in the OPERATION and WARM STANDBY MODES at Area G because those are the only MODES that allow MAR to be present. This LCO is applicable to all above-ground locations at Area G.

CONDITION A and associated ACTIONS and COMPLETION TIMES

CONDITION A is entered when the total Area G site above-ground MAR inventory exceeds 57,000 PE Ci. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory and to restore the LCO limit.

ACTION A.1 requires that radiological inventory additions to the above-ground TRU MAR inventory at TA-54, Area G site be stopped IMMEDIATELY, which represents the most conservative COMPLETION TIME available to the operator. This includes receipt of newly shipped TRU MAR inventory to TA-54, Area G and any TRU MAR inventory that may be retrieved from underground storage within Area G. The ACTION averts an increase in the magnitude of potential radiological material releases from the TA-54, Area G site during accident conditions that could impact the total inventory of the site.

ACTION A.2 requires the above-ground TRU MAR inventory to be reduced to $\leq 57,000$ PE-Ci within 31 days. This ACTION restores compliance with the LCO. Per facility personnel judgment 31 days is sufficient time to plan and execute activities necessary to restore the MAR to (or below) the limit. While the COMPLETION TIME of 31 days is a relatively long period of time compared to some of the analyzed accidents in the BIO, an accident occurring during this time is not likely. Removal of TRU MAR will entail arranging for of the TRU WASTE to be received elsewhere and confirming compliance with acceptance criteria at the arranged destination. Thirty-one days is a minimum time needed for these activities to take place.

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.6 Area G Site Above-Ground MAR Limits

CONDITION B and associated ACTIONS and COMPLETION TIMES

CONDITION B is entered when the total above-ground tritium MAR inventory exceeds 4,000,000 tritium Ci. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory and to restore the LCO limit.

ACTION B.1 requires that tritium inventory additions to the above-ground TRITIUM WASTE MAR inventory be stopped IMMEDIATELY, which represents the most conservative COMPLETION TIME available to the operator. This includes receipt of newly shipped Tritium MAR inventory to Area G and any tritium MAR inventory that may be retrieved from underground storage within Area G. This ACTION averts an increase in the magnitude of potential radiological material releases from the TA-54, Area G site during accident conditions that could impact the total tritium inventory of the site.

ACTION B.2 requires that all areas with tritium (e.g., TRITIUM AREAS, TRITIUM TRANSPORTATION VEHICLES) be placed in WARM STANDBY within 2 hr. This ACTION places the AFFECTED DEFINED AREAS into a SAFE CONFIGURATION, which minimizes accident initiators and stops NON-ESSENTIAL ACTIVITIES. This ACTION reduces the accident risk to a very low level as rapidly as possible and minimizes the potential for accident conditions to impact the excess MAR. The 2-hr COMPLETION TIME is very short compared to the frequency of postulated accidents, yet it is sufficient time to safely make the MODE transition.

ACTION B.3 requires the above-ground TRITIUM WASTE MAR inventory to be reduced to $\leq 4,000,000$ tritium Ci within 7 days. This ACTION restores compliance with the LCO. Per facility personnel judgment 7 days is sufficient time to plan and execute activities necessary to restore the MAR to (or below) the limit. 7 days is a relatively short time period compared with the unmitigated frequency of accidents analyzed in the BIO.

CONDITION C and associated ACTIONS and COMPLETION TIMES

CONDITION C is entered when the calculated product of the actual above-ground TRU WASTE inventory and the waste matrix composition results in a composite source term > 1.06 PE-Ci. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the elevated inventory/waste matrix composition combination.

ACTION C.1 requires that inventory additions to the above-ground TRU MAR inventory at TA-54, Area G site be stopped IMMEDIATELY, which represents the most conservative COMPLETION TIME available to the operator. This includes receipt of newly shipped TRU MAR inventory to TA-54, Area G and any TRU MAR inventory that may be retrieved from underground storage within Area G. The ACTION averts an increase in the magnitude of potential material releases from the TA-54, Area G site during accident conditions that could impact the total inventory of the site.

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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.6 Area G Site Above-Ground MAR Limits

ACTION C.2 requires above-ground TRU WASTE inventory and/or the waste matrix composition be reduced until the calculated product of the actual TRU WASTE inventory and the actual waste matrix composition results in a total composite source term < 1.06 PE-Ci. Reduction through the removal of TRU WASTE MAR from the Area G site will entail arranging for the TRU WASTE to be received elsewhere and confirming compliance with acceptance criteria at the arranged destination. Reducing the percentage of combustible-dispersible waste remaining onsite, and/or reducing the total site TRU WASTE inventory will reduce the composite source term to ensure that the accident analysis consequences remain bounding. The reduction effort will begin IMMEDIATELY and continue until the ACTION is completed, so that receipt of TRU WASTE at Area G may be resumed.

CONDITION D and associated ACTIONS and COMPLETION TIMES

CONDITION D is entered when above-ground MAR is not located inside a DEFINED AREA appropriate to the waste and container type. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for not meeting the LCO condition statement.

ACTION D.1 requires that NON-ESSENTIAL ACTIVITIES within 15 ft of the AFFECTED MAR be stopped IMMEDIATELY, which represents the most conservative COMPLETION TIME available to the operator. Stopping NON-ESSENTIAL ACTIVITIES will minimize activities that may impact the AFFECTED MAR and cause a release. A 15-ft isolation distance is established consistent with the definition of an ISOLATION AREA to minimize the probability that any operation could inadvertently impact the AFFECTED MAR causing a release.

ACTION D.2 requires that the AFFECTED MAR be placed inside the appropriate DEFINED AREA within 7 days. This ACTION restores compliance with the LCO. Per facility personnel judgment, 7 days is sufficient time to plan and execute activities necessary to place the AFFECTED MAR inside the appropriate DEFINED AREA. The COMPLETION TIME of 7 days is a relatively short period of time compared to some of the analyzed accidents in the BIO; thus, an accident occurring during this time is not likely. Placing the AFFECTED MAR into the appropriate DEFINED AREA entails arranging for of the waste to be moved to the appropriate DEFINED AREA, performing the move, and confirming compliance with acceptance criteria at the DEFINED AREA that receives the MAR.

SURVEILLANCE REQUIREMENTS

SR 4.1.6.1

This SR requires an annual VERIFICATION that the total above-ground TRU WASTE inventory at TA-54, Area G site is less than or equal 57,000 PE Ci. This SR VERIFIES the requirement of LCO statement #1 is met. The

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.6 Area G Site Above-Ground MAR Limits

	<p>SR is considered complete when the inventory is determined which may be several days after the data are obtained. The Annual SR FREQUENCY is acceptable because the total inventory at Area G is typically much less than the limit, and based upon historical waste activity data this level is not expected to be exceeded especially since there are other activities that track receipt, movement and retrieval of waste at TA-54, Area G. Also, the MAR limits for each individual DEFINED AREA are VERIFIED more frequently as described in LCOs/SRs 3.1.1-3.1.5. Since the most likely result of a SR is satisfactory performance, then meeting the SRs for the individual DEFINED AREAS described in LCOs/SRs 3.1.1-3.1.5 gives confidence that the total Area G limits are met in between annual surveillances.</p>
SR 4.1.6.2	<p>This SR requires an annual VERIFICATION that the total above-ground TRITIUM WASTE MAR inventory at TA-54, Area G site is less than or equal 4,000,000 tritium Ci. This SR VERIFIES the requirement of LCO statement #2 is met. The SR is considered complete when the total inventory is determined which may be several days after the data are obtained. The receipt of TRITIUM WASTE is infrequent (approx. once every six months), therefore the COMPLETION TIME of at least once a year is adequate period for conducting this SR.</p>
SR 4.1.6.3	<p>This SR requires an annual VERIFICATION that the product of the actual above-ground site TRU WASTE inventory and the actual waste matrix composition results in a composite source term ≤ 1.06 PE-Ci (as described above, in the Application to Safety Analysis for this LCO).</p>
SR 4.1.6.4	<p>This SR requires an annual inspection to VERIFY that MAR is located inside a DEFINED AREA appropriate to the waste and container type. This SR VERIFIES the requirement of LCO statement #3 is met. The Annual SR FREQUENCY is acceptable because the storage and processing of waste at Area G is also governed by environmental regulations that require the regular inspection of regulated waste to ensure that it is properly managed and stored in approved (permitted) locations. Given these regular inspections, it is considered extremely unlikely that MAR would be found outside of a permitted area. Given this low probability and the regular environmental inspections that are performed, the Annual SR FREQUENCY is considered acceptable.</p>

REFERENCES	None
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A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.7 TRU WASTE Drum DOUBLEPACK

BACKGROUND SUMMARY	<p>The majority of MAR that exists in TA-54, Area G is TRU WASTE contained in drums. DOUBLEPACKING provides additional protection against fires, internal deflagrations, external impacts, and other mechanisms that would result in a release of MAR.</p> <p>There are multiple options for DOUBLEPACKING DRUMS into a larger container. For example, a 30-gal drum can be DOUBLEPACKED into a 55-gal drum. A 55-gal drum can be DOUBLEPACKED into an 85-gal drum. An 85-gal drum can be DOUBLEPACKED into a 110-gal drum. Drums of any size can be DOUBLEPACKED into a SWB.</p>
APPLICATION TO SAFETY ANALYSIS	<p>DOUBLEPACKING provides an additional barrier between the radioactive waste and the environment. DOE-STD-5506 indicates that unvented drums that are DOUBLEPACKED can be modeled as a confined burn with a DR=0.1 because there is no lid loss and ejection of contents. This reduces the ST that is released in a postulated event and, therefore, reduces the consequences to the public, collocated workers, and facility workers. This control addresses fire, explosion, spill, external, and NPH events.</p>
LCO	<p>Above-ground TRU WASTE Drums with ≥ 200 PE-Ci SHALL be DOUBLEPACKED. DOUBLEPACKING only applies to TRU WASTE drums. Due to the inherent robust design and construction of the SWBs, they are not required to be DOUBLEPACKED. Containers that are not structurally sound (e.g., may have a pin hole leak) can be placed in another TRU WASTE container and be considered OVERPACKED but no DR reduction can be taken because it is not DOUBLEPACKED. Containers can be inspected for structural integrity prior to placement into a DOUBLEPACK. Once DOUBLEPACKED, there is no effective means to periodically reassess the integrity of the original container. However, the outer container would protect the inner from compromise as long as the outer container remains of sound integrity.</p>
APPLICABILITY	<p>This LCO applies in OPERATION and WARM STANDBY. This LCO is applicable to both MODES because MAR is present and the potential for accidents such as a fire or deflagration to impact the MAR exists in both MODES. Furthermore, the LCO applies to all above-ground DEFINED AREAS, excluding RETRIEVAL AREAS. RETRIEVAL AREAS are excluded because the requirement for DOUBLEPACKING TRU WASTE drums at RETRIEVAL AREAS with MAR ≥ 200 PE-Ci is covered in a Directive Action Specific Administrative Control (SAC). Cemented and vitrified waste forms are excluded from this LCO since they are not readily dispersible (i.e., have very low damage ratios and ARF*RFs). A POC provides equivalent or better protection than a DOUBLEPACK. As described in DOE-STD-5506-2007, POCs are highly resistant to fire, deflagration or loss of confinement due to impact, with a Damage Ratio of 0 for most evaluated insults. Hence, waste packaged in a POC is not required to be DOUBLEPACKED. The temporary removal of a drum from a DOUBLEPACK during repackaging or characterization with a High Energy Neutron Counter (HENC) or other NDA device, or during SSSR is allowed.</p>

