Department of Energy
National Nuclear Security Administration
Washington, DC 20585

July 26, 2005

The Honorable A.J. Eggenberger
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W.
Suite 700
Washington, D.C. 20004-2901

Dear Mr. Chairman:

This is the final evaluation required to satisfy the first commitment in your November 3, 2004, letter. Enclosed is a memorandum from the Livermore Site Office (LSO) that forwards the report on LSO's evaluation of the application of configuration management specific to the vital safety systems in the remaining defense nuclear facilities (Buildings 331, 334, 239, 251 and Radioactive Hazardous Waste Management). On December 22, 2004, LSO transmitted to you the Building 332 Vital Safety System Evaluation. LLNL will complete its resource-loaded schedule for implementing a configuration management program for vital safety systems in Building 332 by September 1, 2005. LLNL will complete its resource-loaded schedule for implementing a configuration management program for vital safety systems in other LLNL defense nuclear facilities no later than September 15, 2005. We will transmit these schedules to you when they are complete. If you have any questions please contact me or have your staff contact Mike Thompson at 301-903-5648.

Sincerely,

Thomas P. D'Agostino
Acting Deputy Administrator
for Defense Programs

Enclosures

cc: Camille Yuan-Soo Hoo, LSO Manager
M. Whitaker, DR-1

Department of Energy
National Nuclear Security Administration
Livermore Site Office
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MAR 15 2005

MEMORANDUM FOR DR DAVID H CRANDALL
ASSISTANT DEPUTY ADMINISTRATOR
FOR RESEARCH, DEVELOPMENT AND SIMULATION

FROM CAMILLE YUAN-SOO HOO
MANAGER

SUBJECT NNSA/Livermore Site Office Response to Defense Nuclear Facilities Safety Board Request on Lawrence Livermore National Laboratory Configuration Management

The Defense Nuclear Facilities Safety Board (DNFSB) requested in their November 3, 2004, letter regarding the implementation status of Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, at the Lawrence Livermore National Laboratory (LLNL) that within 60 days NNSA/Livermore Site Office (LSO) address

- NNSA's assessment of the configuration management program as it now exists for vital safety systems at LLNL's defense nuclear facilities
- A resource-loaded schedule for implementing a configuration management program for vital safety systems at LLNL's defense nuclear facilities

Discussions with DNFSB Staff helped define the expectation for the 60-day deliverable from the NNSA LSO The approach was for an evaluation of configuration management (CM) based on an institutional review of the CM program and evaluation of the LLNL Building 332 vital safety systems (VSS) followed by an evaluation of the remaining defense nuclear facilities VSS On December 22, 2004, LSO transmitted to you the Building 332 Vital Safety System Evaluation

The attached report provides LSO's evaluation of the application of configuration management specific to the VSS in the remaining defense nuclear facilities (Buildings 331, 334, 239, 251 and RHWM) The review team performed document reviews, walkdowns of specific Building VSS, and held discussions with systems engineers, facility and operations personnel, and safety basis personnel

The attached LSO report concludes that configuration management is not complete or effective within Buildings 331, 334, and 239 Additionally, this report confirms that many of the vulnerabilities in Building 332 exist in these facilities Building 251 and the RHWM facilities configuration management programs are not fully mature, however, progress to date is encouraging

Based on the team's findings, LSO recommends that further comprehensive vital safety system assessments be performed for Buildings 331, 334 and 239 In addition, LSO continues to work with LLNL to reassess LLNL's institutional configuration management program

LLNL has provided LSO with an integrated corrective action plan for Building 332 CM that addresses the OA-40 findings, LSO VSS evaluation and the B332 Technical Safety Requirement Administrative Control Program violation This Building 332 CM corrective action plan will be forwarded to you in the near future to satisfy our commitment to the DNFSB Additionally, LLNL has been directed to develop and provide a corrective action plan for the attached report within 60 days of receipt

If you have any questions, please contact Sarah Spagnolo at 925-423-3250

Attachment

cc (w/att)
M Thompson, NA-117
J McConnell, NA-1
M Merritt, DNFSB

Department of Energy

National Nuclear Security Administration

Livermore Site Office

Evaluation

Of

Lawrence Livermore National Laboratory

Configuration Management
In
Buildings 331, 334, 239, 251
And
Radioactive and Hazardous Waste Management Facilities

Executive Summary

The National Nuclear Security Administration/Livermore Site Office (LSO) chartered review teams to evaluate the institutional application of configuration management within Buildings 331, 334, 239, 251 and Radioactive Hazardous Waste Management[1], including specific Vital Safety System (VSS) reviews. The teams consisted of Facility Representatives, LSO Operations Team Leaders, the LSO Principal System Engineer, LSO System Engineers, LSO safety basis personnel and the LSO Configuration Management Program Manager. The LSO evaluation of configuration management of VSS within these buildings used criterion based on the methodology used by the Office of Independent Oversight and Performance Assurance (OA-40) in their 2004 review of Essential Safety Systems and DOE-STD-1073-2003, Configuration Management Program. The teams performed document reviews, walkdowns of specific building VSS, discussions with contractor systems engineers, facility and operations personnel, and safety basis personnel.

This review concluded that configuration management (CM) is not complete or effective within Buildings 331, 334, and 239. For Building 251 and RHWM, configuration management is not fully matured but is being implemented adequately. Additionally, the institutional infrastructure necessary for a successful CM program is clearly deficient as noted in the previous LSO report for B332.

