EA Operational Awareness Record	**Report Number:** EA-LANL-2015-07-07
Site: Los Alamos National Laboratory	**Subject:** Review of Transuranic Waste Facility 90% Draft Documented Safety Analysis and Technical Safety Requirements Submittals
Dates of Activity: 07/07/2015 – 08/06/2015	**Report Preparer:** James O. Low

Activity Description / Purpose:

The Office of Environment, Safety and Health Assessments within the Office of Enterprise Assessments (EA) reviewed the 90% Draft Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR), which Los Alamos National Security, LLC (LANS) submitted to the Los Alamos Field Office (LAFO) on July 1, 2015 (Ref. 1). The EA review consisted of two parts: 1) a review of the actions taken to address comments from previous EA reviews of the Preliminary DSA (Ref. 2) and draft DSA Chapters 1-4 (Ref. 3) and 2) a review of the 90% DSA and TSR. This EA operational awareness activity was part of a planned multi-phase review focusing on evaluation of the technical adequacy of select safety basis documents including the DSA, TSR, and LAFO Safety Evaluation Report (Ref. 4).

ATTACHMENTS:

ATTACHMENT 1 – EA Review Open Comments
Draft TWF DSA Chapters 1-4 Revision – 12-22-2014
PDSA 1.0 and 3.1
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ATTACHMENT 2 – EA Review New Comments
DSA-TWF-001, Documented Safety Analysis for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)
TSR-TWF-002, Technical Safety Requirements for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

Result:

Previously, LANS developed Draft DSA Chapters 1-4 in response to comments (which were provided by LAFO and EA) on Preliminary DSA Revision 1.0 and 3.1. Subsequently, review comments to Draft DSA Chapters 1-4 were transmitted to LANS by LAFO (Ref. 6). Using the 90% DSA submittal, EA reviewed the responses to the previous comments on the Preliminary DSA and Draft Chapters 1-4 to verify closure or determine the status of open issues. LANS has adequately addressed most EA comments (Refs. 2 and 3) in the 90% DSA submittal, but some previously identified issues have either not been addressed or have been partially addressed. Significant open comments from the review of Draft Chapters 1-4 include:

- Lack of analysis of high energy chemical reactions (see Attachment 1, Comments 3 and 8)
- Failure to identify controls related to the Waste isolation Pilot Plant Waste Acceptance Criteria, which serve as initial conditions and assumptions in the safety basis (see Attachment 1, Comments 4 and 8)
- Missing discussion and performance criteria evaluation of select waste containers that are credited as design features (e.g., pipe overpack containers) as well as serving as initial conditions and assumptions in the safety basis (see Attachment 1, Comments 4 and 5)
- Incomplete technical basis for hazardous material release consequences (see Attachment 1, comment 10).

In addition, LANS has postponed resolution of a number of previously identified Preliminary DSA open comments that are related to the safety functions, performance criteria, and functional requirements of the active safety systems, structures, and components (SSCs) from the 90% DSA submittal to the 100% DSA. The following potential concerns * are based on the remaining significant open Preliminary DSA comments:

- The continued deferral of responses to comments regarding the performance criteria, evaluation of performance, and functional classification of SSCs increases the risk that the as-built facility may not fully incorporate the safety functions defined in the DSA (see Attachment 1, Comments 6, 11, 12, 18, 19, 22, and 23)
- Overall, the fire suppression system (and supporting systems) design described in the 90% DSA is adequate but not always supported by current design media (e.g., drawings and calculations) (see Attachment 1, Comments 13, 14, 15, 16, 17, 20, 21, 24, 25, and 26).

Updated verification status of the previous EA comments that remain open is included as Attachment 1.

New comments based on review of the 90% DSA and TSR were transmitted to the LAFO (Ref. 5) and are included as Attachment 2.

*Potential concerns are summary issue statements derived from open comments that, if not resolved in the final safety basis submittal and as-built design media, may constitute significant non-compliances to nuclear safety requirements.

EA Participants	**References (Key Documents, Interviews, and Observations)**
1. James O. Low (lead) 2. Kevin E. Bartling 3. Roy R. Hedtke 4. David J. Odland 5. Joseph J. Panchison 6. Jeffrey L. Robinson 7. James H. Wicks, Jr.	1. AD-NNHO-15-127, *Memorandum from Associate director Nuclear and High Hazard Operations (LANS) to Mr. John Krepps (NNSA), Subj: Submittal of 90% Transuranic Waste Facility (TWF) Documented Safety Analysis (DSA) and Technical Safety Requirements (TSRs)*, July 1, 2015 2. Memorandum: T. Staker to K. Lebak, *Independent Oversight Review of the Los Alamos National Laboratory Transuranic Waste Facility Safety Basis Design and Development – July 2014*, July 24, 2014 3. E-mail: J. Low to J. Romero (NNSA/LAFO), EA-31 Comments to Draft LANL TWF Chapters 1-4 DSA Submittal, 12/22/14 1:24 PM EST 4. DOE/HQ/EA-30, *Plan for the Office of Enterprise Assessments Targeted Review of the Safety Basis and Facility Design at the Los Alamos National Laboratory Transuranic Waste Facility (FY2015 – FY2016)*, approved October 29, 2014 5. E-mail: J. Low to J. Romero 9NNSA/LAFO), RE: Review of 90% for TWF DSA, 8/5/15 6:32 AM EST 6. NA-LA Letter OPS:26JR-610400, *John A. Krepps, COR, NA-LA to Cheryl D. Cabbil, ADNHHO, LANS, Subject: TWF-Comments for Review of the Transuranic Waste Facility (TWF) DSA, Revision to Address TWF PDSA Revision 3.1 Comments*, dated January 26, 2015.

Were there any items for EA follow-up? ☒ Yes ☐ No

EA Follow-up Items:

1. Evaluate disposition of Attachment 1 issues in the 100% DSA and TSR submittal (scheduled for February 2016).
2. Evaluate disposition of Attachment 2 comments in the 100% DSA and TSR submittal (scheduled for February 2016).

ATTACHMENT 1- EA Review Open Comments
Draft TWF DSA Chapters 1-4 Revision – 12-22-2014
PDSA 1.0 and 3.1
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No.	Page	Section/Para/ Line	Reviewer Comment	A/S	Rev.	Resolution
Comments below are based on the Redline Strikeout PDF Version of the draft DSA (10-30-2014). Comments 1 – 58 was transmitted (E-mail) to LAFO on 12/22/2014 Comments 59 – 65 was transmitted to LAFO on 12/17/2014 2nd Table (currently open issues carried from PDSA Review)						
1	1-35 2-27	1.7 2.6.3	**Issue:** In sizing the retention basin, the volume of fire flow (1500 gpm) was not considered (reference calculation 11-001-CCAL-003), which only address the 25 year storm event, sprinkler demand, and hose stream associated with the sprinkler system design. Fire suppression is not planned for the characterization trailers, and other support structures. IFC-2009 paragraph 2704.2.2.6.3 requires that drains (and discharge retention) shall be sized to carry the volume of the fire flow and the volume of a 25 year storm event. Therefore, LANL needs to determine the worst case retention basin sizing based on the 25 year storm and the fire flow requirement of 1500 gpm for two hours. **Action:** Include consideration of IFC required fire flow in the sizing criteria for the retention basin.	A	JJP	**LANS:** The comment was not forwarded to LANS by the SBRT. **90% DSA Verification:** The 90% DSA, Section 2.7.3 states: • The retention basin is sized to provide capacity for a 25-year frequency two-hour storm event at the same time that a fire occurs in one of the storage buildings allowing for 30 minutes of fire suppression water also going to the retention basin. Some buildings and/or structures or portions thereof are not sprinklered and are required to rely on the IFC fire flow requirement of 1500 gpm fire flow for two hours (IFC, 2012, App B, Table B105.1). Without considering the 25 year storm event, fire flow water discharge is 180,000 gallons. Current capacity of the retention basin is 123,700 gallons. The fire water storage tank was sized with consideration for the fire flow requirement. Please reconcile. The item remains open. It affects code compliance, but not nuclear safety.

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2	2-28	2.6.3, para 1	**Issue:** The runoff retention basin is sized to provide capacity for a 25-year frequency two-hour storm event at the same time a fire occurs in one of the storage buildings allowing for 30 minutes of fire suppression water…..The 30 minutes is a minimum requirement from NFPA 801 and DOE-STD-1066-99. However, STD-1066-99 additionally requires the consideration of actual time e.g. emergency response time, hazard evaluation time and isolation of the water supply time which can be in excess of the minimum, 30 minutes.. **Action:** Evaluate the actual response time to isolate the fire suppression systems' water supply and adjust the retention basin volume as appropriate.	A	PFF JJP	**LANS:** The comment was not forwarded to LANS by the SBRT. **90% DSA Verification:** The item remains open. It affects code compliance, but not nuclear safety.
3	3-109	3.5.10.1/1	**Issue:** This design basis accident does not address the potential for accidents involving incompatible chemicals or adverse chemical reactions that generate heat and gas in excess of the design capacity of the filter vents and waste container. Failure to address these potential accident initiators could result in an incomplete set of controls. **Action:** Include analysis of incompatible chemicals or adverse chemical reactions in this design basis accident scenario or develop an additional design basis accident.	A	DJO	**LANS:** The WIPP incident is under investigation. The Facility will consider changes to the DSA based on the final findings. (7/1/15) **90% DSA Verification: Issue remains Open.** The WIPP AIB reports have been issued and actions to address adverse chemical reactions are ongoing. OPS:26JR-610400 Enclosure 2 Comment #266
4	3-112 4-151	3.5.10.4/1 4.5.8.2/1ff	**Issue:** The Waste Container Acceptance Criteria (*Preventive SAC*) description does not contain the detail or specificity necessary to fully delineate the required safety class controls. Although the specified controls are necessary for the SAC, they may not be sufficient to provide assurance that the control set is adequate. For example, the SAC states that "waste containers are to be required to meet either the performance testing requirements in 49CFR173 **or** the inspection requirements in the WIPP WAC" (or DOE-STD-5506), but the containers must meet **both** requirements. Further, the description of the SAC indicates the "performance testing requirements in 49CFR173" must be met	A	DJO	**LANS:** The SAC description was updated. (7/1/15) **90% DSA Verification: Partially implemented.** The TRU waste containers have been designated as safety class SSCs but the

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			without indicating whether this is specific to the requirements in 49CFR173.465 or includes other requirements. The SAC description also does not mention the quality control requirements of 49CRF173.475, which are critical to ensuring the waste container is loaded and configured in accordance with the packaging requirements (and tested configuration) and more applicable to newly generated waste than the legacy waste inspection requirements in the WIPP WAC. **Action:** Revise the SAC to ensure that the description of the controls has the detail necessary to guide the development and implementation of the process for purchasing, filling, and closing of the container.			performance criteria and evaluation do not fully address the original comment. OPS:26JR-610400 Enclosure 2 Comment #267
5	4-87	4.2.7.4/3	**Issue:** The performance criteria indicate the "POCs shall be vented (exterior shell only)." The CH-TRAMPAC indicates that the pipe component and the overpack will be vented and the pipe component would need a vent in order to allow hydrogen to escape. **Action:** Clarify the filter vent requirements for the POCs.	A	DJO	**LANS:** The performance criteria and associated evaluation have been revised. (7/1/15) **90% DSA Verification: Issue not resolved.** Table 4-14 specifies that the POC shall be vented but does not specify the need for two vents; one on the pipe component and one on the drum. OPS:26JR-610400 Enclosure 2 Comment #288
6	4-99	Table 4-13/2	**Issue:** The design criteria column for the SPCS has two elements in this table entry. The first is to "*Remain functional or fail-safe during PC-2 NPH seismic events.*" The second is to "*remains in safe mode through SDC-3*." The codes and standards entry indicates "LANL ESM Chapter, Section II [LANL 2010c] that implements DOE STD-1189-2008 [LANL 2010c]." This entry is incomplete.	A	DJO	**LANS:** Design criteria were moved from the DSA to FDDs to meet 3009 format. (7/1/15) **90% DSA Verification: Partially implemented.**