APPENDIX A BASES

A3.1 RADIOLOGICAL INVENTORY MANAGEMENT

A3.1.7 TRU WASTE Drum DOUBLEPACK

CONDITION A and associated ACTIONS and COMPLETION TIMES	<p>Also excluded are the drums with > 300 PE-Ci that were overpacked according to the requirements of the Area G <i>Documented Safety Analysis</i> approved in 2003. These overpacked, vented containers were considered compliant at the time and are considered to have been protected from exposure to ambient environmental conditions and to have retained their sound integrity.</p> <p>A separate CONDITION entry is allowed for each AFFECTED TRU WASTE drum. This allows for the ACTIONS to be entered and tracked separately for multiple drums that are not in compliance with the LCO condition statements.</p> <p>CONDITION A is entered when an above-ground TRU WASTE drum with ≥ 200 PE-Ci is not DOUBLEPACKED. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for not meeting the LCO condition statement.</p> <p>ACTION A.1 requires that the AFFECTED drum be isolated from other drums by a distance of ≥ 7ft within 4 hr. Seven feet is sufficient distance to prevent propagation of fire between metal drums. To isolate the AFFECTED drum it may be separated from other drums either by moving other drums away from where the AFFECTED drum is located, or moving the AFFECTED drum to another location. The 4 hr COMPLETION TIME is a reasonable maximum time to complete any necessary drum/container movements.</p> <p>ACTION A.2 requires that the AFFECTED drum be DOUBLEPACKED within 7 days. This ACTION restores compliance with the LCO condition statement. The 7 day completion time allows sufficient time to safely DOUBLEPACK a drum once taken above ground in a RETRIEVAL AREA. In addition, the 7-day COMPLETION TIME is very short compared to the frequency of accidents such as fires and deflagrations which could impact the MAR within an AFFECTED drum. For example, the analyzed frequency of a drum deflagration from the Chapter 3 accident analysis is in the Unlikely (10^{-2}-10^{-4}/yr bin).</p>
SURVEILLANCE REQUIREMENTS SR 4.1.7.1	<p>This SR requires quarterly VERIFICATION that above-ground drums with ≥ 200 PE-Ci TRU WASTE are DOUBLEPACKED. The SR may be accomplished through review of the Area G inventory database for those above-ground drum with ≥ 200 PE-Ci MAR.</p> <p>The FREQUENCY of quarterly is considered acceptable because newly received waste is required to meet the lower MAR WIPP WAC limits. Retrieved waste is subject to a separate SAC.</p>
REFERENCES	<p>DOE/WIPP-02-3122, <i>Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant</i>, June 2011</p>

APPENDIX A BASES

A3.2 FIRE PROTECTION CONTROLS

A3.2.1 Thermal Separation Distances

BACKGROUND SUMMARY

Minimum Thermal Separation Distances for applicable DEFINED AREAS (i.e., TRU STORAGE AREAS, PROCESS AREAS, TRITIUM AREAS, SSSR AREAS, and RETRIEVAL AREAS) are credited in the safety analysis to reduce the likelihood of fire progression between DEFINED AREAS and reduce the radiological consequences by limiting the amount of MAR involved.

Applicable DEFINED AREAS must be defined by identifying boundaries for the area. These boundaries may be defined by a fixed structure (e.g., walls of a dome or outline of a paved pad) or physically identified (e.g., painted line marking the perimeter of an applicable area, rope boundary, etc.) or the physical location in TA-54, Area G may define the area.

The required Minimum Thermal Separation Distance is also dependent on the types of containers located in the applicable DEFINED AREAS (i.e., METAL CONTAINERS versus non-metal containers) due to the differing thermal response of the different container types during a fire exposure.

APPLICABILITY TO SAFETY ANALYSIS

The safety function of the thermal separation distance is to reduce the likelihood of fire progression between DEFINED AREAS and reduce the radiological consequences by limiting the amount of MAR involved. The safety function is preventive as it reduces the likelihood that the initial fire progresses to involve additional DEFINED AREAS. The safety function is mitigative as it reduces radiological consequences by limiting the amount of radiological material released from the applicable DEFINED AREA.

This control was identified for fire events that involve two basic conditions. The first condition is a fire that occurs adjacent to an applicable DEFINED AREA containing radioactive waste. The second condition is a fire occurring within an applicable DEFINED AREA containing radioactive waste and affecting an adjacent applicable DEFINED AREA that contains radioactive waste. In both cases, maintenance of a Minimum Thermal Separation Distance reduces the likelihood that a fire in one location affects combustible material within an adjacent location. The safety analysis demonstrates that fire accidents are sufficiently mitigated when the control is applied to certain specific DEFINED AREAS. These applicable DEFINED AREAS include TRU STORAGE AREAS, PROCESS AREAS, TRITIUM AREAS, SSSR AREAS, and RETRIEVAL AREAS. This control is not applicable to LOW ACTIVITY AREAS since the safety analysis demonstrates that unmitigated radiological releases from LOW ACTIVITY AREAS together with the mitigated releases from all other DEFINED AREAS where the control is applied will not result in dose consequences that challenge the EG.

The safety analysis assumes that the leading edge of the fire is separated from containers by the separation distance. Combustible materials can be ignited when exposed to sufficient heat flux for a sufficient period of time by causing the temperature of the combustible material to rise to its ignition temperature. The composition and configuration of the adjacent waste will determine the

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A3.2 FIRE PROTECTION CONTROLS

A3.2.1 Thermal Separation Distances

heat flux necessary to result in its combustion. It has been determined that metal TRU WASTE drums must experience a heat flux of $\geq 45 \text{ kW/m}^2$ to cause drum lid failure. Non-METAL CONTAINERS, such as FRPs, require a heat flux of $\geq 10 \text{ kW/m}^2$ to cause ignition of the containers and their contents. The safety analysis determined that the specified Minimum Thermal Separation Distances, considering the activities and container types, were sufficient to limit the heat flux in adjacent areas to preclude fire spread to these areas.

LCO

This LCO requires the establishment of a Minimum Thermal Separation Distance for applicable DEFINED AREAS.

The Minimum Thermal Separation Distances for the following DEFINED AREAS are presented below:

1. TRU STORAGE AREAS, PROCESS AREAS and RETRIEVAL AREAS containing only METAL CONTAINERS and all TRITIUM AREAS SHALL have the following minimum Thermal Separation Distances:

Thermal Separation Distance with no LIQUID IMPEDIMENT	OR	Thermal Separation Distance with an established LIQUID IMPEDIMENT
22 ft		7 ft

2. TRU STORAGE AREAS, PROCESS AREAS and RETRIEVAL AREAS containing one or more non-METAL CONTAINERS SHALL have the following minimum Thermal Separation Distances:

Thermal Separation Distance with no LIQUID IMPEDIMENT	OR	Thermal Separation Distance with an established LIQUID IMPEDIMENT
43 ft		24 ft

3. An SSSR AREA SHALL have the following minimum Thermal Separation Distances:

With non-metal containers	OR	With non-metal containers with an established STATIONARY FIRE WATCH	OR	With only METAL CONTAINERS
24 ft		10 ft		10 ft

The Minimum Thermal Separation Distances shown above are conservatively based on the most conservative of either a 100-gal fuel pool fire or a crate fire

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A3.2 FIRE PROTECTION CONTROLS

A3.2.1 Thermal Separation Distances

involving ordinary combustibles and upon the thermal flux required to ignite different types of containers. For a fuel pool fire, a 100-gal pool fire is limiting since other TSR controls limit the fuel quantity that could affect the applicable DEFINED AREAS to this value.

The Minimum Thermal Separation Distances shown above where no LIQUID IMPEDIMENTS are established represent the distance from the edge of the pool fire necessary to prevent failure of METAL CONTAINERS or ignition of non-metal containers, plus the radius of the pool fire. This thus corresponds to the total distance between a fuel source and the applicable DEFINED AREA. The Minimum Thermal Separation Distances shown above where LIQUID IMPEDIMENTS are established represent the distance from the edge of the pool fire necessary to prevent failure of METAL CONTAINERS or ignition of non-metal containers.

The analysis conservatively assumes the liquid pool forms on a smooth, flat surface. Area G is actually uneven terrain with large unpaved areas that result in smaller fuel pool sizes. Implementation will ensure that the topography (e.g., grades or slopes) does not invalidate the assumptions of the accident analysis. A berm, curb, slope, ditch and/or equivalent liquid flow impediment may be used to limit the spread of a fuel pool fire from liquid fueled equipment or vehicles because the flow of the fuel is either stopped and/or is directed in such a way so to not impact waste within the applicable DEFINED AREA. In most cases, satisfying either of these Minimum Thermal Separation Distance criteria (i.e., with or without an established LIQUID IMPEDIMENT) will prevent fire propagation across the minimum thermal separation distance. For Thermal Separation Distances that slope downward *toward* a DEFINED AREA, a liquid impediment will be required to divert the liquid pool away from the DEFINED AREA and ensure the leading edge of a fuel pool would remain at least the minimum specified thermal separation distance from TRU WASTE in the DEFINED AREA in the event of a fuel pool fire.

By containing or diverting the spilled liquid, established LIQUID IMPEDIMENTS will prevent the failure of a container (such as a fuel tank) containing up to 100 gal of flammable liquids from impinging upon the minimum thermal separation distance. The 100 gal of liquid is assumed to be spilled at a rate of 25 gpm (rounded up from 24.24 gpm average leak rate from a punctured 100 gal tank, as calculated in CALC-11-TA-54-AREAG-009). 100 gal was selected because vehicles containing greater than 100 gal of fuel are under escort. Given the posted speed limit and other controls, a vehicle accident sufficiently energetic to cause a catastrophic failure of a fuel tank is not postulated.

In addition, the types of containers (e.g., metal vs. non-metal) within the applicable DEFINED AREA that contain radiological material must be identified. The following are considered examples of METAL CONTAINERS with metal outermost exteriors:

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A3.2 FIRE PROTECTION CONTROLS

A3.2.1 Thermal Separation Distances

- Drums
- SWBs
- Corrugated Metal Pipes
- Metal Boxes
- Transportainers
- Sea Land containers
- Tritium containers
- Ten-Drum Overpacks

The METAL CONTAINERS that are not drums are expected to perform as well (thermal response during a fire) as a metal drum due to the metal wall thickness of these other containers.

The following are considered examples of non-METAL CONTAINERS for these separation distances (containers that are considered combustible construction):

- Plastic-wrapped Waste
- Wood Boxes
- FRP Boxes

METAL CONTAINER and non-METAL CONTAINER mixes are bounded by non-metal container separation distances. The minimum thermal separation distance from non-metal containers is larger and conservatively protects the METAL CONTAINERS.