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			The appropriate reference for the design response spectrum used to establish the SPCS setpoint, which is related to the SDC-2 design of the storage buildings is the LANL ESM Chapter **5**, Section II. The appropriate reference for the design response spectrum for the SDC-3 design basis earthquake is LANL ESM **Chapter 5, Section III**. **Action:** Revise the table entry to more accurately describe the required design criteria.			The applicable table in Chapter 4 has been updated but the performance criteria do not specifically address the need to remain in safe mode during a seismic event that exceeds SDC-2 levels. OPS:26JR-610400 Enclosure 2 Comment #289
7	4-115	4.3.1.2, Table 4-6	**Issue:** FSS-Backup Diesel Generator, The Performance Criteria states, Backup Diesel generator shall have sensors……it lists 3 conditions which will result in an alarm. The conditions are inconsistent with NFPA 110, Standard for Emergency and Standby Power Systems and NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection. **Action:** Revise this section to include sensing and alarming conditions consistent with recognized codes and standards and/or identify the code(s) and standard(s) being utilized.	A	PFF JLR	**LANS:** The comment was not forwarded to LANS by the SBRT. **90% DSA Verification:** The item remains open. Note: The alarm signals (reference Table 4-23), operator rounds, and LCO actions (3.2.1) must be coordinated to ensure continued operability and conformance to the LCO conditions.
8	4-139 4-151	4.5.1/1ff 4.5.8/1ff	**Issue:** Throughout the analysis in Chapter 3, which uses as its basis the approach from DOE-STD-5506, there is an assumption that the waste received at TWF will meet the WIPP WAC for **newly generated waste**. Although the analysis and the associated controls are explicit in addressing controls related to radiological MAR and packaging, the analysis and the control selection do not always fully address the chemical and physical properties that are inherent in meeting the WIPP WAC criteria. This may lead to an incomplete understanding of the consequences of not meeting WIPP WAC criteria (for example, the potential for high energy chemical reactions in the waste containers) and an incomplete set of hazard controls. **Action:** Considering the assumptions in the WIPP WAC, address upset conditions for all the WIPP WAC requirements, including chemical and	A	DJO	**LANS:** The performance criteria and associated evaluation have been revised. (7/1/15) **90% DSA Verification: Issue not resolved.** Energetic chemical reactions have not yet been addressed – as noted above. The WIPP WAC is not identified as a specific administrative control and is

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			physical properties, so that the importance of all the WIPP WAC requirements to the TWF safety basis are clearly delineated and an appropriate control set established.			discussed only in Chapter 5 in conjunction with the interface with upstream facilities. OPS:26JR-610400 Enclosure 2 Comment #300
9		General Comment PDSA Chap 6 and PCSE	**Issue:** DOE STD-3007 states that "The events identified in the hazard analysis should be those covered in CSE" and "all credible contingencies shall be identified, analyzed, and documented," and "assumptions about the process and scope limitations that impact the CSE should be stated and justified." It appears that the focus of the CSE is on normal operations and abnormal operational events. For each one of the DBAs, a discussion of criticality safety during those events appears missing. The PDSA asserts that "breach of multiple containers with the addition of fire suppression water or water from some other source has been considered." This is not clear from the PCSE and both the PDSA and PCSE lack technical details about the analysis. The CSE did not contain any direct discussion about potential accumulation of fissile material in the retention pond during a DBA fire scenario. The PDSA discussion of "Double Contingency" is a generic discussion and does not discuss how the TWF meets the applicable requirements for double contingency. **Action:** Determine whether the PDSA/PCSE contains sufficient rigor, reflects the current design, and has appropriately considered events in the hazards analysis and all credible contingencies.	A	TGH RRH	**LANS:** CSE was updated. (7/1/15) **90% DSA Verification: Issue partially addressed.** The statement that the CSE was updated does not respond to the first comment. The hazards analysis still does not cover credible contingencies from the CSE. There are several control assumptions in the CSE that are not captured in the hazard/accident analysis. The CSE does not address breach of multiple containers with the addition of fire suppression water. The draft CSE does discuss potential accumulation of fissile material in the retention pool with the result that it will not result in a criticality excursion. The third comment concerning application of the double contingency has not been completed. Chapter 6 still does not adequately address "double contingency" in §6.4.3 as required by STD-3009.
10	3-4	3.2.1.1	**Issue:** It is stated that WIPP "has set the precedent for not evaluating RCRA constituents of mixed TRU waste …" . It is implied that this precedent was used in WIPP safety basis application. However, there is no WIPP safety basis reference provided to understand the technical basis for this precedent.	A	JOL	**LANS:** Under investigation. (7/1/15) **90% DSA Verification: Issue not resolved**

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			Action: Provide the WIPP safety basis references and summarize the technical basis for the precedent of not evaluating RCRA constituents of mixed TRU waste. Note … This was a PDSA 1.0 comment #10…12/15/14 verification indicated : *Partially Implemented. The technical basis for selection of Beryllium as the bounding chemical of concern was not provided.*			OPS:26JR-610400 Enclosure 2 Comment #302
11	4-44	Table 4-15	**Issue:** The functional requirements and design criteria for the inertia block (e.g. couple the seismic switch to the ground (motion)) and seismic mounting of the switch are not included in the table. The PC-2 functions of the enclosure (wall) are not included. The requirements are addressed in the design. **Action:** Include the important functional requirements and design criteria for the SPCS components in the table.	A	DJO	**LANS:** The following PC was added: *The SPCS foundation shall protect the SPCS and SPCS conduit from SDC-3 peak ground acceleration of 0.48 g.* (7/1/15) **90% DSA Verification: Partially implemented.** The protective function of the foundation has been addressed but the design feature that ensures the inertia block couples the sensor to the ground motion was not. OPS:26JR-610400 Enclosure 2 Comment #304
12	4-44	Table 4-15/1/1	**Issue:** The FMEA does not appear to address all of the design analysis requirements from IEEE STD-379-2000. For example, the interconnection of the seismic switch circuits through the normal and ground lines in PP-13 and the potential effects of short circuits and open circuits on the seismic switch actuation relays are not specifically addressed. Similarly, the potential for common logic faults in the redundant microprocessors is not discussed, though the FMEA and the PDSA identify the need for a software/firmware quality assurance program/plan. **Action:** Address the interface design between the safety and non-safety systems with enough detail to support an understanding of the potential system	A	DJO	**LANS:** Design criteria were moved from the DSA to FDDs to meet 3009 format. (7/1/15) **90% DSA Verification: Issue not resolved.** The revised section of the DSA does not fully evaluate the system. For example, the evaluation does not address the potential for common mode failures in the software and firmware or the independence

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			interactions and a determination that the design appropriately accounts for those potential interactions. Analyze the failure modes and effects of the seismic switch and associated firmware and software sufficiently to support the development and execution of a quality assurance plan for the SPCS.			of the seismic cutoff switches from the non-safety electrical system. OPS:26JR-610400 Enclosure 2 Comment #305

TWF PDSA R3.1 HSS Open Comment Resolution (12-15-14)

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13	HSS-FSS (3.1)	2	4-21	PDSA Table 4-1 FSS Fire Water Tank	**Issue:** The fire water supply tank shall have a means of freeze protection to maintain the water tank temperature above 32°F. The tank is specified as having a temperature sensor that provides an alarm signal. The P&ID F-6001 indicates that the temperature sensor initiates the circulating pump in the tank heater piping loop. This performance criterion is not listed in Table 4-1. **Action:** Add the performance criteria for starting the circulating pump in the tank heating freeze protection loop. (JJP)	**LANS:** The circulating pump has no safety function. The tank top and sides have R-10 insulation to protect the water from freezing per11-001-MCAL-014 [AECOM 2013h]. No change to the DSA required. ENGINEERING will update the P&ID to reflect the appropriate temperature sensor. **December 2014 Verification:** ***Partially implemented.*** Both Table 4-1 and 4-15 identify the safety functions related to fire water tank heating as tank insulation (rating) and the tank temperature alarm (45°F). Section 4.3.1.4.a identifies the alarm setpoint as 40°F, which should be reconciled with the tables above. The P&ID requires revision and the final design will require evaluation to determine whether the alarm provides adequate warning of the loss of heating for the tank.

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						Additionally, the performance criteria for safety significant tank temperature element TE-004 that provides a signal to the tank heating loop pump FPP-1 controller should be addressed in Table 4-15. **LANS:** ENGINEERING will update the P&ID to reflect the appropriate temperature sensor. (7/1/15) **90% DSA Verification: Issue not resolved**. The P&ID is still required to be changed to reflect the appropriate safety significant low temperature alarm sensor.
14	HSS-FSS (3.1)	3	4-21 4-97	PDSA Table 4-1 FSS Fire Water Tank Section 4.3.1 Table 4-16	**Issue:** The fire water supply tank shall have a means of freeze protection to maintain the water tank temperature above 32°F. According to P&ID F-6001, the temperature controller for the heater in the freeze protection loop is initiated from a safety significant temperature sensor located in the 12 inch tank outlet piping that is heat traced rather than from the fire water tank. **Action:** Add Design Criteria for initiation of the heater loop and revise the P&ID accordingly. (JJP)	**LANS: Deferred to 90% DSA submittal;** ENGINEERING will update drawing(s) to reflect the correct temperature sensor. **December 2014 Verification: NA** **LANS:** ENGINEERING to provide at 100% to reflect As-built. (7/1/15) **90% DSA Verification: Issue not resolved.** The circulating pump and heater are not credited safety controls however the P&ID is still required to be changed to reflect the appropriate safety significant low temperature sensor used during operator rounds for tank water temperature monitoring.

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15	HSS-FSS (3.1)	6	4-24, 2-3	PDSA Table 4.1, SDD, page 2-3, Calc page 1 of 5	**Issue:** There are discrepancies describing the FSS freeze protection loads. For example, in the PDSA the loads are described as 18.5 KW for at least 22 hours. The calculation (ref. Diesel Generator Sizing, 11-001-ECAL-014, rev 0) describes the freeze protection loads as entered in Step 1 of Section 5.0, Results and Conclusions. The loads in Step 1 are documented as 20.5 KW. The SDD (ref. Fire Protection System Design Description for the TA-63 TRU Waste Facility Project, 11-001-SDD-002, rev 1) references only the heat trace and the unit heaters which equal 17 KW. Please clarify the freeze protection loads. **Action:** Correct the discrepancy associated with required run time for the diesel generator. (JLR)	**LANS: Deferred to 90% DSA submittal;** ENGINEERING will update SDD to correct the discrepancy. **December 2014 Verification:** *Not implemented.* The diesel generator loading (attached loads and times) in the DSA and supporting calculations must match. Both documents should demonstrate that the generator can perform its intended safety function. The resolution above only addresses the SDD. When finalized, the SDD should reflect the information in the DSA and supporting calculation. **LANS:** ENGINEERING to provide at 100% to reflect As-built. (7/1/15) **90% DSA Verification: Issue not resolved.**
16	HSS-FSS (3.1)	8	4-31	Table 4-1, 4.3.1.i FSS-Nitrogen System, Dry Pipe Nitrogen Gas System Sizing Calculation, (ref. 11-001-MCAL-011, rev 0)	**Issue:** The air supply for the dry pipe sprinkler system shall be capable of restoring normal air pressure in the system within 30 minutes in accordance with NFPA 13. Documentation should demonstrate compliance that the nitrogen supply cylinders are sized adequately to meet this requirement. The Dry Pipe Nitrogen Gas System Sizing Calculation (ref. 11-001-MCAL-011, rev 0) does not include this requirement as a criteria or design input. **Action:** Provide appropriate documentation to demonstrate compliance with the nitrogen system being capable of restoring normal air pressure	**LANS -** Table 4-16 of the DSA has been updated to include this performance criterion. **LANS: Deferred to 90% DSA submittal;** ENGINEERING will update the calculation to demonstrate compliance with NFPA requirements. **December 2014 Verification:** *Partially implemented.* Tables 4-1 and 4-16 include functional and performance requirements (with reference to the appropriate standard in Table 4-16) for the nitrogen supply. **LANS:** ENGINEERING to provide at 100% to reflect As-built. (7/1/15)

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					within 30 minutes in accordance with NFPA13. (JLR)	**90% DSA Verification:** NA-OPEN
17	HSS-FSS (3.1)	11	4-97	PDSA Table 4-16	**Issue:** A functional requirement for the fire water supply tank is to have a means of freeze protection. The analysis that determines the length of time that it takes for the fire protection water storage tank to reach 32 degrees F (11-001-MCAL-014 Rev A) uses non-conservative inputs (tank diameter, tank height) not consistent with the tank specification 21-4100 **Action:** Revise the calculation with appropriate inputs. (JJP)	**LANS: Deferred to 90% DSA submittal;** ENGINEERING will update the calculation to reflect the final as-built dimensions. **December 2014 Verification: NA** **LANS:** ENGINEERING to provide at 100% to reflect As-built. (7/1/15) **90% DSA Verification: Issue not resolved.**
18	HSS-FSS (3.1)	16	4-99ff	Table 4-16 e.	**Issue:** Much of the discussion under performance criteria and design criteria describes the interface between the electrical distribution system and the components that supply the FSS. This discussion would be more appropriate in the interface design section of Chapter 4. The description also encompasses both safety significant and non-safety sections, which may lead to future confusion for designers and safety analysts. The discussion does not address other potentially safety significant components that require power; such as, the diesel generator control panel, battery chargers, and safety alarm panel. **Action:** Correct the section to focus on the required safety significant functions and associated performance criteria. (DJO)	**LANS: Deferred to 90% DSA submittal;** ENGINEERING to provide information. **December 2014 Verification:** ***Not implemented.*** The description of the FSS-electrical distribution system in the revised DSA continues to include discussions of both safety and non-safety segments; e.g. the performance criteria refer to switchboard A servicing PP-20; implying that this is a safety function. The safety significant boundary flags on figure 4-4 indicate that PP-20 is non-safety. Nuclear Safety and Engineering inputs are necessary to determine the safety functions, performance criteria and design criteria. These should be captured in the DSA and implemented in the design. LANS: ENGINEERING to provide at 100% to reflect As-built. (7/1/15)

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ATTACHMENT 1- EA Review Open Comments
Draft TWF DSA Chapters 1-4 Revision – 12-22-2014
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New Cmt #	Document	No.	Page	Section/ Para/Line	Reviewer Comment	LANS Resolution
						<u>90% DSA Verification:</u> Partially implemented. The discussion of the electrical distribution system (EDS) in Table 4-23, as an interfacing system, has been altered, but the discussion does not accurately describe the function of the EDS. It states "The EDS is not required to support the safety function of the FSS as the back-up power electrical distribution system supports the Safety-Significant function." This statement is correct for instances where the EDS to TWF is lost, but under normal circumstances the EDS will supply the FSS. This should be discussed and technically evaluated (for example, load flow and electrical coordination studies) in the DSA. Discussion of the normal power to the diesel generator is also needed; particularly with regard to the battery charger.
19	HSS-FSS (3.1)	18	4-100	Table 4-16 e/1/1	**Issue:** The performance criteria specify that the "circuit breakers" will be SDC-2, LS-B The performance criteria should be applied to a number of other electrical components. **Action:** Revise the performance criteria to encompass all the electrical components that should be designed, installed and maintained to the seismic design criteria. (DJO)	**LANS: Deferred to 90% DSA submittal;** ENGINEERING to provide information. **December 2014 Verification: <u>*Not implemented*</u>.** Although it may be acceptable to defer updating the DSA until the 90% DSA submittal, the boundaries of the safety significant FSS-electrical distribution system must be clarified and the electrical components, in addition to the breakers, requiring seismic qualification identified (e.g. the automatic transfer switches). Otherwise, the procurement and testing of the components may not be acceptable. LANS: ENGINEERING to provide at 100% to reflect As-built. (7/1/15) **<u>90% DSA Verification:</u> Issue not resolved.**

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20	HSS-FSS (3.1)	21	4-105	PDSA Section 4.3.1.4c FSS Fire Water Pump Skid	**Issue:** It is not clear in the latest revised PDSA the sequence of operation of the two fire pumps. Only one pump shall operate while powered by normal offsite power or while powered by the emergency generator **Action:** Describe in more detail in chapter 2 or Section 4.3.1 the lead/lag performance expectations of the two pumps while powered both by normal and emergency power. (JJP)	**LANS: Deferred to 90% DSA submittal;** ENGINEERING to provide information. **December 2014 Verification: NA** - Notwithstanding the statement above, Section 4.3.1.4.c has added some detail regarding the pump start sequence. This information does not fully resolve the comment. When pumps are provided with normal electric power and the selector switch is in auto mode, the pump controller pressure switch will start the first pump. The second pump start pressure is set lower should the first pump not be able to maintain required system pressure. With a loss of offsite power, the diesel generator will be aligned to one pump via the manual mechanical interlock KIRK key so that the pressure switch actuation of the second pump would not be available. This scenario should be discussed in Section 4.3.1.4.c, the functional requirements are stated in Table 4-16, and the performance criteria for both scenarios however should be reconciled in Table 4-16. **LANS:** ENGINEERING to provide at 100% to reflect As-built. (7/1/15) **90% DSA Verification: Issue not resolved.**

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New Cmt #	Document	No.	Page	Section/ Para/Line	Reviewer Comment	LANS Resolution
21	HSS-FSS (3.1)	24	4-141 Ref W-N 2013ii	Diesel Fuel Tank Sizing Calculation, 11-001-ECAL-015,	**Issue:** NFPA 110 includes a recommended practice for sizing of fuel storage tanks and suggests a minimum capacity of at least 113% of either the low – fuel sensor quantity or the minimum run time based on the classification of the generator. The calculation (ref. 11-001-ECAL-015, Diesel Fuel Tank Sizing) appears to be conservative but does not reference or demonstrate compliance with this requirement. **Action:** Confirm that the diesel fuel storage tank capacity has been evaluated in accordance with applicable NFPA 110 requirements. (JLR)	**LANS: Deferred to 90% DSA submittal;** ENGINEERING will update the calculation to reflect the final as-built capacity and compliance with NFPA requirements. **December 2014 Verification: NA** **LANS:** ENGINEERING to provide at 100% to reflect As-built. (7/1/15) **90% DSA Verification: Issue not resolved.**
22	HSS-SPCS (3.1)	2	4-79 4-18	4.2.11.1/2/1 4.2.11.2/2/4	**Issue:** The sentence on page 4-79 states the "isolation fuse protects the SPCS contactor for an over current event." This conclusion is not self-evident and is not supported by discussion in the system evaluation subsection. For example, the isolation fuse is unlikely to provide any protection for the contactors arising from a downstream fault in the power distribution network (that is not seen in the control power circuitry). The coordination study for the electrical system has not been revised to reflect the new electrical distribution system design. **Action:** Resolve comment #59 from the previous HSS comments. (DJO)	**LANS:** No change to the DSA required. This level of detail will be provided in the SDD. **Deferred to 90% DSA submittal;** ENGINEERING will update the SDD. **December 2014 Verification:** *Not implemented.* Final verification will be completed later and could include the SDD; however, the DSA should summarily address the interfaces between the SPCS and the electrical distribution system in the system evaluation of Section 4.2.9.4. There are two interface points and both should be addressed from the point of electrical separation and coordination (particularly the protections in both circuits from overcurrent conditions). The original issue (comment #59 in HSS Verification 1.0) remains open and the original

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						response, which would address both interfaces, remains acceptable. **LANS:** ENGINEERING to provide at 100% to reflect As-built. (7/1/15) **90% DSA Verification: Issue not resolved.**
23	HSS-SPCS (3.1)	5	4-82	4.2.11.3/2	**Issue:** Although the basic design of the SPCS is acceptable, the method of achieving the necessary reliability of the SPCS (for example, through engineering design enhancements and/or further specification of inspections and tests) is an open item. This paragraph identifies that the SPCS does not meet the reliability criterion established in the supporting reliability, availability, maintainability and inspectability (RAMI) analysis for the SPCS, which is based on an analogy to the event frequencies in DOE-STD-3009 rather than on a technical standard. Based on the recommendations in the report, the PDSA indicates that to improve the reliability additional inspection and testing of the system is recommended and that specific details will be determined during construction. The RAMI analysis for the SPCS (11-001-TRPT-0008) was prepared by the Project in order to evaluate overall system performance and guide design, engineering, and other analyses. Review of revision 0 of the report resulted in the identification of a number of comments directed toward	**LANS:** No **December 2014 Verification:** *Partially implemented.* A new reliability calculation (11-001-CAL-001) for the SPCS was completed in June 2014. This calculation addresses the issue identified in the comment. This paragraph in the DSA requires modification to incorporate the new information provided in the calculation - since the existing paragraph is inaccurate. **LANS:** ENGINEERING to provide at 100% to reflect As-built.(7/1/15) **90% DSA Verification: Issue not resolved.** This section of the table has been revised, but the system evaluation does not address reliability, availability, or independence of the SPCS.

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					improving the technical defensibility of the analysis and the subsequent recommendations. These comments were addressed in revision 1 of the report, but the revised report also has a number of weaknesses. These include the technical basis of the criterion and the exclusion of important SPCS subcomponents in the reliability calculation. A recent LANL project review determined that additional analysis should be performed to identify engineering methods to meet the reliability criteria for the SPCS. This is not reflected in PDSA revision 3.1. Note: In a similar application, the design of the TA-55 seismic interlocks uses three detectors per channel arranged in a two-out-of-three logic. **Action:** Identify the risks and opportunities associated with the design and operation of the SPCS (such as, the tradeoff between installing more seismic switches and conducting frequent system testing and maintenance). Establish a path forward that leads to a technically defensible strategy for the design, construction, surveillance testing and maintenance of the system. (DJO)	

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24	HSS-Verification (PDSA 1.0)	2	4.3.1.4	Design Basis and Approach for the TA-63 TRU Waste Facility Project Phase B Design (ref. 11-001-TRPT-001, rev 0A)	**Issue:** The isolation of each Safety Significant fire water system limits the number of systems that are impaired during any one time. Section 3.3.4, Fire Water Supply Safety Significant of the Design Basis and Approach for the TA-63 TRU Waste Facility Project Phase B Design (ref. 11-001-TRPT-001, rev 0A) requires that the fire loop will be provided with sufficient sectional valve, such that no more than one sprinkler system will be place out of service because of a break in the loop. Currently Waste Storage Buildings 63-0154 and 0153 are both being supplied by the same 6-inch branch main (ref. TRU Waste Facility Project – Fire Protection Site Plan – drawing # C55443 and Site Utilities Fire Protection P&ID Drawing C55443). **Action:** Revise the fire water loop to include a separate branch main with appropriate isolation valves to meet the specified criteria. (JLR)	**LANS -** The drawings have been revised to indicate WSBs 63-0154 and 63-0153 are each serviced by a separate 6-inch branch main that can be placed out-of-service without affecting the other building. The most recent drawing number is already referenced in the approved PDSA **December 2014 Verification:** *Partially Implemented* – The drawings have been revised to ensure that WSBs 63-1054 and 63-1053 are each serviced by a separate 6 inch branch main. The isolation for these buildings should include adding an isolation valve between the two branch mains to avoid impairing both sprinkler systems upon a break in the fire water loop. **LANS:** ENGINEERING to provide at 100% to reflect As-built.(7/1/15) **90% DSA Verification: Issue not resolved.**
25	HSS-Verification (PDSA 1.0)	6	2-28	2.6.4.1	**Issue:** The PDSA describes the exterior walls of the WSBs and the CWSB, but it is not clear that these walls will be designed to meet the requirements of a 1-hr fire rated wall. The permanent equivalency (ref. LANL-DOE-ORDER-420.1B-EQ-2011-002) is based on several Equivalent Conditions and Supporting Actions. One of these actions is that the exterior walls be constructed with fully compliant UL- listed/FM approved one hour rated exterior walls. The Life	**LANS** - This is now section 2.6.5.3 of the approved PDSA R3.1 discusses the fire rated walls in the context of the Equivalency for the separation distance between WSBs. Table 4-2 reflects the design criteria per equivalency. Table 4-2 of the approved PDSA R3.1 reflects the design criteria of the 1-hr rated wall per equivalency. Section 4.3.4.4 reflects a "non-combustible Class A" roof.