For an SSSR AREA with non-metal containers, the minimum thermal separation distance can be reduced to 10 ft provided a STATIONARY FIRE WATCH is present. When a non-METAL CONTAINER such as an FRP is being processed, it may not be feasible to provide a 24 ft separation distance. With a STATIONARY FIRE WATCH present, the distance may be reduced since the STATIONARY FIRE WATCH substantially reduces fire risk. Specifically, the STATIONARY FIRE WATCH is a person dedicated and trained to observe TA-54, Area G operations, watch for small and early developing fires, use fire extinguishing equipment/materials, and take appropriate emergency action along with TA-54, Area G operators, such as sounding the building alarm, summoning emergency assistance (e.g. pulling manual fire alarm, calling 911), and extinguishing fires.

APPLICABILITY

This LCO requirement is applicable in OPERATION and WARM STANDBY. This LCO is applicable in these MODES since MAR can be present in the applicable DEFINED AREAS. This LCO applies to the specified DEFINED AREAS, with the specific LCO requirements differentiated for each applicable DEFINED AREA depending on whether it contains METAL CONTAINERS, non-metal containers, or is an SSSR AREA. Additional notes as discussed below are also provided to further clarify applicability of the LCO.

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A3.2 FIRE PROTECTION CONTROLS

A3.2.1 Thermal Separation Distances

This LCO is not applicable to the following:

- 1) **DEFINED AREAS** containing only BG Spheres/metal spheres or CMPs. BG Spheres/metal spheres are robust containers and are not anticipated to result in releases, and CMPs have very low resulting dose consequences due to their lack of dispersible combustible material.
- 2) Items in transit to and from **DEFINED AREAS**. Items in transit (e.g., **TRANSIENT COMBUSTIBLES**, vehicles/equipment with liquid fuel and radioactive waste on a vehicle/equipment) are excluded from this LCO as well as liquid fuel containers entering or exiting a **DEFINED AREA**. The transient movement (e.g., forklifts of pallets with drums) through the separation distance is an **ATTENDED** process that mitigates the hazard, and there are separate LCO controls for flammable/combustible liquids entering a **DEFINED AREA**.
- 3) The distance between **EXPOSED MAR** and the impediment for liquid fueled retrieval equipment located at Pit 9 and Trenches A-D. Liquid fueled retrieval equipment located at Pit 9 and Trenches A-D will employ **LIQUID IMPEDIMENTs** to prevent a fuel pool fire originating from the equipment from involving the pit or trench. These **LIQUID IMPEDIMENT** controls are specified in LCO 3.2.3 and provide an equivalent control to this LCO, allowing the exclusion of these areas from the Applicability of this LCO.
- 4) **LOW ACTIVITY AREAS**. For postulated fire scenarios, the safety analysis did not credit thermal separation distances to mitigate potential radiological releases from **LOW ACTIVITY AREAS**. Hence, the safety analysis allows **LOW ACTIVITY AREAS** to be excluded from the Applicability of this LCO.

The minimum thermal separation distance that must be maintained is the shortest distance from a container surface inside an applicable **DEFINED AREA**. However, for ease of implementation it may be conservatively established as the measured distance from the boundary of the applicable **DEFINED AREA**. This will permit containers to be located anywhere within the applicable **DEFINED AREA** boundary without violating the analysis.

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A3.2 FIRE PROTECTION CONTROLS

A3.2.1 Thermal Separation Distances

CONDITION A and associated ACTIONS and COMPLETION TIMES	CONDITION A is entered when the minimum thermal separation distances are not met. Under this CONDITION, the following ACTIONS include compensatory measures to account for the increase in risk associated with the minimum separation distance not being met and to restore the LCO requirement. A separate entry CONDITION is allowed for each applicable DEFINED AREA.
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ACTION A.1 requires placing the AFFECTED TRU STORAGE AREA, PROCESS AREA, TRITIUM AREA, SSSR AREA, or RETRIEVAL AREA in WARM STANDBY IMMEDIATELY. This ACTION places the AFFECTED TRU STORAGE AREA, PROCESS AREA, TRITIUM AREA, SSSR AREA, or RETRIEVAL AREA into a SAFE CONFIGURATION, which minimizes fire initiators and stops NON-ESSENTIAL ACTIVITIES. This ACTION reduces the fire risk to a very low level as rapidly as possible and minimizes the potential for radiological material releases involving the MAR in more than one of the applicable DEFINED AREAS. The IMMEDIATE COMPLETION TIME represents the most conservative COMPLETION TIME available to the operator.

ACTION A.2.1 requires the establishment of a STATIONARY FIRE WATCH in the AFFECTED TRU STORAGE AREA, PROCESS AREA, TRITIUM AREA, SSSR AREA, or RETRIEVAL AREA within 2 hr. A STATIONARY FIRE WATCH compensates for the out-of-specification CONDITION by providing for the inspection of the AFFECTED areas for incipient fires such that appropriate notification and fire-fighting response may be initiated, thus minimizing the potential for fire involving more than one of the applicable DEFINED AREAS. The STATIONARY FIRE WATCH can also prevent or correct potential fire risk situations (e.g., unauthorized ignition sources) and can take measures to extinguish small fires. The COMPLETION TIME is as prompt as possible considering that experience has shown that this ACTION may take up to 2 hr due to personnel response times during call-out situations.

ACTION A.3 requires restoration of the Minimum Thermal Separation Distance to re-establish LCO compliance within 24 hr. Efforts required to complete this ACTION will likely require the movement of containers. Due to the potential for requiring multiple container movements, a 24-hr COMPLETION TIME is appropriate to properly plan the work, obtain resources, and safely execute the work, assuring the ACTION is safely completed without undue delay. A 24-hr COMPLETION TIME is also a very short period given the fire initiation frequency for AFFECTED areas.

SURVEILLANCE
REQUIREMENTS

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A3.2 FIRE PROTECTION CONTROLS

A3.2.1 Thermal Separation Distances

SR 4.2.1.1	This SR requires VERIFICATION that the Minimum Thermal Separation Distances are met on a monthly basis and prior to changing the container type (i.e., METAL CONTAINER versus non-metal container) in an applicable DEFINED AREA. The SR FREQUENCY of monthly is based on the relatively static nature of the boundaries for the applicable DEFINED AREAS. These boundaries do not change on a regular basis. Therefore, the monthly FREQUENCY is adequate to ENSURE that the Minimum Thermal Separation Distances will continue to be met. When the container types are changed in an applicable DEFINED AREA, the SR is performed to ENSURE continued compliance with the LCO.
SR 4.2.1.2	This SR requires VERIFICATION that a LIQUID IMPEDIMENT(s) is capable of containing or diverting 100 gal of liquid, upon establishment of a new LIQUID IMPEDIMENT. The SR ensures the configuration of the LIQUID IMPEDIMENT can contain or divert 100 gal of liquid leaking at an average rate of 25 gpm. A controlled drawing or evaluation will identify the credited LIQUID IMPEDIMENTs, and where and how they are implemented.
SR 4.2.1.3	This SR requires monthly inspection to VERIFY that the established LIQUID IMPEDIMENT's containment/diversion configuration remains capable of supporting the reduced Minimum Thermal Separation Distance. The monthly FREQUENCY is adequate to ENSURE that the Minimum Thermal Separation Distances will continue to be met when LIQUID IMPEDIMENTs are credited for this LCO.

REFERENCES	<ol style="list-style-type: none">1. <i>Calculation for Radiant Energy at a Distance Away from Object for "Ordinary" Combustibles and Pool Fires</i>, SB-DO: CALC-11-014, R1, August 20112. <i>Accident Analysis Fuel Flow Rate Determination</i>, CALC-11-TA-54-AREAG-009, Rev 0, June 2011
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APPENDIX A BASES

A3.2 FIRE PROTECTION CONTROLS

A3.2.2 Control of TRANSIENT COMBUSTIBLES – FUEL PACKAGE Limit

BACKGROUND SUMMARY The control of FUEL PACKAGES within applicable DEFINED AREAs and their associated Thermal Separation Distances is an element of TRANSIENT COMBUSTIBLE controls that prevents continuity of combustible material that could contribute to the spread of a fire.

APPLICABILITY TO SAFETY ANALYSIS The safety function of the control of TRANSIENT COMBUSTIBLES, including limits on FUEL PACKAGES, is to reduce the likelihood of a FUEL PACKAGE being involved in a fire, and reduce the consequences of a fire by limiting fire progression within a DEFINED AREA and the amount of MAR involved.

LCO This LCO requires that within applicable DEFINED AREAS and their associated Thermal Separation Distances, FUEL PACKAGES SHALL be controlled as follows:

1. FUEL PACKAGES SHALL be ATTENDED.

OR

- 2a. Each FUEL PACKAGE SHALL be ≤ 100 lb of TRANSIENT COMBUSTIBLE material.

AND

- 2b. FUEL PACKAGES SHALL be ≥ 9 ft away from non-metal waste containers and other FUEL PACKAGES.

AND

- 2c. FUEL PACKAGES SHALL be ≥ 3 ft away from METAL CONTAINERS.

It is noted that this LCO does not apply to FUEL PACKAGES in transit or to combustible/flammable liquids. Stored non-metal waste containers such as FRPs, radiological barrier devices, and boundary markers (e.g., rope, plastic stanchions, signs) are not counted as TRANSIENT COMBUSTIBLE FUEL PACKAGES.

FUEL PACKAGES that are ATTENDED present a very low fire risk due to the capability of personnel to identify fire initiators and incipient fires and to elicit an appropriate response. The requirement to ATTEND reduces the likelihood of a FUEL PACKAGE being involved in a fire, and also serves to mitigate the potential effects if a fire should occur.

Accumulations of TRANSIENT COMBUSTIBLE materials up to 20 lb in a location are not considered to constitute a FUEL PACKAGE due to their minimal weight. Fires involving these de minimus quantities of materials are not likely to spread and would include minimal involvement of waste containers.

APPENDIX A BASES

A3.2 FIRE PROTECTION CONTROLS

A3.2.2 Control of TRANSIENT COMBUSTIBLES – FUEL PACKAGE Limit

The weight of FUEL PACKAGES located inside metal containers with a closed lid (e.g., closed metal cabinets, boxes, or drums) may be factored at 20% of the actual weight of TRANSIENT COMBUSTIBLE materials comprising the FUEL PACKAGE for the purposes of demonstrating compliance with LCO 2a. For example, a FUEL PACKAGE consisting of 200 lb of TRANSIENT COMBUSTIBLE materials located within a closed metal box may be treated as a 40 pound FUEL PACKAGE for the purpose of compliance with LCO 2a. This treatment is consistent with recommendations from the Society of Fire Protection Engineers for combustible materials inside closed non-fire rated metal enclosures.

The combustible load size of a FUEL PACKAGE ≤ 100 lb limits the radiant energy thermal output of the fire, at a distance of 9 ft, to below 10 kW/m^2 , which is sufficient to prevent ignition of an exposed combustible package. Similarly, the radiant energy thermal output of the same size fire at 3 ft is below 45 kW/m^2 , which is sufficient to prevent failure of a METAL CONTAINER (Ref. 1)

APPLICABILITY

This LCO requirement is applicable in OPERATION and WARM STANDBY. This LCO is applicable in these MODES since MAR can be present in DEFINED AREAS.

This LCO applies to applicable DEFINED AREAS and their associated Thermal Separation Distances in order to prevent fire spread. It does not apply to TRANSIENT COMBUSTIBLE materials in transit, since these materials are ATTENDED while in transit and present very little fire risk.