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					Safety drawing (ref. C55904) currently only shows a 1-hr rated wall around the sprinkler riser room. Furthermore, the permanent equivalency states that the roof will be designated as Class A. However the Storage Building Separation calculation (ref. 11-001-CCAL-001) states that it can be either Class A or non-combustible. **Action:** Ensure the conditions that supported the approved Permanent Equivalency are consistent with the PDSA. (JLR)	**December 2014 Verification:** *Partially implemented.* The draft DSA reflects the discussion above – with a new section 4.3.4 requiring the Class A roof. The response does not address the drawing discrepancy. **LANS:** ENGINEERING to provide at 100% to reflect As-built.(7/1/15) **90% DSA Verification: Issue not resolved.**
26	HSS-Verification (PDSA 1.0)	53	4-44	Table 4-15	**Issue:** The functional requirements and design criteria for the enclosures housing the isolation fuse device, seismic switch and contactor are not included in the table. The critical characteristics determinations and technical evaluation and acceptance plans for the devices, and the equipment specification address the outdoor installation of the equipment and the ensuing environment (including NEMA 4 qualification and testing at temperature extremes), but do not fully address critical characteristics to deal with potential adverse intrusions to the enclosure from dust or moisture, for example. See also the FMEA. **Action:** Include the important functional requirements and design criteria for the SPCS components in the table. (DJO)	**LANS -Deferred to 90% DSA submittal;** ENGINEERING to provide information. **December 2014 Verification:** *Partially implemented.* The need for weather tight electrical enclosures for the SPCS components outside is identified in Table 4-13, but the performance and design criteria remain to be determined by Engineering. **LANS:** ENGINEERING to provide at 100% to reflect As-built.(7/1/15) **90% DSA Verification: Issue not resolved.**

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ATTACHMENT 2 - EA Review New Comments

DSA-TWF-001, Documented Safety Analysis for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

TSR-TWF-002, Technical Safety Requirements for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

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1		2-13	2.4.6	**Issue:** The dimensions for the Calibration Source Storage Building are not specified as required by DOE-STD-3009-94, section 2.4. Building dimensions are used as input to χ/Q determination in MACCS2 and other dispersion computer codes. **Action:** Revise the DSA to include the dimensions of the Calibration Source Storage Building.	R	JW	**LANS:** **Verification:**
2		2-13	2.4.6	**Issue:** The description of the Calibration Source Storage Building mentions "*matrix containers*," but does not discuss a "*safe*" as in §2.5.3.6, *Calibration Sources*. Matrix containers are not described in this section. The only description in §2.4.6 is that they have "*wells*" in which to place sealed sources. A description of "*matrix container*" and "*safe*" needs to be provided to understand if there are any hazards associated with sealed source storage in them. Failure to properly describe storage methods can lead to incomplete hazards evaluation and potentially inadequate controls. **Action:** Provide a complete description of how sealed sources are stored in the Calibration Source Storage Building.	R	RRH	**LANS:** **Verification:**
3		2-23 ff.	2.5.4	**Issue:** Figure 2-15 depicts two occasions for overpacking containers, but the discussion in the section does not address under what conditions a container might be overpacked at the facility, the location of the overpack activity, or the general process involved in assembling an overpack. Consequently, the overpack activities may not be fully analyzed and included in the activities allowed by the safety basis approval. In addition, hazards and controls may be overlooked. **Action:** Revise the appropriate sections to address the anticipated overpack activities and verify that the hazard analyses fully address the anticipated activities.	R	DJO	**LANS:** **Verification:**
4		2-40	2.9.2	**Issue:** The alarm signals for the SS fire water tank, utility building, riser rooms and the diesel generator are not considered safety significant. This approach appears to be non-conservative and not consistent with DOE-STD-3009, Section 4.4.x.2, for safety support systems. This approach is also not	R	JLR	**LANS:** **Verification:**

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DSA-TWF-001, Documented Safety Analysis for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

TSR-TWF-002, Technical Safety Requirements for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

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				consistent with the recently issued Fire Hazards Analysis (revision 6, 7/15) that includes a designated Safety Significant (SS) fire alarm control panel. Failure to identify, classify and implement controls could lead to inadequate control set. **Action:** Revise the DSA and designate the alarms as SS.			
5		3-6 4-27 4-29	3.3.1.2.1 4.3.7 Table 4-16	**Issue:** This section, *Inputs and Assumptions*, discusses TRU Waste containers but does not include a basic assumption of the Criticality Safety Evaluation (i.e. NCS-TECH-15-0010 July 2015 DRAFT); namely, that the TRU Waste containers are made of steel. The draft CSE indicates that analysis of containers in arrays remain subcritical as long as one of three assumptions is met, steel containers being one of them. In evaluating over mass events, the drum steel takes on greater importance. This assumption is not protected as a control in Chapter 4 or in the TSRs. Failure to protect analytical assumptions can lead to a potentially inadequate set of controls. **Action:** Add the requirement that the TRU Waste containers be made of steel.	R	RRH	**LANS:** **Verification:**
6		3-7 ff. 4-61	3.3.1.2.1 4.5.1.2 4.5.1.4	**Issue:** The section on initial conditions states that a base assumption is that the hazardous waste received at TWF meets the WIPP WAC, but there is no analysis of the need for controls for this initial condition and there is no specific TSR control protecting this assumption. The assumption that the waste meets the WIPP WAC requirements supports the entire hazard and accident analysis. When containers arrive at the TWF, the generator's certification is the only control on waste container content and this action is not protected in the TSRs. Failure to properly analyze and protect initial conditions could lead to an inadequate set of hazard controls. **Action:** Evaluate the initial condition associated with meeting the WIPP WAC and identify the controls necessary to protect this initial condition.	R	RRH	**LANS:** **Verification:**
7		3-7 3-19	3.3.1.2.1 Table 3-6	**Issue:** Second bullet on DSA page 3-7 provides that the MAR in the CT, Shipping and Receiving Area, and the Waste Storage Area is in a transient condition and is considered part of the WSB MAR. Table 3-6 provides "TWF Area Inventory" as 2,640 EC PE-Ci for 5-WSBs/1-CWSB, 640 PE-Ci for the	R	KEB	**LANS:** **Verification:**

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TSR-TWF-002, Technical Safety Requirements for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

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				CSSB, 300 EC PE-Ci for the CT, and 1,240 EC PE-Ci for the Shipping and Receiving Area. It would appear that the limits are independent amounts for each area. The table is inconsistent with other sections of the DSA that MAR in the CT and CSSB is considered as part of the MAR of the WSB/CSSB with a Site limit of 16,480. Incorrect or inconsistent representation of MAR values may lead to inappropriate consequence evaluations and potentially inadequate MAR controls. **Action:** Provide indication on Table 3-6 that the MAR limits provided for CT and CSSB are included with the WSB/CWSB limits.			
8		3-9	Table 3-2	**Issue:** Table 3-2 identifies high energy events (category 2) as flammable gas explosions, chemical explosions, overpressures, etc. and loss of confinement events (category 3) as "*breach of confinements within the facility boundary*," but no energetic events or chemical explosions are analyzed in the DSA. Table 3A-3, *Hazardous Material Identification*, identifies "*incompatible chemicals*" for TRU Waste container contents as event 2-010, this event is not included in the hazard evaluation tables. In February 2014 an accident occurred at WIPP in which a LANL TRU Waste drum was breached as a result of an exothermic reaction involving the mixture of organic materials and nitrate salts (i.e. OE-2: 2015-1 *Evaluation of Nitrate-Bearing Transuranic Waste Streams* June 2015). This resulted in an energetic release of TRU waste from the drum. This event has the potential for high consequences to a FW. Depending on the radiological content and the severity of the energetic reaction, this event could also have high consequences to the CLW. The TWF DSA does not identify or analyze this hazard and its potential consequences. Failure to analyze all significant hazardous events could lead to missing controls to protect the facility and co-located worker. **Action:** Add this event scenario to the DSA analysis.	R	RRH	**LANS:** **Verification:**
9		3-16 3-35	3.4 Table 3-4	**Issue:** The DSA inaccurately quotes direction received from NNSA in letter 10355-L09_00002, SBT: 25JT-38592, dated August 04, 2009, *Concurrence with Approach on the Application of DOE-STD-1189 with DOE-STD-5506 for TRU Waste Facility Projects*. Specifically, the DSA states, "*The direction*	R	JW	**LANS:** **Verification:**

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				stated that doses between 1 and 5 Rem for the MEOI are considered moderate consequences. However, it is possible to provide justification that an SSC credited to prevent or mitigate an event with radiological doses exceeding 5 Rem, but not exceeding 10 Rem, is Safety Significant (SS).” This is inaccurate since the NNSA letter states “*SC Controls shall be considered for unmitigated public dose exceeding 5 Rem in accordance with DOE-STD-1189 guidance. Per the Standard, the rationale for the decision to classify an SSC as SC or not should be explained and justified. The guidance presented in Section 6.3 of DOE-STD-5506 may be considered when justifying safety classification decisions*.” The letter does not state that exposures between 1 and 5 Rem to the public is considered moderate. Neither the NNSA letter nor DOE-STD-5506, Section 6.3 provided any interpretative direction to consider controls for the MEOI between 5 Rem and 10 Rem as Safety Significant. Additionally, the DSA section 3.4 states, “*These statements imply that potential offsite dose consequences between 5 Rem and 10 Rem may be justified as sufficiently mitigated such that further Safety Class controls are not necessary.*” This is contrary to DOE-STD-5506, Section 6.3, and NNSA letter which stated, “*However, it would be appropriate to consider the conservatisms in the source term and consequence analysis factors, as discussed in Section 6.3 of DOE STD 5506, in determining the need for SC designation for unmitigated public doses exceeding 5 Rem*.” Leaving this error in the DSA can adversely impact USQ determinations. **Action:** Revise the DSA to accurately reflect the guidance and basis for determining controls for MEOI exposure between 5 Rem and 10 Rem provided in NNSA letter.			
10		3-20	3.3.2.1.1	**Issue:** The MAR Inventory Control does not establish limits for fissile gram equivalent (FGE). The FGE limits protect the assumption used to perform the criticality analysis. The MAR is expressed in PE-Ci, but not FGE, which are both specified in the WIPP WAC. The MAR Inventory Control (an initial condition) establishes MAR limits based on WIPP WAC payload limits; therefore, the FGE limits need to be included with this control. Failure to	R	RRH	**LANS:** **Verification:**

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TSR-TWF-002, Technical Safety Requirements for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

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				fully establish controls to preserve initial conditions and assumptions can lead to an inadequate control set. **Action:** Include FGE limits in the MAR Inventory Control.			
11		3-25 5-6	Table 3-8 5.5.1	**Issue:** The DSA does not fully define ISI inspection requirements for design feature (DF) verification. These inspections meet the DOE-STD-3009 requirements specified for DSA, Chapter 5; specifically, these are inspections required to maintain operability of the facility's design features. DF verification requirements (e.g. inspection of standing seam roofs (6.2.1.1) and exterior walls (6.2.2.1)) need to be identified in the DF section of Chapter 5. Failure to include appropriate inspections for DFs could lead to degradation and failure of the design feature. **Action:** Revise the DSA to list the recurring ISI for those DFs.	R	JW	**LANS:** **Verification:**
12		3-27 3-27 5-25	3.3.2.3.2.3 Table 3-10 5.5.2.13	**Issue:** The Lightning Protection System is designated as DID for several hazard events; however, there are no controls (similar to those in DSA Section 5.5.2.4 and TSR Section 5.8.4) established to ensure this system is being inspected, maintained and tested (i.e., verify continuity, ground resistance, etc.). Failure to identify and implement maintenance activities related to the reliability of equipment important to safety could lead to reduced reliability and higher safety risk from lightning hazards. **Action:** Revise the DSA Section 5.5.2.13 (and TSR Section 5.8.13) to identify appropriate controls to ensure the safety functions for the lightning protection system are maintained in accordance with minimum standards (i.e., NFPA 780).	R	JLR	**LANS:** **Verification:**
13		3-27 3-23	3.3.2.3.3 3.3.2.3.2.1	**Issue:** Neither this section nor the referenced section and table of safety significant controls identify the controls related to deflagration hazards (e.g., venting the container, resistance to mechanical stress, and container loading) that serve to prevent or mitigate this event. This could lead to failure to identify a hazard control that is important to worker safety. (See also comment on Event TWF-2-001.)	R	DJO	**LANS:** **Verification:**

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DSA-TWF-001, Documented Safety Analysis for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

TSR-TWF-002, Technical Safety Requirements for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

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				Action: Revise the worker safety section to address the full set of controls related to this event.			
14		3-38	Table 3-14	**Issue:** This table depicts Container DR values for consequence evaluation. The value for the POC in several different types of accident stresses is listed as "0.0." A recent letter from NNSA, stated: *"NA-50 believes that, despite being an approved Technical Standard, DOE Standard 5506 should no longer be used to justify applying a DR of zero to POCs for fire scenarios*." NNSA has determined that crediting POCs with a damage ratio of zero as "*inappropriate*" and "*not technically defensible*." Failure to conservatively estimate factors in the source term can lead to an invalid analysis and inadequate controls. **Action:** Provide a technically defensible DR for use with POCs.	R	RRH	**LANS:** **Verification:**
15		3-44	3.4.1.3	**Issue:** TWF DSA application of χ/Q may be non-conservative since it's based on NNSA letter, SBT:25JT-38592, *Concurrence with Approach on the Application of DOE-STD-1189 with DOE-STD-5506 for TRU Waste Facility Projects,* dated August 9, 2009, (i.e. use DOE-STD-1189's value of χ/Q in calculating CLW dose). With the 2015 issuance of Operating Experience, OE-3: 2015-02, and NSRD-2015-TD01, new criteria have been established specifically for facilities smaller than the default facility size (10 meters tall by 36 meters wide). Since TWF facility structures are significantly smaller than these dimensions, the August 2009 direction to use the DOE-STD-1189 value of 3.5E-3 s/m^3 needs to be evaluated to determine if this value provides a conservative estimate of dispersion. **Action:** Using the latest guidance for atmospheric dispersion parameters issued in OE-3: 2015-02 and NSRD-2015-TD01, determine if the use of the DOE-STD-1189 χ/Q value provides adequate conservatism for the calculation of collocated worker exposures.	R	JW	**LANS:** **Verification:**
16		3-46	3.4.2.1.1	**Issue:** The scenario development for DBA 1 does not provide a description of fire magnitude and duration. This is important as some of the initial condition controls are dependent on the duration of the fire, (e.g., POCs). In addition, the Sealed Source Fire-rated Containers are required to meet a 60 minute fire.	R	RRH	**LANS:** **Verification:**

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				Failure to properly describe the hazardous event and protect the initial conditions/assumptions can lead to an invalid analysis. **Action:** Provide the description for the heat release rate (intensity) and duration of the fire.			
17		3-47	3.4.2.1.1	**Issue:** The *Scenario Development* paragraph references a study (Maybee 1995, *DOE On Fire*) to establish the likelihood of a single building fire. The reference is not added to the list of Chapter 3 references. There is no discussion of what assumptions the reference used, how the facilities evaluated in it are similar to those of the TWF, and why its values are justified for use for a TWF fire event. Failure to use appropriate references for analytical assumptions and verify their applicability to the analyzed facility can lead to invalid analysis. **Action:** Provide the justification for how the values in this report are valid for the TWF large fire DBA.	R	RRH	**LANS:** **Verification:**
18		3-47	3.4.2.1.1/2/1	**Issue:** The discussion of the scenarios makes it clear (as demonstrated in the supporting calculation) that the flammability rating of the exterior walls and the distance between the buildings are inextricably tied, but the control only identifies the distance between characterization trailers as safety class. While it is recognized that the distance between structures will be established during construction (and could be considered an initial condition), the separation distance between buildings is nevertheless safety class, should be identified as a passive design feature (like other features established during construction), and protected by the configuration control program (at a minimum). Failure to accurately identify controls can lead to operating the facility outside the safety basis. **Action:** Revise the DSA and TSR to identify the separation distance as a safety class passive design feature.	R	DJO	**LANS:** **Verification:**
19		3-48 3-50	Table 3-18 3.4.2.1.4	**Issue:** Use of fire-rated containers for sealed sources is cited as a control for an initial condition with the assumption they survive fire conditions. The description indicates the containers can withstand the ASTM E119-14 time-	R	RRH	**LANS:**

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		4-36	4.3.9.3/4.3.9.4	temperature curve for 60 minutes, but there is no description or reference provided on their design or materials of construction. The Chapter 4 discussion (functional requirements and system evaluation) also does not provide an adequate description. Failure to provide an adequate description of a DF can lead to an inadequate control. **Action:** Provide the proper reference for the design and materials of construction for the fire-rated container.			**Verification:**
20		3-67	Table 3-37	**Issue:** ARF x RF for "25% of containers lift lids and 1/3 of material ejects, which flexes in air" is provided as 1E-3. Correct number is 1E-4. Incorrect ARF x RF values may lead to incorrect determination of Source Term (ST) and corresponding evaluation of required controls. **Action:** Correct ARF x RF value for said containers to 1E-4.	S	KEB	**LANS:** **Verification:**
21		3-70	3.4.2.4	**Issue:** This DBA does not demonstrate conformance to DOE's hierarchy of controls. TWF-1-014 (DBA No. 4) involves a vehicle collision with TRU waste containers in the Shipping and Receiving Area, a fuel leak, and resulting fuel pool fire. Section 3.4.2.4.4 states that there are no engineered controls to completely preclude the presence of a fueled vehicle in the Shipping and Receiving Area and proposes the use of a SAC that restricts fueled vehicles in the area during MAR handling operations. A hydraulic wedge barrier would be an active engineered SSC that would prevent collision between an off-site vehicle and MAR in the Shipping and Receiving Area. Given the preference for engineered controls over administrative controls per DOE-STD-3009, no discussion or explanation for selection of the SAC over an active SSC is provided. **Action:** Include an active wedge barrier as a SC SSC to preclude the presence of fueled vehicles in the Shipping and Receiving Area during MAR handling operations.	R	KEB	**LANS:** **Verification:**
22		3-75	Table 3-44	**Issue:** Source terms (ST) calculated for affected material that subsequently burns unconfined is incorrectly provided as 29.21E-1 PE-Ci. The correct	S	KEB	**LANS:**

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				number should be 9.21E-1 PE-Ci. Incorrect calculation of source term values may lead to incorrect determination of required controls. **Action:** Correct source term value determined for ejected material that burns unconfined to 0.921 PE-Ci.			**Verification:**
23		3-76 4-74 5-15 5-17	3.4.2.4.5 Table 4-39 5.5.1.6 5.5.1.7	**Issue:** The controls discussion for DBA 4 (Unique vehicle collision with TRU Waste Containers in the Shipping and Receiving Area) did not identify any requirements for non-combustible hydraulic fluid. However, the SAC evaluation for the Fueled Vehicle Restriction indicated that only Electric Forklifts with non-combustible hydraulic fluid are allowed in the shipping and receiving area when handling MAR. The evaluation is written as if the non-combustible hydraulic fluid is a requirement for the electric forklift. No initial conditions or assumptions identify this as a requirement in the hazard/accident analysis despite the LCO controls indicating it as such. Failure to identify & protect analytical assumptions can lead to an incomplete control set. **Action:** Define the assumption in the hazard/accident analysis and protect it appropriately as a control.	R	RRH	**LANS:** **Verification:**
24		3-91 4-35 4-36	3.4.2.6.5 4.3.9.1 4.3.9.3	**Issue:** The stated safety function for the Fire-rated Containers for Sealed Sources is not internally consistent in the DSA. The stated safety function in Table 3-57 is: *"This control limits the impact of fires on Sealed Sources to just the MAR not in Fire-rated Containers*." The DSA initial condition (pg. 3-47) indicates they are designed in such a way as to preclude their contents from being released by the accident phenomena. Similarly, HEs #TWF-1-006b, -006c, -007, -012, -025a, -025b, and TWF-7-008 all describe its preventive function as: *"{IC} Sealed Sources in Fire-rated Containers (Provide primary confinement of potentially dispersible radioactive material limits by maintaining sealed source confinement by resisting internal pressure buildup and internal heating.)"* Failure to properly state the SSC safety function can lead to an inadequate control. **Action:** Revise the safety function for the Fire-related Containers for Sealed Sources to be consistent with the initial condition and hazard event records.	R	RRH	**LANS:** **Verification:**

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25		3-98	3.4.2.7	**Issue:** DBA 7 is an onsite vehicle impact with MAR (TWF-3-018). a. The *Scenario Development* section postulates a vehicle collision but does not describe the size/weight of the vehicle. Without physical attributes with respect to the vehicle, it is difficult to assess the consequences of an impact with TRU Waste drums. Failure to adequately describe the event scenario can lead to an inadequate control set. b. The initial conditions paragraph discusses TRU waste container response in a fire. That is not pertinent to this DBA which involves a mechanical impact to waste drums. This discussion should be removed from this section. **Action:** a. Provide the vehicular description to include size and weight of the vehicle. b. Remove the discussion of TRU Waste container response in a fire.	R	RRH	**LANS:** **Verification:**
26		3-103	3.4.3	**Issue:** Operating Experience 1: 2013-01, Attachment 2, provides guidance for performing an enhanced evaluation of BDBEs as part of DSA updates. While the DSA addresses some of the Attachment 2 BDBEs, it fails to address all the listed types of BDBEs (e.g., cascading design basis events) and the requirement to provide documented rationale for exclusion. Failure to fully complete this evaluation will cause the DSA to be non-compliant with the Operating Experience direction. **Action:** Fully implement OE-1: 2013-01, Attachment 2.	R	JW	**LANS:** **Verification:**
27		3A-10 3B-i	Appendix 3A-3/1/1 ff. Appendix 3B	**Issue:** For oxidizers, time-sensitive, and incompatible chemicals, the hazard identification table lists event 2-010 as the appropriate scenario; however, Appendix 3B does not include this hazard evaluation table. Failure to analyze a scenario can lead to missing hazard controls. **Action:** Complete the analysis of these scenarios and revise the DSA and TSR as appropriate.	R	DJO	**LANS:** **Verification:**

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28		3B-40	Event TWF-2-001	**Issue:** The analysis of the event and the event record are incomplete. There is no explanation for assigning an unmitigated frequency of BEU, although the identified causes might both be postulated to occur during the life of the facility. The chemical consequences are not estimated. Other potential causes, such as improper loading of the container, are not identified. Controls on the contents of the drum that serve to prevent the event are not identified. An incomplete analysis can lead to missing hazard controls. **Action:** Reanalyze the event and revise the hazard event table to fully address the potential causes, consequences, and controls of this event.	R	DJO	**LANS:** **Verification:**
29		3B-74	TWF-5-002	**Issue:** The unmitigated event frequency is listed as BEU, yet the draft CSE indicates the initiating events are credible, although unlikely. This hazard event (breach of containers resulting in a criticality event) is not mentioned in the DSA. Without verifying the WIPP WAC, the FGE content of the waste containers could be significantly higher. DOE-STD-3007 states that "*The events identified in the hazard analysis should be those covered in CSE*" and "*all credible contingencies shall be identified, analyzed, and documented*," and "*assumptions about the process and scope limitations that impact the CSE should be stated and justified*." Failure to properly protect initial conditions and assumptions can lead to an inadequate hazards analysis. **Action:** Compare the events analyzed in the draft CSE with the DBAs and ensure the DBA content appropriately discusses each credible event	R	RRH	**LANS:** **Verification:**
30		3B-86	Event TWF-7-005	**Issue:** The Lightning Protection System (LPS) is identified as an administrative control for event TWF-7-005. It is unclear how this engineered system can function as an administrative control. Failure to fully identify and develop controls could lead to inadequate control set. **Action:** Revise the DSA to reflect the appropriate control for the LPS.	R	JLR	**LANS:** **Verification:**
31		4-12	Table 4-5	**Issue:** The performance criteria for the WSB non-combustible exterior wall is identified as a type of wall panel (i.e., insulated core metal) and listing (i.e. FM approved class 1) which is difficult to assess or measure. An alternative would be to identify the required fire resistance of 1 hour as the performance criteria	R	JLR	**LANS:** **Verification:**