The control applies to FUEL PACKAGES that are introduced into, or located within, an applicable DEFINED AREA and its associated Thermal Separation Distance. Combustible materials that constitute part of a radioactive waste package or introduced to remediate waste packages in-situ are considered to be part of the TRU WASTE package once affixed to the waste package and not subject to this control. Temporary or permanent radiological barrier devices and boundary markers (e.g., rope, plastic stanchions, signs) are operationally necessary and are not counted as TRANSIENT COMBUSTIBLE FUEL PACKAGES.

This LCO is not applicable to LOW ACTIVITY AREAS. For postulated fire scenarios, the safety analysis does not credit the control of TRANSIENT COMBUSTIBLE FUEL PACKAGES to mitigate potential radiological releases involving up to 100 PE-Ci of MAR stored in LOW ACTIVITY AREAS. Hence, the safety analysis allows LOW ACTIVITY AREAS to be excluded from the Applicability of this LCO.

The LCO is specified for applicable DEFINED AREAS and their associated Thermal Separation Distances. Thermal Separation Distances associated with DEFINED AREAS are established in LCO 3.2.1.

APPENDIX A BASES

A3.2 FIRE PROTECTION CONTROLS

A3.2.2 Control of TRANSIENT COMBUSTIBLES – FUEL PACKAGE Limit

CONDITION A and associated ACTIONS and COMPLETION TIMES

CONDITION A is entered when the control of FUEL PACKAGES within an applicable DEFINED AREA or its associated Thermal Separation Distance is not compliant with LCO requirements. Under this CONDITION, the following ACTIONS constitute measures to restore compliance to the LCO requirement. Additional compensatory measures to account for the increase in risk associated with the FUEL PACKAGE control not being met are not warranted during the relatively brief period associated with the COMPLETION TIMES due to the very low fire risk during this period. A separate entry CONDITION is allowed for each applicable DEFINED AREA and its associated Thermal Separation Distance.

ACTION A.1.1 requires the FUEL PACKAGE to be ATTENDED within 2 hr. By ATTENDING the FUEL PACKAGE, compliance with the LCO is restored and the fire risk is minimized due to the capability of personnel to identify fire initiators and incipient fires and to elicit an appropriate response. Two hours is a reasonable time to ATTEND the FUEL PACKAGE, and takes into account the minimum amount of time required to assemble necessary resources to perform this ACTION.

ACTION A.1.2 requires the FUEL PACKAGE to be removed from the AFFECTED DEFINED AREA and its associated Thermal Separation Distance within 2 hr. This ACTION restores compliance with the LCO. Two hr is a reasonable time to remove the FUEL PACKAGE and takes into account the minimum amount of time required to assemble necessary resources and to perform this ACTION.

SURVEILLANCE REQUIREMENTS

- SR 4.2.2.1 This SR requires a weekly VERIFICATION that a FUEL PACKAGE contains ≤ 100 lb of TRANSIENT COMBUSTIBLE material, or is ATTENDED. The weekly FREQUENCY is appropriate based on operating experience associated with FUEL PACKAGE movements in DEFINED AREAs and the low fire risk during this short period of time between surveillances.
- SR 4.2.2.2 This SR requires a weekly VERIFICATION that that FUEL PACKAGES are ≥ 9 ft away from non-metal waste containers, or is ATTENDED. The weekly FREQUENCY is appropriate based on operating experience associated with FUEL PACKAGE movements in DEFINED AREAs and the low fire risk during this short period of time between surveillances.
- SR 4.2.2.3 This SR requires a weekly VERIFICATION that FUEL PACKAGES are ≥ 3 ft away from METAL CONTAINERS, or are ATTENDED. The weekly FREQUENCY is appropriate based on operating experience associated with FUEL PACKAGE movements in DEFINED AREAs and the low fire risk during this short period of time between surveillances.

APPENDIX A BASES

A3.2 FIRE PROTECTION CONTROLS

A3.2.2 Control of TRANSIENT COMBUSTIBLES – FUEL PACKAGE Limit

SR 4.2.2.4	This SR requires a shiftily VERIFICATION that FUEL PACKAGES are ATTENDED if the FUEL PACKAGES do not meet the mass and distance requirements specified in LCO Statements 2a, 2b, and 2c.
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REFERENCES	1. <i>Calculation for Radiant Energy at a Distance Away from Object for “Ordinary” Combustibles and Pool Fires</i> , SB-DO: CALC-11-014, R1, August 2011.
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APPENDIX A BASES

A3.2 FIRE PROTECTION CONTROLS

A3.2.3 Control of Liquid Run-On

BACKGROUND SUMMARY	The accident analysis involving a fuel pool fire credits a thermal separation distance from the edge of a fuel pool fire to a DEFINED AREA. The fuel pool fire analysis assumes the liquid pool forms and spreads on a smooth, flat surface. In the case of Pit 9 and Trenches A-D during retrieval activities, a berm, curb, slope, ditch and/or equivalent liquid flow impediment is used to limit the spread of a fuel pool fire from liquid fueled retrieval equipment because the flow of the fuel is either stopped and/or is directed in such a way so to not impact waste within the DEFINED AREA.
APPLICABILITY TO SAFETY ANALYSIS	The fuel pool fire accident analysis credits a thermal separation distance from the edge of a fuel pool fire to a DEFINED AREA with limiting the radiant heat flux to which neighboring waste containers could be exposed. No thermal separation distance is required from the impediment to the retrieval area because the radiant heat flux diminishes with horizontal distance and with height above the burning fuel, and is negligible at elevations lower than that of the burning fuel pool. Due to the ability of liquid fuels to flow from the immediate area of a spill into the lower elevation of a RETRIEVAL AREA Pit or Trench, and thus affect thermal separation distances, this control is established to control liquid fuel run-on and restrict the potential fuel source from reaching the waste containers in Pit 9 or Trenches A-D.
LCO	<p>This LCO requires the following:</p> <p>LIQUID IMPEDIMENTs SHALL be established between liquid fueled retrieval equipment and the edge of Pit 9/Trenches A-D.</p> <p>LIQUID IMPEDIMENTs are established between the liquid fueled retrieval equipment and the edge of Pit 9/Trenches A-D in order to prevent fuel spills from the liquid fueled retrieval equipment from entering the pit or trench. These impediments are sized to contain or divert the maximum fuel capacity of the retrieval equipment so that spilled fuel will not flow into the pit or trench. By keeping any spilled fuel diverted or contained above grade, the LIQUID IMPEDIMENTs prevent the radiant heat flux from a potential fuel pool fire from impacting waste containers at a lower elevation within the pit or trench.</p>
APPLICABILITY	<p>This LCO requirement is applicable in OPERATION and WARM STANDBY. This LCO is applicable in these MODES since MAR can be present in DEFINED AREAS.</p> <p>This LCO is applicable to Pit 9 and Trenches A-D RETRIEVAL AREAS when liquid fueled retrieval equipment is present at Pit 9/Trenches A-D.</p> <p>This LCO is not applicable during the time during reconfigurations needed to accommodate relocation of the retrieval equipment.</p>

APPENDIX A BASES

A3.2 FIRE PROTECTION CONTROLS

A3.2.3 Control of Liquid Run-On

CONDITION A and
associated
ACTIONS and
COMPLETION
TIMES

CONDITION A is entered when LIQUID IMPEDIMENTs are not established between the liquid fueled retrieval equipment and the edge of Pit 9/Trench A-D when liquid fueled retrieval equipment is present at Pit 9/Trench A-D. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the non-compliant LIQUID IMPEDIMENT. A separate entry CONDITION is allowed for each AFFECTED Pit 9 and Trench A-D.

ACTION A.1 requires the ATTENDANCE of the retrieval equipment located at the AFFECTED Pit 9/Trench A-D IMMEDIATELY. ATTENDANCE of the equipment compensates for the out-of-specification CONDITION by providing for the ongoing inspection of the AFFECTED areas for circumstances that could cause or contribute to fuel leaks and to provide notification if a leak occurred. The IMMEDIATE COMPLETION TIME represents the most conservative COMPLETION TIME available to the operator.

Relocation of the retrieval equipment is not generally appropriate under this CONDITION due to the unique configuration of the retrieval crane location and greater possibility for a fuel spill if the crane is moved to a different location than if the crane remains undisturbed. In this situation, the ATTENDANCE of the equipment provides a better means to mitigate the risk than its relocation.

ACTION A.2 requires placing the AFFECTED Pit 9/Trench A-D in WARM STANDBY within 2 hr. This ACTION places the AFFECTED areas into a SAFE CONFIGURATION, which minimizes fire initiators and stops NON-ESSENTIAL ACTIVITIES. This ACTION reduces the fire initiation risk to a very low level as rapidly as possible. The 2 hr COMPLETION TIME is very short compared to the frequency of postulated accidents, yet it is sufficient time to safely make the MODE transition.

ACTION A.3.1 requires the establishment of a LIQUID IMPEDIMENT between the liquid fueled retrieval equipment and the edge of the affected pit or trench within 24 hours. The COMPLETION TIME of 24 hours is as prompt as reasonably achievable to obtain materials and establish a curb, berm, or other impediment with the capacity to contain or divert the liquid fuel in the event of a spill from the retrieval equipment.

ACTION A.3.2 requires the removal of the liquid fuel source (i.e., the liquid fueled retrieval equipment) from the RETRIEVAL AREA. Removing the liquid fueled equipment to a location at or beyond that specified in LCO 3.6 for refueling activities is sufficient to ensure any leaked fuel would not enter the RETRIEVAL AREA Pit or Trench. The COMPLETION TIME of 24 hours is a reasonable amount of time

APPENDIX A BASES

A3.2 FIRE PROTECTION CONTROLS

A3.2.3 Control of Liquid Run-On

SURVEILLANCE REQUIREMENTS

SR 4.2.3.1

to safely accomplish the relocation of the liquid fueled retrieval equipment.

This SR requires VERIFICATION that a LIQUID IMPEDIMENT is capable of containing or diverting the full liquid fuel capacity of the retrieval equipment stationed at the RETRIEVAL AREA, prior to the start of retrieval activities and after relocation of liquid fueled retrieval equipment at an active RETRIEVAL AREA.

The SR ensures the configuration of the LIQUID IMPEDIMENT can contain or divert the full liquid fuel capacity of the retrieval equipment stationed at the RETRIEVAL AREA, leaking at an average rate of 25 gpm. A controlled drawing or evaluation will identify the credited LIQUID IMPEDIMENTs, and where and how they are implemented. The inspection criteria for LIQUID IMPEDIMENTs are established in facility procedures, considering the physical and environmental conditions existing at each impediment location. These inspection criteria include criteria to VERIFY that functional requirements can be met in case of environmental impacts to the LIQUID IMPEDIMENTs (e.g., snow build-up, pile-up of tumbleweeds, gopher holes).

The FREQUENCY is appropriate to VERIFY that functional requirements for the established LIQUID IMPEDIMENTs are met before the first below-ground waste containers are uncovered in a new RETRIEVAL AREA, and after the periodic relocation of retrieval equipment to reach additional waste containers within an active retrieval pit or trench.