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				more clearly aligning with the functional requirement for limiting the spread of fire between individual WSBs/CSWB. Failure to fully address and evaluate the performance criteria could lead to an inadequate control. **Action:** Revise the DSA accordingly.			
32		4-25	4.3.6.3 Table 4-13	**Issue:** Table 4-13 provides the POC functional requirements to fulfill the safety function and lists applicable DBAs. DBA No. 1 (Section 3.4.2.1), Large Fires at the TWF Site Involving Ordinary Combustibles, which references the POC as an SC control, is not included as one of the applicable Accident or Hazards. **Action:** Include DBA No. 1, Large Fires at the TWF Site Involving Ordinary Combustibles as an applicable Accident or Hazard in Table 4-13.	S	KEB	**LANS:** **Verification:**
33		4-25	Table 4-14/1/1	**Issue:** The evaluation section describes that pressure testing shows that a hydrogen deflagration would not be sufficient to damage the POC, but it does not evaluate the physical characteristics and configuration of the POC that provide physical containment and seal integrity. Failure to fully evaluate the parameters related to the primary confinement function of the containers could lead to an inadequate set of controls. **Action:** Revise the table to more fully discuss and evaluate the engineering, assembly, and administrative controls that address confinement features of the containers.	R	DJO	**LANS:** **Verification:**
34		4-26 4-29	Table 4-14 Table 4-16	**Issue:** The stated performance criteria and the associated evaluations are not sufficient to ensure that the container is protected from flammable gas buildup. The performance criteria do not specify the complete filter performance requirements (see related technical documents such as the CH TRAMPAC) and the evaluation does not address the relationship between the container contents, flammable gas generation rate, and filter flow rate capacity. In the case of the POC, the table does not address the need for two filters. Failure to fully evaluate the parameters related to preventing flammable gas buildup in the containers could lead to an inadequate set of controls.	R	DJO	**LANS:** **Verification:**

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				Action: Revise the table to more fully discuss and evaluate the engineering and administrative controls that address flammable gas buildup in the containers.			
35		4-26	Table 4-14/2/1	**Issue:** The evaluation does not address the physical characteristics and configuration of the POC that provide physical containment and seal integrity for the POC. For example, it discusses the response of the POC to a tine puncture, without discussing what properties of the POC are necessary to ensure the assumed damage ratio is met. Also, it does not discuss the physical features of the tested configurations that provide resistance to side impacts (e.g., vehicle collision) or crush (e.g., roof collapse). Failure to fully evaluate the parameters related to primary confinement function of the containers could lead to an inadequate set of controls. **Action:** Revise the table to more fully discuss and evaluate the engineering and administrative controls that address confinement features of the containers.	R	DJO	**LANS:** **Verification:**
36		4-29	Table 4-16	**Issue:** Although the TRU waste containers must be of sound integrity (Performance Criteria), this statement does not fully address the criteria necessary to meet the stated safety functions. For example, to contain waste during a fire, the drum must retain its configuration (e.g., lid intact, no damage to the drum, or moderate seal failure) for the postulated fire. Similarly, for mechanical stresses, the drum must meet the stated integrity for drops and impacts. Failure to fully identify the performance criteria for these safety class SSCs could lead to inadequate TSR controls. **Action:** Revise the performance criteria to completely describe the thermal and mechanical properties required to meet the identified safety functions.	R	DJO	**LANS:** **Verification:**

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37		4-29	Table 4-16	**Issue:** The evaluation in Table 4-16 closely follows the discussion in DOE-STD-5506; however, this discussion is relevant to "legacy drums" and does not fully address the steps to be taken to ensure that newly generated safety class TRU waste containers meet the safety functions. To meet the thermal and mechanical performance requirements, the drums must not only meet the structural requirements (type of material and construction), but must also be assembled to meet the test configurations and shipping requirements. For example, the drum closure ring must be seated, torqued, and then re-torqued if necessary to ensure proper closure. Failure to identify these requirements in the evaluation and discussion of TSR controls may lead to missing controls. **Action:** Revise the subsections to address the processes by which a new container is procured, loaded, and assembled and ensure that an adequate set of TSR controls is considered for these safety class SSCs.	R	DJO	**LANS:** **Verification:**
38		4-33	Table 4-18	**Issue:** The safety function and associated functional requirement both state that they apply during a "*seismic event that exceeds SDC-2*," but do not limit the safety function to the design basis earthquake (i.e. the SDC-3 earthquake). This could lead to confusion in interpreting the design and performance requirements of the SPCS. **Action:** Revise the entries in the table to clarify that the SPCS is designed to remove power for earthquakes between the SDC-2 earthquake (for the design of the buildings) and the SDC-3 earthquake (the design basis earthquake).	S	DJO	**LANS:** **Verification:**
39		4-34	Table 4-19/1/1	**Issue:** The evaluation section for the first performance criteria states that the "*seismic switch will survive and not fail (unsafely) during ground motion associated with the site-wide response spectra given in the LANL ESM*," but this is a criterion for the performance of the SPCS and not an evaluation of its ability to meet its safety function. Failure to fully address and evaluate the performance criteria could lead to an inadequate control. **Action:** Revise the performance criteria in the table to fully address the function of the SPCS (i.e., remove power at or below the level of the SDC-2	R	DJO	**LANS:** **Verification:**

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				earthquake and assure power remains off for earthquakes up to and including the SDC-3 earthquake).			
40		4-34	Table 4-19/1/1	**Issue:** The evaluation section does not address a number of important performance criteria associated with the SPCS; such as whether: • the tri-axial seismic sensors will be used to monitor both horizontal and vertical motion, • each axial sensor will independently generate a trip signal, • there is design margin between the design response spectrum and the peak ground acceleration used to establish the seismic sensor setpoint. Failure to fully address and evaluate the performance criteria could lead to an inadequate control. **Action:** Revise the evaluation of the performance criteria to address the technical aspects of the SPCS design that assure its ability to perform the safety function.	R	DJO	**LANS:** **Verification:**
41		4-34	Table 4-19/1/1	**Issue:** The table does not include as a performance criterion the requirement that the SPCS consist of two independent, redundant channels; each capable of performing the intended safety function. This is a key performance criterion for the system. Closely related is the requirement to be free of "single point" failures. Failure to fully address and evaluate the performance criteria could lead to an inadequate control. **Action:** Revise the performance criteria in the table to fully address the criteria necessary to achieve the safety function of the SPCS.	R	DJO	**LANS:** **Verification:**
42		4-34	Table 4-19/1/1	**Issue:** The table addresses one aspect of independence – physical separation of the two channels, which is discussed in Section 4.3.8.2, but the electrical independence of the channels from each other and from the non-safety electrical supply is not evaluated in the table. Failure to fully address and evaluate the performance criteria could lead to an inadequate control.	R	DJO	**LANS:** **Verification:**

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				Action: Revise the performance criteria and evaluations in the table to fully address the criteria necessary to achieve the safety function of the SPCS.			
43		4-34	Table 4-19/2/1	**Issue:** The second performance criterion identifies the need to disengage site power when a seismic sensor problem is detected. The evaluation section does not address the software (and firmware) processes that will be used to monitor the seismic sensors (e.g., the monitored parameters are not identified) and generate the trouble signal. It also does not evaluate the ability of the system to meet the performance criterion. Failure to fully address and evaluate the performance criteria could lead to an inadequate control. **Action:** Revise the evaluation of the performance criteria to address the technical aspects of the SPCS design that assure its ability to perform the safety function.	R	DJO	**LANS:** **Verification:**
44		4-34 5-30	Table 4-19/3/1 5.6.8/2/1	**Issue:** The peak ground acceleration cited in the third performance criteria does not match the value identified in DSA Table 1-3 or the reference for the seismic hazard curves. Use of an incorrect seismic hazard curve could result in an inadequate design. **Action:** Verify the correct peak ground acceleration curve and seismic hazard curves and revise the DSA to reference the correct value(s).	R	DJO	**LANS:** **Verification:**
45		4-34	Table 4-19/3/1	**Issue:** The third criterion does not address the performance criteria for the SPCS foundation pad that ensures it provides coupling between the seismic sensors and the ground motion. Failure to fully address and evaluate the performance criteria could lead to an inadequate control. (Note that plans are to undo the sensor mount monthly in order to perform a functional test.) **Action:** Revise the performance criteria in the table to fully address the criteria necessary to achieve the safety function of the SPCS foundation.	R	DJO	**LANS:** **Verification:**
46		4-38	4.4.1.2	**Issue:** The DSA does not explicitly describe the pressure boundary conditions for the FSS and the interface to supporting systems including the nitrogen system and non-safety water supply. For example, isolating valve (ref. GV-006) is shown on the Site Utilities Fire Protection P&ID (ref. C55443 C-6000)	R	JLR	**LANS:** **Verification:**

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				as safety significant in the normally open position. This is contrary to SR 4.2.1.4 requiring a monthly surveillance to ensure this valve is locked in the closed position. Failure to fully identify and develop controls could lead to an inadequate control. **Action:** Revise the DSA to describe the SSC's necessary to maintain the SS boundary for the FSS.			
47		4-39 4-47	Table 4-23 Table 4-25	**Issue:** Table 4.25, in several locations, cites hose stream requirement of 500 gpm from DOE-STD-1066-2012, which is more restrictive than the NFPA requirement. The project has not adopted STD-1066-2012, however this more restrictive requirement appears in the LANL Engineering Standards Manual Section D4010, Para 2.M. **Action:** Consider revising the hose stream reference to the LANL Engineering Standards Manual.	S	JJP	**LANS:** **Verification:**
48		4-40, 4-41, 4-43, & 4-45	Table 4-23	**Issue:** The credited controls do not fully demonstrate conformance to DOE's hierarchy of controls. For example, the description of the Fire Water Tank indicates the fire water tank low level alarm signal is not required to support the safety function of the FSS. Instead, an administrative check by facility personnel will be used to record tank level and ensure the availability of sufficient water for fire-fighting. Designating an administrative control vice an engineered feature to monitor fire suppression system conditions does not meet the STD-3009 established hierarchy of hazard controls and needs to be justified in the description. The same deficiency exists for the mechanical room temperature alarm signal, the riser room temperature alarm signal, the N2 pressure alarm signal, and the diesel generator alarm signals. Failure to rely on engineered over administrative controls to monitor SSC conditions can result in an inadequate control set. **Action:** Designate the engineered feature (low level alarm/temperature alarms/N2 pressure alarm) as the primary control.	R	RRH	**LANS:** **Verification:**

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No.		Page	Section/Para/ Line	Reviewer Comment	R/S	Rev.	Resolution
49		4-43	Table 4-23	**Issue:** The DSA indicates that the nitrogen system has no safety function, but this statement is not accurate since there is equipment (i.e. pressure maintenance device) located on the system side of the nitrogen system that could fail adversely impacting the FSS. In addition, there are no controls on the maximum flow from the nitrogen system regulator to ensure that once a sprinkler is actuated the regulator does not maintain the system at 20-30 psig. Table 4-23 states that the nitrogen system has insufficient flow to keep up with an activated sprinkler head. Once the system depressurizes, the dry standpipe clapper valve would open to allow fire water flow. An oversized regulator could allow enough flow to maintain the clapper valve closed with an open sprinkler head, preventing fire water flow. Failure to implement a control could result in an inoperable FSS. **Action:** Provide a control on the maximum allowable flow through the nitrogen system to ensure that the system will not maintain system pressure after actuation of a sprinkler head.	R	KEB	**LANS:** **Verification:**
50		4-43 4-46 4-51 TSR 3/4-8, Bases-23	Table 4-23 Table 4-23 Table 4-25 TSR LCO 3.2.2, B3/4.2 (Bases section 3.2.2)	**Issue:** The component performance requirement for the nitrogen system relief valve has not been sufficiently analyzed. Table 4-23, *Fire Suppression System Component Descriptions*, provides limits on the nitrogen supply pressure to both prevent damage to the FSS due to overpressure (limit 175 psig) and to prevent affecting the system response time in the event of a fire (limit 30 psig, p. 4-43 and Bases-23). As a result, the pressure relief device associated with the nitrogen system is designated "SS" to prevent over-pressurization of the FSS. The performance criteria for the FSS relief valve (Table 4-25, p. 4-51) and LCO 3.2.2 state the relief valve is only to limit the pressure below 175 psig to prevent damage to the system. Unclear or inconsistent specification of design requirements could lead to incorrect LCO or surveillance specifications. **Action:** Clarify whether the function of the nitrogen system relief device is to prevent exceeding 30 psig or 175 psig (Table 4-23). Update LCO and surveillance requirements as necessary.	R	KEB	**LANS:** **Verification:**

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No.		Page	Section/Para/ Line	Reviewer Comment	R/S	Rev.	Resolution
51		4-44 4-55	Table 4-23 Table 4-25	**Issue:** The performance criteria in Table 4-25, Item 14, does not identify all loads expected to be supported by the Diesel Generator as identified in Figure 4-12 in Table 4-23, such as the jockey pump, utility building electrical heaters, instruments that monitor safety parameters. Failure to fully identify all loads can lead to overload of the diesel generator and subsequent failure to provide power to the safety equipment. **Action:** Provide an explicit discussion and listing of all Diesel Generator safety significant loads and the required performance criteria and evaluation.	R	JJP	**LANS:** **Verification:**
52		4-46	Table 4-23	**Issue:** A TSR level control ensures that the dry pipe valve in each WSB/CWSB responds in less than 60 seconds should a fire activate a sprinkler head. The maximum time delivery for a sprinkler system designed for Ordinary Group II is 50 seconds as opposed to 60 seconds (ref NFPA 13). Failure to fully identify and develop controls could lead to an inadequate control. **Action:** Revise the DSA and TSR to include the appropriate criteria for the dry pipe sprinkler system.	R	JLR	**LANS:** **Verification:**
53		4-47	Table 4-25	**Issue:** The performance criteria specified for the fire water storage tank is that it have at least 153,000 gallons of water. The Table 4-25 evaluation references calculation 11-001-FCAL-002, Revision 2, which doesn't exist. Calculation 102355-TNKCAL-001, Revision C, states that the minimum safety significant water tank level is 174,000 gallons. The performance criteria is not supported by available references and is undersized for its safety function. **Action:** Revise the supporting performance documentation calculation 102355-TNKCAL-001, Revision C, and validate the safety significant fire water tank water volume performance criteria.	R	JJP	**LANS:** **Verification:**
54		4-50 5-9	Table 4-25 Performance Criteria #7 5.5.1.2.2.2	**Issue:** The performance criterion incorrectly identifies a requirement that the dry pipe valve opens within 60 seconds. The dry pipe valve trip test for the characterization/storage, and storage buildings is required to demonstrate that water delivery can be achieved within 60 seconds upon a loss of nitrogen	R	JJP	**LANS:** **Verification:**

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				pressure. (Refer to NFPA 13, Section 7.2.3.6.) An excessive time for water delivery can compromise the ability to prevent fire growth. **Action:** Revise the evaluation to state water delivery be achieved within 60 seconds rather than the dry pipe valve opening within 60 seconds.			
55		4-54	Table 4-25	**Issue:** Performance criteria #12 for the Utility Building does not list the FSS performance criterion for the Utility Building heaters. The heater is a safety significant support system required for freeze protection, the applicable performance criteria are: 1. Provide 40 kW heating output; 2. Maintain the temperature of the Utility Building above 32 degrees. The small diameter piping and pressure switch that provides a start signal to the fire pump on low pressure in the FSS system is especially sensitive to freezing. Although the electric heaters are backed up by the safety significant diesel generator on a loss of offsite power, a malfunction of a heater without the loss of offsite power could occur and lead to failure of the fire suppression system. **Action:** Add the performance criteria for the Utility Building electric heaters to provide at least 40 kW output and maintain the room temperature above 32 degrees.	R	JJP	**LANS:** **Verification:**
56		4-55	Table 4-23/4/1	**Issue:** The discussion of the boundaries and interfaces with the electrical distribution system is not complete. The discussion does not evaluate the ability of the normal power system (non-safety) to reliably provide power to the fire pumps. It also does not discuss the extent to which faults in the normal power system are isolated from the safety significant portions of the distribution system (i.e., faults in the non-safety section will not prevent the safety-related section from completing its safety function). The boundary between the non-safety and safety sections of the distribution is not identified and described. An incomplete description and evaluation of the boundaries and interfaces can lead to an inadequate set of controls.	R	DJO	**LANS:** **Verification:**

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No.		Page	Section/Para/ Line	Reviewer Comment	R/S	Rev.	Resolution
				Action: Expand the description and evaluation of the boundaries and interfaces between the normal power and backup power systems.			
57		4-56 5-11	Table 4-25 5.5.1.2.4.1	**Issue:** More detailed information is needed regarding the evaluation of the weekly inspection that ensures that the diesel generator coolant heater is operable when the ambient temperature is below 40 degrees. Specific engine elevated temperature requirements are necessary to determine operability. For example, NFPA 110, *Standard for Emergency and Standby Power Systems,* requires that the DG water jacket temperature as determined by the DG manufacturer be maintained. Similarly, UL-1247, *Diesel Engines for Driving Stationary Fire Pumps,* requires that the jacket coolant water be maintained at a minimum of 120 degrees. An ineffective surveillance requirement can lead to failure of the diesel generator to start when required. **Action:** Revise the table to fully discuss and evaluate the method and inspection criteria for determining operability of the DG coolant heater.	R	JJP	**LANS:** **Verification:**
58		4-59	Table 4-25	**Issue:** The DSA states that, "*the FSS is a seismically-qualified system (SDC-2)*" however it is unclear where the boundaries for seismic qualified SSC's occur for the dry pipe sprinkler systems and the interface with the nitrogen supply system. Failure to identify and develop controls could lead to an inadequate control set. **Action:** Revise the DSA to include information describing the boundaries for the FSS and support systems as related to seismic qualifications.	R	JLR	**LANS:** **Verification:**
59		4-70 & TSR 3/4-20	4.5.3.5 & TSR 4.5.1	**Issue:** There are inconsistent surveillance requirements for the *TSR Controls* for the Outdoor Combustible Loading and Flammable Material Control SAC. The control statement indicates the space between and around individual Waste Storage Buildings, the Characterization Waste Storage Building, The Characterization Trailers, and the Calibration Source Storage Building will be checked for combustible and flammable materials daily to ensure compliance. LCO 3.5.1 has a weekly surveillance requirement. Failure to develop DSA controls properly can result in inadequate control.	R	RRH	**LANS:** **Verification**

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No.		Page	Section/Para/ Line	Reviewer Comment	R/S	Rev.	Resolution
				Action: Correct the discrepancy between the LCO SR and the Chapter 4 TSR Control description.			
60		4-72 & TSR 3/4-22	4.5.4.4 & TSR 3.6.1	**Issue:** The SAC evaluation is inconsistent with the LCO requirement. The SAC Evaluation for the Fueled Vehicle Prohibition in the Waste Storage Area control identifies the performance criteria (PC) as "*no fueled vehicles shall enter the waste storage area during normal operations*." The FR is to "*prevent fueled vehicles or equipment from entering the waste storage area*". The FR does not restrict the control to only normal operations. Similarly, LCO 3.6.1 does not allow fueled vehicles in the waste storage area. There are no exceptions for "normal operations." DOE-STD-3009 states that the PC are imposed on the SAC so it can meet the FRs and thereby satisfy the safety function. Failure to develop DSA controls properly can result in inadequate control. **Action:** Resolve the inconsistency between the PC statement in Table 4-37 and the SR for LCO 3.6.1.	R	RRH	**LANS:** **Verification**
61		4-78 5-20	4.5.7.2 5.5.1.9	**Issue:** The DSA does not provide technical basis for allowing vegetation to grow to a maximum height of 12 inches in the 75 foot wildfire defensible zone. NFPA 1144, Standard for Reducing Structure Ignition Hazards From Wild-land Fire, Chapter 6, Fuel Modification Area, paragraph 6.2.1 states "*Ground fuels, including native vegetation and plants used for landscaping within the defined landscaping zones, shall be treated or removed.*" Inadequate control of vegetation can lead to uncontrolled spread of wild-land fire across the defensible zone and into the TWF. **Action:** Revise DSA to include technical basis for allowing the presence of native vegetation in lieu of NFPA requirements.	R	JW	**LANS:** **Verification:**
62		4-80	4.6	**Issue:** The DSA and TSR reference an outdated version of the Fire Hazards Analysis. The recently approved FHA (Rev.6 – 7/9/15) has not been incorporated into the DSA and TSR's including supporting engineering analysis and conclusions. Failure to utilize current approved analysis could lead to inadequate control set.	R	JLR	**LANS:** **Verification:**

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No.		Page	Section/Para/ Line	Reviewer Comment	R/S	Rev.	Resolution
				Action: Revise the applicable sections in the DSA and TSR's to include the updated version of the FHA.			
63		5-5	5.5	**Issue:** This section does not address controls to ensure that containers received at TWF meet the WIPP WAC (either for contents or physical configuration of the containers). Compliance with the WIPP WAC is a fundamental assumption and control related to the analysis of events and accidents at the facility (for example, see Sections 2.5.2.2, 2.7.8.2, 3.3.1.1.2, 3.3.2.1.2, and 6.4.2). Failure to identify and implement controls for the initial conditions and assumptions in the hazard and accident analysis could lead to inadequate control set. **Action:** Expand the section incorporate the controls necessary to protect the initial conditions and assumptions associated with the WIPP WAC.	R	DJO	**LANS:** **Verification:**
64		5-7	5.5.1.2	**Issue:** The FSS is described as being designed to "suppress" a fire. This statement can be misleading since the FSS and supporting sprinkler system design is based on a standard spray sprinkler head with a nominal K-factor as opposed to a suppression mode style head. **Action:** Consider revising the DSA to reflect the design attribute of the sprinkler system to "control" rather than "suppress" a fire.	S	JLR	**LANS:** **Verification:**
65		5-9 TSR 3/4-8 and 9	5.5.1.2.2.2 TSR 3/4 2.2	**Issue:** The surveillance requirement is unclear. LCO 3.2.2.4 requires that the nitrogen pressure relief device limits the dry pipe system pressure to less than 175 psig to protect system components, which implies testing the relief device setpoint and verifying the supporting calculation remains valid. The associated surveillance (SR 4.2.2.4) requires verification that the nitrogen pressure relief device limits system pressure to less than or equal to 175 psig. B3/4.2 states that the surveillance is met by either testing of the existing relief device or its replacement. Unclear or inadequate surveillance specifications could lead to system inoperability and violation of TSR requirements.	R	KEB	**LANS:** **Verification:**

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No.		Page	Section/Para/ Line	Reviewer Comment	R/S	Rev.	Resolution
				Action: Restate the surveillance requirement (for example, "Verify the dry pipe nitrogen pressure relief device has been tested or replaced and that the maximum pressure at relief is less than or equal to 175 psig.").			
66		5-14	5.5.1.5	**Issue:** The Outdoor Combustible Loading and Flammable Material Control (LCO 3.5) is credited to reduce the likelihood of a fire involving MAR that is being loaded or unloaded in the Waste Storage Area and Shipping and Receiving area. It is not clear does how this control acknowledges the access requirements for emergency vehicles in the event of a fire within the Waste Storage Area. Failure to identify all conditions that can impact the LCO could lead to an inadequate control. **Action:** Revise the DSA to ensure staging of drums within the Waste Storage Area does not conflict with access requirements for emergency vehicles.	R	JLR	**LANS:** **Verification:**
67		5-14 5-17	5.5.1.6 5.5.1.7	**Issue:** The DSA in its derivation of TSR, Chapter 5 for LCO 3.6 and 3.7 "excludes" emergency and security vehicles from fueled vehicles restrictions, but this exclusion is not supported by the hazard and accident analysis. The basis of this exclusion is stated, "*because of their necessity to respond to abnormal conditions*." DOE-STD-3009, Chapter 3, requires that hazard analysis evaluate the complete spectrum of accidents that may occur due to facility operations, which includes "abnormal conditions". Failure to analyze the excluded condition could lead to an unanalyzed hazard to the workers and the public. **Action:** Revise the DSA to evaluate the presence of emergency and security fueled vehicles in the Shipping and Receiving and Waste Storage Areas.	R	JW	**LANS:** **Verification:**
68		5-33	5.7/2/1	**Issue:** This paragraph discusses the interface with other facilities that provide waste to the TWF and the use of the WIPP WAC, but it does not address any controls at either the shipping facilities or TWF to ensure that containers received at TWF meet the WIPP WAC (either for contents or physical configuration of the containers). Compliance with the WIPP WAC is a fundamental assumption and control related to the analysis of events and accidents at the facility (for example, see Sections 2.5.2.2, 2.7.8.2, 3.3.1.1.2, 3.3.2.1.2, and 6.4.2). Failure to identify and implement controls for the initial	R	DJO	**LANS:** **Verification:**

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				conditions and assumptions in the hazard and accident analysis could lead to operating the facility outside the safety basis. **Action:** Expand the section to more fully discuss the interfaces with other facilities and the controls necessary to protect the initial conditions and assumptions associated with the WIPP WAC.			
69		6-4	6.4.3	**Issue:** Contrary to DOE-STD-3009, chapter 6 this section does not address how double contingency principle is met by TWF design and operations. The method of meeting the double contingency principle is not described, but referenced to SD130. The purpose of SD130 is: "*provides a program description and defines the requirements, roles, responsibilities, authorities, and accountability of the NCSP for facilities and activities involving a significant quantity of fissionable materials at the Laboratory*." SD130 states that LANL operations are to comply with the Double Contingency Principle but doesn't describe how the programs meet it. The DOE-STD-3009 requirement is to summarize, in this section, the methods used to ensure that at least more than one unlikely, independent, and concurrent change in process conditions is necessary before a criticality accident is possible. Failure to describe how the process design incorporates sufficient factors of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible could result in an inadequate control set. **Action:** Provide the summary of ensuring double contingency in TWF fissile material operations.	R	RRH	**LANS:** **Verification:**
70		7-1 ff. 3A-14	7.1 ff Table 3A-4/V.B/2	**Issue:** The description of the ionizing radiation hazards from the equipment in the characterization tables is incomplete and does not demonstrate that facility workers will be protected from these hazards. The hazard identification and screening process identified the radiation generating devices in the characterization trailers as potential hazards, but screened them from further consideration as standard industrial hazards. The entry in the hazard identification table does not address whether the potential high radiation doses fall under 10 CFR 835 programs, and the discussion of the radiation protection	R	DJO	**LANS:** **Verification:**

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				program in Chapter 7 does not include the key controls that should be in place to protect the workers from these hazards. Failure to address a potentially significant hazard and associated controls can lead to an incomplete understanding and implementation of the controls necessary to protect the facility's workers. **Action:** Revise Chapter 7 of the DSA to fully discuss the controls associated with both the radiation protection program and the national standard(s) for radiation generating devices that must be in place to protect the facility workers.			