SR 4.2.3.2

This SR requires monthly inspection to VERIFY that the established LIQUID IMPEDIMENT's containment/diversion configuration remains capable of containing or diverting the full liquid fuel capacity of the retrieval equipment stationed at the RETRIEVAL AREA. The monthly FREQUENCY is adequate to ENSURE that the Liquid Run-On control will continue to be met.

REFERENCES

1. *Calculation for Radiant Energy at a Distance Away from Object for "Ordinary" Combustibles and Pool Fires*, SB-DO: CALC-11-014, R1, August 2011.
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APPENDIX A BASES

A3.3 COMBUSTIBLE/FLAMMABLE LIQUID CONTROLS

A3.3.1 Combustible/Flammable Liquid Controls in DEFINED AREAS and Associated Thermal Separation Distance

BACKGROUND SUMMARY	<p>Most TRU WASTE container activities within DEFINED AREAS are performed using electric or propane powered equipment because electric forklifts are inefficient and do not function well over the rough terrain of the Area G environs. Fuel pool fires are not possible when using this type of equipment. However, NORMAL OPERATIONS (e.g., maintenance, painting, decontamination) within DEFINED AREAS require the use of small quantities of combustible/flammable liquids. Infrequently, liquid fueled vehicles and/or equipment (e.g., diesel forklifts, manlifts) are required to handle large heavy containers that are located in DEFINED AREAS and perform certain maintenance activities (e.g., dome maintenance). Therefore, it is necessary that liquid fueled vehicles be permitted into DEFINED AREAS which increases the likelihood of fuel pool fires during these infrequent and limited duration activities.</p>
APPLICABILITY TO SAFETY ANALYSIS	<p>This control is credited for pool fire events. The footprint of a fuel pool determines the potential amount of radiological material affected. The maximum amount of radiological material that can be involved in the fire can be calculated by determining the pool size and the maximum height of stored waste. By limiting the amount of liquid fuel, the amount of MAR affected is limited. Fuel pool fires of less than or equal to 7 gal were determined to have minimal risk due to their short burn duration and limited MAR involvement. The requirement for a trained attendant reduces the likelihood of initiating or propagating a fire involving flammable/combustible liquids, by identifying fire initiators and incipient fires and eliciting an appropriate response.</p> <p>The presence of liquid-fueled vehicles/equipment does not, in and of itself, result in a fire. In order for such an event to occur, an accident resulting in the puncturing of the fuel tank or hydraulic reservoir in coincidence with an ignition source would be required. Controlling liquid-fueled vehicles/equipment in the applicable area reduces the likelihood for fuel-pool fires in these areas. Limiting the quantity of combustible/flammable liquids performs a mitigative safety function of limiting the maximum postulated size of a pool fire and therefore, the amount of MAR involved in the fire.</p>
LCO	<p>The LCO for combustible/flammable liquid controls requires the following be met in an individual DEFINED AREA and their associated thermal separation distances:</p> <ol style="list-style-type: none">1a. For DEFINED AREAS containing only METAL CONTAINERS: Volumes greater than 7 gal SHALL be ATTENDED. <p style="text-align: center;"><u>OR</u></p> <ol style="list-style-type: none">1b. For DEFINED AREAS containing non-metal containers: All Combustible/flammable liquids SHALL be ATTENDED. <p style="text-align: center;"><u>AND</u></p> <ol style="list-style-type: none">2. The total volume SHALL be \leq 100 gal.

APPENDIX A BASES

A3.3 COMBUSTIBLE/FLAMMABLE LIQUID CONTROLS

A3.3.1 Combustible/Flammable Liquid Controls in DEFINED AREAS and Associated Thermal Separation Distance

The inclusion of the thermal separation distance around each DEFINED AREA ensures that a process upset external to the DEFINED AREA does not adversely affect MAR in the DEFINED AREA. Thermal separation requires a minimum separation distance to ensure that the heat flux from an external fire does not generate sufficient heating of material in the applicable area to cause spontaneous combustion. The thermal separation distances are described in LCO 3.2.1

A fuel pool fire involving less than or equal to 7 gal was determined to have minimal risk on METAL CONTAINERS, and therefore, exceeding this limit requires additional effort to reduce the likelihood or mitigate the consequences of a fuel spill and subsequent fire. The ATTENDANCE of the additional fuel source(s) ENSURES that an individual is responsible for monitoring the fuel source for leakage and responding to spills. This ensures prompt response and minimizes the time at risk. One individual can perform the ATTEND function provided they can maintain visual contact with the item requiring control.

The requirement to ATTEND all combustible/flammable liquids in the non-metal container DEFINED AREA serves a mitigative safety function of limiting the maximum postulated size of a pool fire and therefore, the amount of MAR involved in the fire. All combustible/flammable liquids must be ATTENDED because of the much lower heat flux required to cause failure of a non-metal container versus that of a METAL CONTAINER (~10 kw/m² to cause ignition of the non-metal containers and their contents versus ~45 kw/m² to cause drum lid failure for METAL CONTAINERS).

The DEFINED AREA SHALL be limited to ≤ 100 gal of combustible/flammable liquids.

APPLICABILITY

This LCO requirement is applicable during the OPERATION and WARM STANDBY MODES since MAR may be present in these MODES.

The area of Applicability is all DEFINED AREAS and their applicable thermal separation distances. The applicable thermal separation distances are specified in LCO 3.2.1.

The following are excluded from the requirements of this LCO:

- *Propane fueled forklifts:* Propane is considered to present a small risk of resulting in a pool fire. This is due to the characteristics of propane; as the liquid propane leaks, it does not pool because it converts into a gaseous state.
- *TRU WASTE and LLW/MLLW container contents:* TRU WASTE and LLW/MLLW containers may contain limited quantities of combustible/flammable liquids. Experience has shown that while TRU WASTE containers have been found to contain liquids, the liquids are primarily water (e.g., rain water, condensation) with discovery of combustible/flammable liquids being found in a small percentage of

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A3.3 COMBUSTIBLE/FLAMMABLE LIQUID CONTROLS

A3.3.1 Combustible/Flammable Liquid Controls in DEFINED AREAS and Associated Thermal Separation Distance

containers. Even when discovered, the quantities are small. Since these quantities are small and widely distributed throughout the container inventory, a common cause event leading to the formation of a fuel pool containing > 7 gal of liquid fuels and the ignition of the fuel pool is considered to be beyond extremely unlikely.

- *The liquids contained in equipment used for the NDA/NDE activities:* The liquids (e.g., hydraulic fluids) contained in equipment used for the NDA/NDE activity are also exempted. The NDA/NDE equipment is needed to perform waste characterization and verification and is not considered a great risk because a considerable amount of preheating of these types of fluids would be needed for them to ignite.
- *Combustible liquids with an flammability rating of 0 and 1:* Finally, this LCO excludes combustible liquids (such as lubricants, adhesives, sealants, hydraulic fluids, compressor oils, cleansers) with a National Fire Protection Association (NFPA) 704 Flammability Rating of 1 or 0 or (if a Flammability Rating is not available for a particular liquid), any liquid with a flashpoint of 200 °F or higher. These liquids require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Such liquids will not start a fire and do not present the same fire hazard as flammable liquids with a lower flash point temperature.
- *The area surrounding liquid fueled retrieval equipment located at Pit 9 and Trenches A-D:* Liquid fueled retrieval equipment located at Pit 9 and Trenches A-D will employ LIQUID IMPEDIMENTs to prevent a fuel pool fire originating from the retrieval equipment from impacting waste that is below grade in the pit or trench. These LIQUID IMPEDIMENT controls are specified in LCO 3.2.3 and provide an equivalent control to this LCO, allowing the exclusion of these areas from the Applicability of this LCO.
- *LOW ACTIVITY AREAS:* This control is not applicable to LOW ACTIVITY AREAS since the safety analysis demonstrates that unmitigated radiological releases from LOW ACTIVITY AREAS together with the mitigated releases from all other DEFINED AREAS where the control is applied will not result in dose consequences that challenge the EG.

CONDITION A and associated ACTIONS and COMPLETION TIMES

CONDITION A is applicable to METAL CONTAINER DEFINED AREAS and their associated thermal separation distance. It is entered when the volume of combustible/flammable liquids present is > 7 gal and is not ATTENDED. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with liquid fueled vehicle/equipment. A separate entry CONDITION is allowed for each AFFECTED DEFINED AREA/thermal separation distance.

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A3.3 COMBUSTIBLE/FLAMMABLE LIQUID CONTROLS

A3.3.1 Combustible/Flammable Liquid Controls in DEFINED AREAS and Associated Thermal Separation Distance

ACTION A.1.1 requires that the volume of combustible/flammable liquids > 7 gal be ATTENDED IMMEDIATELY. This ACTION restores compliance with the LCO. The ACTION ENSURES that personnel are available to respond and take action to stop or minimize a postulated leak. The IMMEDIATE COMPLETION TIME represents the most conservative COMPLETION TIME available to the operator.

ACTION A.1.2 is an alternative to ACTION A.1.1 and requires that the volume of combustible/flammable liquids be reduced to ≤ 7 gal in the AFFECTED DEFINED AREA and its associated thermal separation distance within 2 hr. This ACTION restores compliance with the LCO. The COMPLETION TIME of 2 hr is very short compared to the analyzed unmitigated frequency of a fuel pool fire from a container leak (i.e., Unlikely bin = 10^{-2} to 10^{-4} /yr), yet is sufficient time to safely reduce the volume of combustible/flammable liquids within the AFFECTED DEFINED AREA and its associated thermal separation distance.

CONDITION B and associated ACTIONS and COMPLETION TIMES

CONDITION B is applicable to non-METAL container DEFINED AREAS and their associated thermal separation distances and is entered when any combustible/flammable liquids are present and not ATTENDED. Under this CONDITION, the following ACTION constitutes compensatory measures to account for the increase in risk associated with liquid fueled vehicle/equipment. A separate entry CONDITION is allowed for each AFFECTED DEFINED AREA/thermal separation distance.

ACTION B.1 requires that the combustible/flammable liquids be ATTENDED IMMEDIATELY. This ACTION restores compliance with the LCO. The ACTION ENSURES that personnel are available to respond and take action to stop or minimize a postulated leak. The IMMEDIATE COMPLETION TIME represents the most conservative COMPLETION TIME available to the operator.

CONDITION C and associated ACTIONS and COMPLETION TIMES

CONDITION C is entered when > 100 gal of combustible/flammable liquid fuel volume is present in a DEFINED AREA and associated thermal separation distance. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with combustible/flammable liquid volume limits being. A separate entry CONDITION is allowed for each AFFECTED DEFINED AREA/thermal separation distance.

ACTION C.1 requires the volume of combustible/flammable liquids greater than 100 gal to be ATTENDED IMMEDIATELY. The ACTION provides a compensatory measure to ENSURE that personnel are available to respond and take action to stop or minimize a postulated leak. The IMMEDIATE COMPLETION TIME represents the most conservative COMPLETION TIME available to the operator.