EA TSR Review Comments

No.	Page	Section/Para/Line	Reviewer Comment	R/S	Rev.	Resolution
1	3/4-1 ff.	3/4.0	**Issue:** The TSR does not include controls to ensure that containers received at TWF meet the WIPP WAC. Compliance with the WIPP WAC is a fundamental assumption related to the analysis of events and accidents at the facility (for example, prevention of criticality accidents, prevention of deflagrations, prevention of high energy chemical reactions, and minimization of exposure hazardous chemicals). Failure to identify and implement controls for the initial conditions and assumptions in the hazard and accident analysis could lead to an inadequate TSR. **Action:** Incorporate the TSR controls necessary to protect the initial conditions and assumptions associated with the WIPP WAC.	R	DJO	**LANS:** **Verification:**
2	3/4-5 Bases-13	3.1.1/1/1 3.1.1/5/1	**Issue:** The LCO and associated Bases use a peak ground acceleration limit of 0.32 g, but do not discuss the use of the vertical peak ground acceleration rather than the horizontal peak ground acceleration. Without this justification,	R	DJO	**LANS:** **Verification:**

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No.	Page	Section/Para/Line	Reviewer Comment	R/S	Rev.	Resolution
			there is the potential to use a non-conservative value to set the limit on the seismic sensors. **Action:** Verify the value of the peak ground acceleration to be used in the SPCS and revise the TSR as necessary to justify the value or values used.			
3	3/4-5	3.1.1/1/1	**Issue:** The LCO does not make clear whether a channel that tripped due to a sensor trouble signal would be considered operable or inoperable. If it were operable, then the power to the waste area would remain off until the problem with the sensor was rectified and tested. But, if the sensor were inoperable, the LCO would allow continued operation for up to 30 days (though this would clearly require bypassing that channel). The LCO also does not clearly establish whether some electrical equipment could be introduced into the storage buildings to maintain temperatures above freezing during a prolonged isolation of power from the waste storage area. Without clear direction, operators may operate the facility outside the approved safety basis. **Action:** Revise the LCO and associated actions as necessary to provide direction for response actions in the case of a loss of power to the waste storage area due to a sensor trouble alarm or malfunction.	R	DJO	**LANS:** **Verification:**
4	3/4-5 Bases-13	3.1.1/1/1 Condition B 6/1/1	**Issue:** The LCO Action and the accompanying Bases do not justify why additional compensatory measures; such as stationing an operator to perform the SPCS function, are not required. In addition, the Bases uses the wrong seismic return period (i.e., 1,000 years is the correct value) as justification for the allowed duration of the condition. Lack of compensatory measures (along with an accompanying basis) for operating with loss of an engineered safety feature can lead to operation with greater risk than intended in the approved safety basis. **Action:** Evaluate whether compensatory measures are appropriate when the SPCS is inoperable and revise the TSR.	R	DJO	**LANS:** . **Verification:**
5	3/4-7 Bases-21	SR 4.2.1.3.1 B3/4.2	**Issue:** The TSR does not identify all potential obstructions that could occur from the pathway from the fire water storage tank to the PIV's. The backflow preventer could prevent flow of fire water and is required to be tested by	R	JLR	**LANS:**

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			performing a forward flow test on an annual basis. Failure to fully identify and develop controls could lead to an inadequate TSR control. **Action:** Revise the TSR and incorporate the additional (i.e. forward flow test) criteria for the surveillance requirement (ref. SR 4.2.1.3.1.)			**Verification:**
6	3/4-9 Bases-26	SR 4.2.2.1.2 B3/4.2	**Issue:** For a system where the water supply is through a backflow preventer, the main drain test of one downstream system shall be conducted on a quarterly basis (ref. NFPA 25); however, TSR SR 4.2.2.1.2 is limited to performing an annual main drain and flow test for the WSBs/CWSB. Failure to identify correct surveillance requirements could lead to an inadequate TSR control. **Action:** Revise the TSR and incorporate the correct additional surveillance requirement.	R	JLR	**LANS:** **Verification:**
7	3/4-9 Bases-26	SR 4.2.2.1.2 B3/4.2	**Issue:** The TSR SR 4.2.2.1.2 for performing a main drain and flow test does not address all required testing. This test requires identifying and correcting when there is a 10 percent reduction in full flow pressure when compared to the acceptance test or previous tests (ref. NFPA 25). Failure to fully develop and implement surveillance requirements could lead to an inadequate TSR control. **Action:** Revise the TSR and associated SR to include this testing.	R	JLR	**LANS:** **Verification:**
8	3/4-12	SR 4.2.3.3	**Issue:** The daily frequency of SR 4.2.3.3, Verification of Fire Water Pump utility room temperature to be equal to or greater than 52 degrees is non-conservative. This daily frequency infers once in a 24 hour period of time. Calculation 11-001-MCAL-013 concludes that the time required for the Mechanical Room temperature to drop from 50 to 32 degrees on a loss of power is approximately 14.7 hours. Although the electric heaters are backed up by the safety significant diesel generator on a loss of offsite power, a malfunction of a heater without the loss of offsite power could occur. The small diameter (1/2 inch) FSS pressure sensing line and pressure switch that starts the fire pump on low pressure is vulnerable to low temperature freezing conditions which can result in an inoperable FSS.	R	JJP	**LANS:** **Verification:**

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TSR-TWF-002, Technical Safety Requirements for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

No.	Page	Section/Para/Line	Reviewer Comment	R/S	Rev.	Resolution
			Action: Reevaluate the daily frequency of SR 4.2.3.3.			
9	3/4-12 Bases -35	SR 4.2.3.6 Bases 4.2.3.6	**Issue:** SR 4.2.3.6 is intended to verify annually that at least one 4.0 kW heater in the Utility Building mechanical room is operable, however there is no method identified for this surveillance to demonstrate heater operability. The heater is credited for performing a safety significant support function for freeze protection. The heater is required to provide 4.0 kW output in order to prevent freezing conditions for FSS piping in the Utility Building, which could render the FSS inoperable. **Action:** Provide a method that will verify operability of the safety significant heater. An acceptable method would be consistent with ASME N511, *In-Service Testing of Nuclear Air Treatment, Heating, Ventilating, and Air Conditioning Systems,* Section 5.6.5.7, Electric Heater Performance Test.	R	JJP	**LANS:** **Verification:**
10	3/4-14	SR 4.2.4.4	**Issue:** There is no periodic surveillance test that verifies the DG fuel consumption. The vendor's data for fuel consumption is relied upon to determine the volume of fuel oil required in the tank and there is no consideration for engine degradation over time and its impact on fuel consumption. If the engine fuel consumption has increased over time, the DG may not have sufficient fuel to meet design basis run time requirements. **Action:** Add a surveillance test to validate fuel oil consumption.	R	JJP	**LANS:** **Verification:**
11	3/4-14	SR 4.2.4.4	**Issue:** Instrument uncertainty is not included in SR 4.2.4.4.4 acceptance criteria. Calculation 11-001-ECAL-015 determines a requirement for 154 gallons and allows an additional margin for tank level instrument uncertainty that results in 170 gallons acceptance criteria. If instrument uncertainty is not addressed, the DG may not have sufficient fuel to meet design basis run time requirements. **Action:** Address instrument uncertainty in the surveillance requirement tank volume acceptance criteria.	R	JJP	**LANS:** **Verification:**

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TSR-TWF-002, Technical Safety Requirements for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

No.	Page	Section/Para/Line	Reviewer Comment	R/S	Rev.	Resolution
12	3/4-20	3.5.1	**Issue:** The Outdoor Combustible Loading and Flammable Material Control has several exceptions with respect to the complying with the LCO requirement for prohibiting storage and staging of combustible materials. These exceptions do not invoke specific limits (i.e. pounds of ordinary combustibles, standoff distances, etc.) but are dependent upon facility personnel to manage the risk of combustibles and respective quantities during an operating shift. In addition, and unlike the control for managing combustibles inside the WSB, there are no minimum standoff distances required that would eliminate small quantities of combustibles, less than the Representative Fuel Package from accumulating. Failure to fully identify limits and standoff distances could lead to an inadequate TSR control. **Action:** Revise the LCO and associated exceptions to ensure quantities of combustibles and minimum separation distances are included.	R	JLR	**LANS:** **Verification:**
13	3/4-21 Bases -61	SR 4.5.1 Bases SR 4.5.1	**Issue:** There is inconsistent DSA frequency specified for TSR SR 4.5.1. TSR SR 4.5.1 identifies a WEEKLY frequency for outdoor combustible loading and flammable material verification. However, the DSA Section 4.5.3.5 identifies these areas will be checked daily. Failure to consistently identify correct surveillance requirements in the DSA can lead incorrect maintenance procedures and unnecessary TSR violations. **Action:** Revise Chapter 4 and/or TSR to identify the correct SR frequency.	R	JW	**LANS:** **Verification:**
14	5-9	5.8.5	**Issue:** The description of the radiation protection program does not include the key controls (i.e. key elements) necessary to protect the workers from the hazards of ionizing radiation associated with the equipment in the characterization trailers. Failure to address a potentially significant hazard and associated controls can lead to an incomplete understanding and implementation of the controls necessary to protect the facility's workers. **Action:** Revise the section of the TSR to fully discuss the controls associated with both the radiation protection program and the national standard(s) for radiation generating devices that must be in place to protect the facility workers.	R	DJO	**LANS:** **Verification:**

R = Comment/Issue significantly affects DSA development. Response and disposition is required; S = Suggested comment. Resolution is not required; Rev. = Reviewer's Initials

ATTACHMENT 2 - EA Review New Comments

DSA-TWF-001, Documented Safety Analysis for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

TSR-TWF-002, Technical Safety Requirements for Transuranic Waste Facility (TWF), Rev. 0 (90% Submittal, 7/1/15)

No.	Page	Section/Para/Line	Reviewer Comment	R/S	Rev.	Resolution
15	6-10 ff. 6-13 ff.	6.2.6 6.2.7	**Issue:** This section does not address controls to ensure that containers received at TWF meet the physical configurations that support the accident analysis inputs. Although the external inspection is necessary, it is not sufficient for new containers, because details of the loading and assembly of the containers are available from the waste program. Failure to identify and implement controls for the initial conditions and assumptions in the hazard and accident analysis could lead to an inadequate TSR control. **Action:** Expand the section to incorporate the TSR controls necessary to protect the initial conditions and assumptions associated with the accident analysis.	R	DJO	**LANS:** **Verification:**
16	6-13	6.2.7	**Issue:** The DF for the TRU Waste Container does not credit the steel of the container, an assumption of the CSE analysis to ensure that arrays for normal and abnormal conditions remain subcritical (§5.2.1). Failure to protect analytical assumptions can lead to an inadequate TSR control. **Action:** Add the requirement to the DF that the TRU Waste containers be made of steel.	R	RRH	**LANS:** **Verification:**

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