APPENDIX A BASES

A3.3 COMBUSTIBLE/FLAMMABLE LIQUID CONTROLS

A3.3.1 Combustible/Flammable Liquid Controls in DEFINED AREAS and Associated Thermal Separation Distance

ACTION C.2 requires placing the AFFECTED DEFINED AREA in WARM STANDBY within 2 hr. This ACTION places the AFFECTED DEFINED AREAs into a SAFE CONFIGURATION, which minimizes fire initiators and stops NON-ESSENTIAL ACTIVITIES. This ACTION reduces the fire risk to a very low level as rapidly as possible. The 2 hr COMPLETION TIME is very short compared to the frequency of postulated accidents, yet it is sufficient time to safely make the MODE transition.

ACTION C.3 requires that the total volume of combustible/flammable liquids be reduced to ≤ 100 gal within 24 hr. This ACTION restores compliance with the LCO and averts an increase in the magnitude of potential radiological material releases involving a > 100 gal volume compared to the analyzed unmitigated frequency of a fuel pool fire from a container leak. The COMPLETION TIME of 24 hr is short compared to the analyzed unmitigated frequency of a fuel pool fire from a container leak (i.e., Unlikely bin = 10^{-2} to 10^{-4} /yr), yet allows time to coordinate activities and obtain equipment necessary to remove excess liquids (e.g., in the event of a non-functioning liquid fueled vehicle).

SURVEILLANCE REQUIREMENTS

- SR 4.3.1.1 This SR VERIFIES that an individual is ATTENDING combustible/flammable liquid volumes greater than 7 gal in each DEFINED AREA and associated thermal separation distance containing only METAL CONTAINERS. This VERIFIES the requirements of LCO statement #1a are met. The FREQUENCY of prior to introducing combustible/flammable liquid into the applicable area ensures that the combustible/flammable liquid will be ATTENDED. Since the SR is performed before the combustible/flammable liquid is brought into an applicable area then if an individual is not available to ATTEND the combustible/flammable liquid then the liquid is not introduced into an applicable.
- SR 4.3.1.2 This SR VERIFIES that all combustible/flammable liquids in each DEFINED AREA and associated thermal separation distance containing non-metal containers are ATTENDED. This VERIFIES the requirements of LCO statement #1b are met. The FREQUENCY of prior to introducing combustible/flammable liquid into the applicable area ensures that the combustible/flammable liquid will be ATTENDED. Since the SR is performed before the combustible/flammable liquid is brought into an applicable area then if an individual is not available to ATTEND the combustible/flammable liquid then the liquid is not introduced into an applicable area.
- SR 4.3.1.3 This SR VERIFIES that the total volume of combustible/flammable liquids in each DEFINED AREA and associated thermal separation distance is ≤ 100 gal. This VERIFIES the requirements of LCO statement #2 are met. The FREQUENCY of prior to introduction of combustible/flammable liquids in the applicable area ensures that the quantities of flammable/combustible liquids
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APPENDIX A BASES

A3.3 COMBUSTIBLE/FLAMMABLE LIQUID CONTROLS

A3.3.1 Combustible/Flammable Liquid Controls in DEFINED AREAS and Associated Thermal Separation Distance

assumed in the analysis is not exceeded. Since the SR is performed before the combustible/flammable liquid (e.g., liquid fueled vehicle/equipment) is brought into an applicable area then if the quantity is > 100 gal then the liquid is not introduced into an applicable area.

REFERENCES None

APPENDIX A BASES

A3.4 TRU WASTE CONTAINER MANAGEMENT

A3.4.1 Above-Ground UNVENTED TRU WASTE DRUMS

BACKGROUND SUMMARY

This LCO requires that above-ground UNVENTED TRU WASTE DRUMS be in an ISOLATION AREA and not stacked. Closed metal TRU WASTE drums permit the buildup of combustible gases. Physical interactions with such containers can result in the ignition of the combustible gas resulting in a deflagration with the potential for lid ejection.

Various non-drum TRU WASTE containers by design and/or construction (e.g., SeaLand containers, transportainers, metal-encased wood boxes, FRPs, plastic-wrapped waste, and CMPs) are passively vented (i.e., do not permit buildup of volatile/flammable gases) and do not require the installation of physical vents. The containers are not leak tight and therefore any gas generated within the container would diffuse over time.

Other non-drum TRU WASTE containers by their robust design and/or construction are designed to withstand an explosion and do not require the installation of physical vents (e.g., metal boxes, Bolas Grande spheres). Per DOE-STD-5506-2007, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities*, which cites results of Idaho Drum Deflagration Tests, containers of sound integrity that are overpacked, SWBs, direct loaded RH canisters with welded lids, and RH canister with nested metal drums can be credited to prevent lid loss and ejection of material during a deflagration. The DOE-STD-5506-2007 cites the following: “For SWB, RH canister with nested metal drums, and the overpacked drum, a significant release from the potential venting through the outer container seal is not expected.”

Drum deflagration tests cited in DOE-STD-5506 indicated that sympathetic deflagration of a drum on top of a deflagrating drum has occurred. Therefore, it has been postulated that stacked UNVENTED TRU WASTE DRUMS could result in sympathetic deflagrations. That is, a deflagration in the lower container causes the upper container to deflagrate. Not permitting UNVENTED TRU WASTE DRUMS to be stacked prevents sympathetic deflagrations from occurring and prevents an UNVENTED TRU WASTE DRUM from toppling from an upper tier.

The majority of TRU WASTE drums that are readily accessible (i.e., above-ground) are vented. UNVENTED TRU WASTE DRUMS are in an ISOLATION AREA and not stacked. It is anticipated that unvented drums will be discovered during TA-54, Area G activities. The determination of TRU WASTE drums vent status requires observation of the container. When discovered, this control requires that an UNVENTED TRU WASTE DRUM is OVERPACKED or placed into an ISOLATION AREA and not stacked.

APPLICATION TO SAFETY ANALYSIS

The accident analysis conservatively assumes that an UNVENTED TRU WASTE DRUM with a buildup of combustible gases can deflagrate if mechanically insulted or toppled from a stack. A passively VENTED TRU WASTE DRUM reduces the likelihood for the buildup of combustible

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A3.4 TRU WASTE CONTAINER MANAGEMENT

A3.4.1 Above-Ground UNVENTED TRU WASTE DRUMS

gases, which could deflagrate during activities involving UNVENTED TRU WASTE DRUMS.

The isolation of UNVENTED TRU WASTE DRUMS within an ISOLATION AREA reduces the likelihood for an UNVENTED TRU WASTE DRUM to be inadvertently impacted by nearby work activities (e.g., forklift operations). Prohibiting the stacking of UNVENTED TRU WASTE DRUMS prevents sympathetic deflagrations and reduces the likelihood for an UNVENTED TRU WASTE DRUM to be toppled and involved in applicable accident scenarios.

LCO UNVENTED TRU WASTE DRUMS that are above-ground SHALL be:

1. Located in an access restricted ISOLATION AREA

AND

2. Not stacked

For the purposes of this LCO, TRU WASTE drums known or suspected to be under-vented or improperly vented are treated as UNVENTED TRU WASTE DRUMS.

APPLICABILITY

This LCO requirement is applicable in OPERATION and WARM STANDBY. This LCO is applicable in these MODES since MAR can be present in DEFINED AREAS.

This LCO is applicable to above-ground DEFINED AREAS, excluding RETRIEVAL AREAS and Drum Venting process areas. RETRIEVAL AREAS in Pit 9 and Trenches A through D do not require Applicability of this LCO since a separate SAC exists to control the hazards associated with drums during their retrieval. This LCO is also not applicable to Drum Venting process areas since other controls are established in accordance with LCO 3.4.2 for UNVENTED TRU WASTE DRUMS in these areas.

Non-drum TRU WASTE containers are capable of preventing the release of radiological material and, therefore the buildup of contained volatile/flammable gases is not of concern. Therefore, these non-drum TRU WASTE containers are not subject to this LCO.

CONDITION A and associated ACTIONS and COMPLETION TIMES

CONDITION A is entered when an above-ground UNVENTED TRU WASTE DRUM is discovered to not be located in an access restricted ISOLATION AREA. Under this CONDITION, the following ACTIONS constitute compensatory measures to account for the increase in risk associated with the discovered UNVENTED TRU WASTE DRUM.

ACTION A.1 requires NON-ESSENTIAL ACTIVITIES within 15 ft of the AFFECTED UNVENTED TRU WASTE DRUM to be stopped IMMEDIATELY. Stopping NON-ESSENTIAL ACTIVITIES will minimize activities that may impact the UNVENTED TRU WASTE DRUM causing it

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A3.4 TRU WASTE CONTAINER MANAGEMENT

A3.4.1 Above-Ground UNVENTED TRU WASTE DRUMS

to fall or deflagrate. A 15-ft isolation distance is established consistent with the definition of an ISOLATION AREA to minimize the probability that any drum moving or handling operations could inadvertently impact the AFFECTED UNVENTED TRU WASTE DRUM causing its deflagration. This distance is derived from the consideration of an accident involving a drop/tip over of a 3rd-tier pallet of drums and forklift into the exclusion area. If the forklift tines are at the height required to remove a 3rd-tier pallet, and the 3rd-tier pallet and forklift fall over, the pallet will fall a maximum of approximately 11 ft within the exclusion zone. In this improbable bounding drop/tip over accident, a 4-ft distance is still maintained between the dropped pallet and the AFFECTED drum.

The COMPLETION TIME of IMMEDIATELY ensures activities are stopped as soon as possible that may impact the UNVENTED TRU WASTE DRUM, cause violent shaking, or create an ignition source that may lead to a deflagration. Performing this ACTION IMMEDIATELY represents the most conservative COMPLETION TIME available to the operator to prevent a condition that could lead to sympathetic deflagration

ACTION A.2.1 requires that the UNVENTED TRU WASTE DRUM be placed within an access restricted ISOLATION AREA within 48 hr. The ISOLATION AREA is an operation-free location and where non-essential personnel and NORMAL OPERATIONS are prohibited. Placing the UNVENTED TRU WASTE DRUM within an access restricted ISOLATION AREA restores compliance with the LCO.

The COMPLETION TIME of 48 hr to place the UNVENTED TRU WASTE DRUM in the access restricted ISOLATION AREA allows sufficient time to coordinate the equipment and personnel to accomplish the placement activity and establish the ISOLATION AREA, while completing the ACTION in a timely manner. The COMPLETION TIME is also based on the low likelihood that an UNVENTED TRU WASTE DRUM at rest would deflagrate. For the deflagration to occur it would need to have a combustible gas and be acted upon to cause the ignition of the gas.

ACTION A.2.2 is an alternative to ACTION A.2.1 and requires placing the UNVENTED TRU WASTE DRUM in an OVERPACK within 48 hr. Placing the UNVENTED TRU WASTE DRUM into an OVERPACK provides additional protection and restores compliance with the LCO.

The COMPLETION TIME of 48 hr to place the UNVENTED TRU WASTE DRUM in an OVERPACK allows sufficient time to coordinate the equipment and personnel to accomplish the placement activity while completing the ACTION in a timely manner. The COMPLETION TIME is also based on the low likelihood that an UNVENTED TRU WASTE DRUM at rest would deflagrate. For the deflagration to occur it would need to have a combustible gas and be acted upon to cause the ignition of the gas.

APPENDIX A BASES

A3.4 TRU WASTE CONTAINER MANAGEMENT

A3.4.1 Above-Ground UNVENTED TRU WASTE DRUMS

CONDITION B and associated ACTIONS and COMPLETION TIMES	CONDITION B is entered when an above-ground UNVENTED TRU WASTE DRUM is discovered to be stacked. Under this CONDITION, the following ACTION is established to mitigate the risk associated with the stacked UNVENTED TRU WASTE DRUM and restore compliance with the LCO.
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ACTION B.1 requires that if the UNVENTED TRU WASTE DRUM is stacked that it be unstacked within 24 hr. Completion of this ACTION restores compliance with the LCO.

The COMPLETION TIME of 24 hr allows time to coordinate the equipment and personnel to accomplish the unstacking activity while completing the ACTION in a timely manner. The COMPLETION TIME is also based on the low likelihood that an UNVENTED TRU WASTE DRUM at rest would deflagrate. For the deflagration to occur it would need to have a combustible gas and be acted upon to cause the ignition of the gas.

SURVEILLANCE REQUIREMENTS

SR 4.4.1.1

This SR VERIFIES that UNVENTED TRU WASTE DRUMs that are above ground are located in an access-restricted ISOLATION AREA and that the ISOLATION AREA includes a 15-ft exclusion area. This surveillance may be performed by querying applicable drum inventory database(s) to determine the locations of above-ground UNVENTED TRU WASTE DRUMs and VERIFYING the drum locations shown on the database(s) correspond to access restricted ISOLATION AREAs. The weekly FREQUENCY is appropriate given the low likelihood that an UNVENTED TRU WASTE DRUM would deflagrate during this short period between surveillances.

SR 4.4.1.2

This SR VERIFIES that UNVENTED TRU WASTE DRUMs in the ISOLATION AREA are not stacked. The SR is performed weekly when UNVENTED TRU WASTE DRUMs are present in the ISOLATION AREA, and when additional UNVENTED TRU WASTE DRUMs are moved into an ISOLATION AREA. The weekly FREQUENCY is sufficient because when UNVENTED TRU WASTE DRUMs are stored in an ISOLATION AREA, NORMAL OPERATIONS are not allowed, resulting in a very low likelihood that UNVENTED TRU WASTE DRUMs could be inadvertently stacked in the interim period between surveillances.

REFERENCES

None

APPENDIX A BASES

A3.4 TRU WASTE CONTAINER MANAGEMENT

A3.4.2 UNVENTED TRU WASTE DRUM HANDLING and TRANSPORT

BACKGROUND SUMMARY

Drums that do not contain vents may be of concern because they are in a sealed condition. For TRU WASTE in these containers, the generation of hydrogen from the radiological decomposition of combustible waste could be significant enough that a flammable gas mixture within the headspace of the drum may be created. If the UNVENTED TRU WASTE DRUM is impacted with sufficient force, and a spark is produced, a drum deflagration may occur.

Unvented containers at rest are unlikely to deflagrate. However, it is postulated that an UNVENTED TRU WASTE DRUM could deflagrate during certain activities. A deflagration could result in lid ejection and the ejection of some portion of container contents.

This LCO provides a mechanism to manage UNVENTED TRU WASTE DRUMS to mitigate the deflagration hazard. Controls included in the LCO in case of a deflagration include: 1) the use of a drum lid restraint to prevent the energetic transport of the drum lid and to ensure that any burning of the drum contents will be confined, and 2) the use of a blast shield/engineered or 3) a safe standoff distance, which protects workers from the blast wave and limits exposure to radiological material released during the deflagration.

APPLICATION TO SAFETY ANALYSIS

The drums that do not contain vents may be of concern because they are in a sealed condition. For TRU WASTE in these containers, the generation of hydrogen from the radiological decomposition of combustible waste could be significant enough that a flammable gas mixture within the headspace of the drum may be created. If the UNVENTED TRU WASTE DRUM is impacted with sufficient force, and a spark is produced, a drum deflagration may occur.

During HANDLING and TRANSPORT of UNVENTED TRU WASTE DRUM, there is a potential to drop, impact, or cause significant shaking thereby increasing the likelihood of a deflagration. This control ensures that the workers performing the movement are protected from physical injury from an ejected lid or blast overpressure, and that the release of radiological material is limited.

The mitigative safety functions of this control are as follows:

- Reduces adverse physical consequences to workers by limiting physical injury and radiological dose.
- Reduces adverse radiological consequences by assuring confined burning.

This LCO implements the worker protection controls, consistent with worker protection controls for deflagration accidents that are cited in the DOE-STD-5506.

LCO

During HANDLING (other than MINOR MOVEMENT) of UNVENTED TRU WASTE DRUMS, a lid restraining device SHALL be installed.

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A3.4 TRU WASTE CONTAINER MANAGEMENT

A3.4.2 UNVENTED TRU WASTE DRUM HANDLING and TRANSPORT

UNVENTED TRU WASTE DRUMS being TRANSPORTED SHALL meet the following:

1. Have a lid restraining device installed.

AND

- 2a. Have a shielding/engineered barrier between the UNVENTED TRU WASTE DRUM and the worker.

OR

- 2b. Maintain a safe standoff distance ≥ 30 ft between the UNVENTED TRU WASTE DRUM and the worker.

This LCO is not applicable during MINOR MOVEMENTS of UNVENTED TRU WASTE DRUMS. The movement necessary to allow the attachment or removal of a lid restraint or insertion into a blast mitigation device (e.g., DVS chamber, for venting) is unlikely to cause an impact that could lead to a deflagration.

Lid restraints provide a means to restrain a drum lid in the event of a deflagration during HANDLING or TRANSPORT of an UNVENTED TRU WASTE DRUM. The restraint is not required to keep the lid from lifting during all anticipated deflagrations, but is relied upon to prevent the energetic transport of the lid beyond the deflagration site. When inserting or removing an UNVENTED TRU WASTE DRUM from a nested configuration, the lifting device is required to perform the safety function of a lid restraint. When the UNVENTED TRU WASTE DRUM is not being HANDLED or TRANSPORTED, the lid restraining device is not required. The removal of the lid restraining device is allowed because its removal from the UNVENTED TRU WASTE DRUM does not result in significant perturbation to or movement of the UNVENTED TRU WASTE DRUM.

In addition to the lid restraint, the use of shielding/engineered barriers or a safe standoff distance is required for the protection of workers when TRANSPORTING an UNVENTED TRU WASTE DRUM. TRANSPORT may require lifting with a forklift or travel over rough roadways or uneven surfaces that increase the likelihood for significant shaking or impact to the TRANSPORTED drum. Only the lid restraint is required when HANDLING an UNVENTED TRU WASTE DRUM (e.g., using a drum hauler or casters to move a drum from an ISOLATION AREA to the drum venting area within the same building, dome, or pad), because an impact sufficient to cause a deflagration is extremely unlikely during HANDLING.

Shielding/engineered barriers provide a means to protect personnel from the deflagration pressure surge and to limit radiological exposure. Forklifts with enclosed cabs meet this requirement due to the large area presented by metal components (e.g., forklift mast) located between the drum and the forklift operator, as well as the cab construction.

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A3.4 TRU WASTE CONTAINER MANAGEMENT

A3.4.2 UNVENTED TRU WASTE DRUM HANDLING and TRANSPORT

Due to their widespread industrial use, the lid restraints and forklift enclosures or other types of shielding/barriers are procured, installed, and maintained in accordance with standard industrial practices applied to such devices. This LCO does not require specific performance or quality criteria for those devices.

A safe standoff distance provides a means to prevent serious physical injury to the worker from the blast wave, and to limit exposure to radiological material released by the deflagration. Additionally, this distance allows workers at or beyond the safe standoff distance time to react to the accident and evacuate before receiving a significant airborne radiological dose.

This LCO ENSURES that all receptors involved in the HANDLING (other than MINOR MOVEMENT) or TRANSPORT of the UNVENTED TRU WASTE DRUM are protected by an appropriate combination of the LCO requirements. For example, if an UNVENTED TRU WASTE DRUM is TRANSPORTED between DEFINED AREAS, a crane lift operator may be protected by LCO 3.4.2.2a, such as through the shielding/engineering barrier provided by the cab of the crane. However, any crane lift spotters may be protected by LCO 3.4.2.2a via another type of shielding/engineering barrier, or alternately may satisfy LCO 3.4.2.2b by being more than 30 ft away from the UNVENTED TRU WASTE DRUM that is lifted.

APPLICABILITY

This LCO is applicable during OPERATION when HANDLING or TRANSPORTING UNVENTED TRU WASTE DRUMs. UNVENTED TRU WASTE DRUMs in a vented OVERPACK are not subject to the requirements of this LCO due to the protection provided by the OVERPACK. Per DOE-STD-5506, the OVERPACK provides protection from the effects of a deflagration, such as lid loss and ejection of material.

This LCO is not applicable during MINOR MOVEMENTS. These activities are unlikely to result in a deflagration. Standard work safety practices are in place to minimize the potential for worker injury. Once the UNVENTED TRU WASTE DRUM is prepared for TRANSPORT, then the UNVENTED TRU WASTE DRUM must be moved with a lid restraint and blast shield/engineered barrier, or safe standoff distance. When an UNVENTED TRU WASTE DRUM is carefully inserted or removed from a blast-mitigation device (e.g., Drum Venting System chamber) in preparation for venting, the UNVENTED TRU WASTE DRUM is not perturbed or moved in such a way to cause a deflagration. Also, the UNVENTED TRU WASTE DRUM will not be exposed to any activities that will cause it to deflagrate when it is in storage. When the UNVENTED TRU WASTE DRUM is stored above-ground, the requirements of LCO 3.4.1 apply.

UNVENTED TRU WASTE DRUMs have been discovered in the general population of above-ground TRU WASTE containers. After retrieval of containers from Trenches A through D and Pit 9, all drums (e.g., 30 and 55

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A3.4 TRU WASTE CONTAINER MANAGEMENT

A3.4.2 UNVENTED TRU WASTE DRUM HANDLING and TRANSPORT

gal drums) will be treated as unvented until demonstrated to be vented, OVERPACKED, OR DOUBLEPACKED.

Drums without a vent or an obviously degraded vent are considered UNVENTED TRU WASTE DRUMs subject to this LCO because they are sufficiently sealed to allow the accumulation of flammable gas.

Other TRU WASTE containers at TA-54, Area G may not have a vent. However, these containers either do not have the capability of providing enough of a seal to contain any hydrogen build-up, or they are so robust that they would be able to withstand the effects of a deflagration. All of these 'other' TRU WASTE containers without a vent are capable of providing containment for the radiological contamination. These other containers include (but are not limited to) SeaLand Containers (Cargo Containers), transportainers, SWBs, metal boxes, corrugated metal boxes, metal-encased wood boxes, metal spheres, Bolas Grande Spheres, FRPs, plastic wrapped waste and CMPs. Per DOE-STD-5506-2007, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities*, which cites results of Idaho Drum Deflagration Tests, containers of sound integrity that are overpacked, SWBs, direct loaded RH canisters with welded lids, and RH canister with nested metal drums can be credited to prevent lid loss and ejection of material during a deflagration. The DOE-STD-5506-2007 cites the following: "For SWB, RH canister with nested metal drums, and the overpacked drum, a significant release from the potential venting through the outer container seal is not expected."

The area of Applicability of this LCO is TA-54, Area G since UNVENTED TRU WASTE DRUM HANDLING and TRANSPORT occurs throughout TA-54, Area G, by definition.

CONDITION A and associated ACTIONS and COMPLETION TIMES

CONDITION A is entered when an AFFECTED UNVENTED TRU WASTE DRUM is discovered to be HANDLED or TRANSPORTED in Area G and does not have a lid restraining device installed. Under this CONDITION, the following ACTIONS are established to mitigate the risk associated with the AFFECTED UNVENTED TRU WASTE DRUM and to restore compliance with the LCO.

ACTION A.1 requires that HANDLING and TRANSPORT of the AFFECTED UNVENTED TRU WASTE DRUM be stopped IMMEDIATELY. Performing this ACTION IMMEDIATELY represents the most conservative COMPLETION TIME available to the operator to mitigate a situation that could lead to worker injury or radiological release. This ACTION removes the AFFECTED drum from LCO Applicability since HANDLING and TRANSPORT have been stopped and there should be no movements that would initiate a deflagration.

ACTION A.2 requires placing a lid restraining device on the AFFECTED UNVENTED TRU WASTE DRUM to restore compliance with the LCO

APPENDIX A BASES

A3.4 TRU WASTE CONTAINER MANAGEMENT

A3.4.2 UNVENTED TRU WASTE DRUM HANDLING and TRANSPORT

	<p>prior to resuming HANDLING or TRANSPORT of the AFFECTED UNVENTED TRU WASTE DRUM.</p>
CONDITION B and associated ACTIONS and COMPLETION TIMES	<p>CONDITION B is entered when an AFFECTED UNVENTED TRU WASTE DRUM is discovered to be TRANSPORTED in Area G and does not have a shielding/engineered barrier between the UNVENTED TRU WASTE DRUM and the worker, and does not have a safe standoff distance ≥ 30 ft between the UNVENTED TRU WASTE DRUM and the worker. Under this CONDITION, the following ACTIONS are established to mitigate the risk associated with the AFFECTED UNVENTED TRU WASTE DRUM and to restore compliance with the LCO.</p> <p>ACTION B.1 requires that TRANSPORT of the AFFECTED UNVENTED TRU WASTE DRUM be stopped IMMEDIATELY. Performing this ACTION IMMEDIATELY represents the most conservative COMPLETION TIME available to the operator to mitigate a situation that could lead to worker injury or radiological release. This ACTION removes the AFFECTED drum from LCO Applicability since TRANSPORT has been stopped and there should be no movements that would initiate a deflagration.</p> <p>ACTION B.2.1 requires placing a shield/engineered barrier between the UNVENTED TRU WASTE DRUM and the worker.</p> <p>ACTION B.2.2 requires establishing a safe standoff distance ≥ 30 ft between the UNVENTED TRU WASTE DRUM and the worker.</p> <p>Completion of either ACTION B.2.1 or ACTION B.2.2 restores compliance with the LCO prior to resuming TRANSPORT of the AFFECTED UNVENTED TRU WASTE DRUM.</p>
SURVEILLANCE REQUIREMENTS	
SR 4.4.2.1	<p>Prior to initiating an UNVENTED TRU WASTE DRUM HANDLING or TRANSPORT activity, the UNVENTED TRU WASTE DRUM must be VERIFIED to have a lid restraining device installed. The FREQUENCY of prior to initiation of the activity ENSURES that the safety function is properly established before the LCO is required to be applicable</p>
SR 4.4.2.2	<p>Prior to initiating an UNVENTED TRU WASTE DRUM TRANSPORT activity, the UNVENTED TRU WASTE DRUM must be VERIFIED to have a shielding/engineered barrier between the UNVENTED TRU WASTE DRUM and the worker, or maintain a safe standoff distance ≥ 30 ft between the UNVENTED TRU WASTE DRUM and the worker. The FREQUENCY of prior to initiation of the activity ENSURES that the safety function is properly established before the LCO is required to be applicable.</p>
REFERENCES	None

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A3.5 VEHICLE/EQUIPMENT CONTROLS

A3.5.1 Vehicle/Equipment Safety Control – Refueling Location

BACKGROUND SUMMARY Liquid fueled vehicles/equipment are required to perform certain operations within Area G. Refueling operations increase the likelihood for a fuel spill which could result in a pool fire if an ignition source were present. Movement of the liquid fuel to a refueling location within Area G also increases the likelihood for a vehicle/equipment accident with subsequent fuel spill and fire if an ignition source is present. In the event of a pool fire near radiological material, a release of that material could result. Therefore, refueling operations are required to occur at a location sufficiently separate from MAR to ensure that a pool fire would not subject the radiological material to a heat flux that would result in ignition of the waste material. Equipment that must be refueled in place SHALL be refueled in accordance with applicable fuel limitations for the area.

These controls reduce the likelihood that large liquid fuel pools can form in proximity to radioactive waste and create a fire hazard to the MAR located in DEFINED AREAs.

APPLICATION TO SAFETY ANALYSIS This control addresses a fuel spill during vehicle/equipment refueling activity. The safety function of this control is to reduce the likelihood and size of fires associated with refueling near radioactive waste that could result in the release of MAR. The safety analysis determined that separating refueling locations with > 7 gal of flammable/combustible liquids by the specified Minimum Refueling Separation Distances from MAR ensures that a fuel spill and subsequent fire would not impact stored MAR.

Fuel pool fires of less than or equal to 7 gal were determined to have minimal risk due their short burn duration and limited MAR involvement.

LCO This SAC requires the establishment of a Minimum Refueling Separation Distance between vehicle/equipment refueling locations and DEFINED AREAs. These Minimum Refueling Separation Distances are presented below:

Capacity of Refueling Vehicle at Refueling Location	Minimum Refueling Separation Distance to DEFINED AREA with non-metal TRU WASTE containers (ft)	Minimum Refueling Separation Distance to DEFINED AREA with only METAL CONTAINERS (ft)
> 7 gal and ≤ 100 gal	43	22
> 100 gal and ≤ 500 gal	71	45
> 500 gal and ≤ 5,000 gal	203	141

The Minimum Refueling Separation Distances shown above are based on a fuel pool fire involving the maximum specified refueling vehicle capacity. The Minimum Refueling Separation Distances represent the distances from the edge of the pool fire necessary to prevent ignition of non-metal containers or ignition of material in METAL CONTAINERS, plus the radius of the pool fire. This thus

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A3.5 VEHICLE/EQUIPMENT CONTROLS

A3.5.1 Vehicle/Equipment Safety Control – Refueling Location

corresponds to the total distance between a refueling location and the applicable DEFINED AREA. These distances are based on a pool fire occurring on a level, smooth surface. Relatively few locations at Area G are level and smooth; however, these distances are judged to be conservative because the rough dirt soils or rough asphalt surfaces that predominate at Area G will serve to absorb the fuel or limit the spread of a pool fire such that the actual extent of the pool will be less than that assumed. Also, the location of the fuel spill is assumed to be at the refueling vehicle. It is recognized that hoses will typically be used to transfer fuel from the refueling vehicle to the refueled vehicle/equipment; however, any bounding spill is expected to occur at the refueling vehicle location because a spill from the hose end is readily detected and isolated since personnel are necessarily in attendance and several means exist to readily stop the spill (e.g., securing the fuel pump, closing the isolation valve).

The Minimum Refueling Separation Distance that must be established is the shortest distance from the boundary of a designated vehicle/equipment refueling location to the boundary of the nearest DEFINED AREA. To account for the radius of an actual fuel pool spill, this Minimum Refueling Separation Distance takes into consideration the fuel capacity of the refueling vehicle.

APPLICABILITY This LCO is applicable in OPERATION and WARM STANDBY since MAR may be present in DEFINED AREAS in these MODES.

This LCO is applicable to Area G DEFINED AREAS (excluding LAAs) when a refueling vehicle with a capacity of > 7 gal liquid fuel is present in the refueling location. When a refueling vehicle is not present in the refueling location, no hazard exists and the LCO is not needed. Vehicles in transit or otherwise not undergoing refueling operations are not included in the LCO Applicability since controls for these situations are provided by other SACs.

This LCO is not applicable to refueling locations involving only propane cylinders since a propane leak will not result in a fuel pool fire. This LCO separation distance is not applicable to the hose between the refueling vehicle and the vehicle or equipment undergoing refueling. The hose is stationary and constantly ATTENDED, so a significant leak would be immediately addressed. This LCO is not applicable to refueling vehicles located downhill from the retrieval equipment or vehicle undergoing refueling at RETRIEVAL AREAS. Downhill location makes intrusion of liquid fuel into the RETRIEVAL AREA impossible. A pool fire above-ground would not affect the below-ground MAR. The radiant heat flux diminishes with horizontal distance and with height above the burning fuel, and is negligible at elevations lower than that of the burning fuel pool.

This LCO is also not applicable to vehicles/equipment with fuel capacities ≤ 7 gal liquid fuel. A refueling location with a quantity of ≤ 7 gal of flammable/combustible liquids can result in agglomerated burning that would affect radioactive waste. However, the small quantity of fuel burns so quickly that there is insufficient time to pressurize the COMPLIANT container to cause lid loss and ejection of waste. A refueling location with ≤ 7 gal of flammable/combustible liquids was determined to

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A3.5 VEHICLE/EQUIPMENT CONTROLS

A3.5.1 Vehicle/Equipment Safety Control – Refueling Location

	have minimal risk due to the short burn duration and limited MAR involvement, so the controls of this LCO are not applicable.
CONDITION A and associated ACTIONS and COMPLETION TIMES	<p>CONDITION A is entered when the Minimum Refueling Separation Distance is not met. A separate entry CONDITION is allowed for each DEFINED AREA.</p> <p>ACTION A.1 requires that refueling of the AFFECTED vehicles/equipment SHALL be stopped IMMEDIATELY. The COMPLETION TIME of IMMEDIATELY ensures the refueling activity is stopped as soon as possible to minimize the potential for a fuel spill or leak that can lead to a fuel pool fire involving the MAR in a DEFINED AREA.</p> <p>ACTION A.2 requires the refueling vehicle to be moved to a location at or beyond the minimum specified Refueling Separation Distance (for the type of containers within the DEFINED AREA). Thus, completion of this ACTION restores compliance with the LCO. The 4-hr COMPLETION TIME minimizes the time at risk, considering the very low likelihood of a fuel spill and subsequent fire in the immediate vicinity of the AFFECTED DEFINED AREAS during this short time period, while allowing sufficient time to complete the ACTION, which may involve movement of vehicles and posting or barricading areas.</p>
SURVEILLANCE REQUIREMENTS	
SR 4.5.1.1	<p>This SR requires VERIFICATION that the Minimum Refueling Separation Distances are met prior to establishing a new refueling location or modifying the boundaries of an existing refueling location and prior to establishing a DEFINED AREA or changing the container type within a DEFINED AREA.</p> <p>The FREQUENCIES ENSURE that the Minimum Refueling Separation Distances are met prior to commencing refueling activities. Any changes to refueling locations or DEFINED AREA locations or container types would also require performance of the SR, ENSURING that the LCO will continue to be met.</p>
REFERENCES	<p><i>Calculation for Radiant Energy at a Distance Away from Object for “Ordinary” Combustibles and Pool Fires</i>, SB-DO: CALC-11-014, R1, August 2011.</p>