The review also continued to note that the commitment to institutionalize the DOE Phase II assessments (DNFSB Recommendation 2000-2) has not been satisfied and there are no institutional VSS assessments being performed in the defense nuclear facilities.

While evaluating the VSS, LSO continued to notice that many of the systems are not defined well enough to understand the system boundaries and have a lack of clear definition of system interfaces. Many systems share boundaries and have numerous interfaces; however, there is no apparent consistent approach to defining, classifying, documenting and controlling these interfaces.

This review also noted some issues concerning fundamental conduct of operations.

- Many of the systems appeared to not have procedures for performing inspection and testing.
- Almost all of the facilities in this review had major flaws in implementation of the calibration program for measurement and test equipment.
- Evaluations and reviews of modifications to VSS are being performed after the physical change has occurred which does not allow facility management to understand if the change impacts the safety function of the system.
- Oftentimes changes to VSS are not being evaluated appropriately (i.e., building penetrations).

[1] RHWM Facilities include: B612, B625, B693, B696R, B696S, B695, WIPP Mobile Vendor, T6197, T6197B, T6198

I. Background

On November 3, 2004, the Defense Nuclear Facilities Safety Board (DNFSB) transmitted a letter to the Department of Energy (DOE) expressing concern about "the apparent lack of an adequate configuration management program for the highest-hazard nuclear facilities at Lawrence Livermore National Laboratory (LLNL)". The letter requested a report from DOE within 60 days addressing:

- The National Nuclear Security Administration's (NNSA) assessment of the configuration management program for Vital Safety Systems (VSS), and
- A resource-loaded schedule for implementing a configuration management program for VSS.

Discussions with DNFSB Staff helped define the expectation for the 60-day deliverable from the NNSA Livermore Site Office (LSO). The LSO completed the first review of the LLNL configuration management program for Building 332 in December 2004 and submitted the report to NNSA/HQ on January 3, 2005. This report documents the completion of the LSO's review of the remaining defense nuclear facilities (B331, 334, 239, 251 and RHWM). This approach is for an evaluation of configuration management based on an institutional review of the configuration management program and evaluation of the Building Vital Safety Systems. NNSA/LSO has subsequently formally committed to provide a resource-loaded schedule for implementation of a configuration management program for vital safety systems within the defense nuclear facilities by September 1, 2005.

II. Purpose and Scope

The purpose of this report is to provide the NNSA/LSO evaluation of configuration management within defense nuclear facilities. This report evaluates:

- The LLNL Buildings 239, 331, 334, 251 and Radioactive and Hazardous Waste Management (RHWM) Facilities Vital Safety Systems (VSS)

III. Evaluation Activities

The NNSA/LSO performed an evaluation of LLNL Buildings 331, 334, 239, 251 and RHWM vital safety systems. This evaluation was a high level screening to determine whether significant weaknesses existed in program elements and the actual systems rather than a comprehensive system engineering assessment (Attachment 2). This evaluation consisted of reviewing compliance with the DOE/UC Contract requirements, LLNL ES&H Manual Documents 41.2 "*Configuration Management Program Description*" and 50.1 "*Personnel Selection, Qualification, Training, and Staffing at LLNL Nuclear Facilities*" and LLNL actions and commitments to DNFSB Recommendation 2000-2. The assessment criteria, details, findings, and path forward are provided in this evaluation report.

The VSS[2] listed below comprise the breadth of this review:

B331
- Tritium Gloveboxes – Safety Significant (SS)
- Elemental and Isotopic Laboratory Glovebox – SS
- Elemental and Isotopic Laboratory Glovebox Exhaust HEPA Filter – SS
- Continuous Air Monitoring – Defense in Depth (DID)

B334
- HEPA Filters and Associated Ducting –SS
- Building Structure Encompassing High Bays – SS
- Continuous Air Monitoring – DID

B239
- Daisy Chain Key Actuated – SS
- Shield Walls (structural) - SS
- Radiation Monitors and Warning Lights – SS
- Interlock Switches and Gates – SS

B251
- Glovebox Exhaust/HEPAs - SS
- Fumehoods/Exhaust - SS
- Room Exhaust – SS
- HEPA Filters (final stage) – SS
- Underground Storage Vaults – Safety Class (SC)
- Mosler Safes – SS
- Wet Pipe Fire Suppression and Backup Fire Water Tank – SS
- Backup electric Power and Diesel Tank – SS
- Continuous air Monitoring (Gloveboxes/Underground Storage Vaults) –SS

RHWM
- B625 Structural System – SS
- B612 Fire Suppression System – DID
- B612-4 Fire Suppression System – DID
- B625 Fire Suppression System - DID
- B625 Ventilation in the tent and at table-ducting, fan, HEPA Filter – DID
- B693 Structural System – SS
- B693 Fire Suppression System - DID
- B696 Structural System and 2 Hour Fire Rated Portions (B696R and B696S) – SS
- B696 Glovebox – SS
- B695 Structural System – SS
- MOVER Glovebox – SS

[2] "Lawrence Livermore National Laboratory Defense Nuclear Facilities Safety Class and Safety Significant – Defense in Depth Vital Safety System List", dated November 15, 2004

- MOVER Glovebox Operation Room Structure – SS
- TRU Waste Containers (Vents) – SS

The evaluation consisted of document reviews, walkdowns of the specific VSS, discussions with systems engineers, facility and operations personnel, and safety basis personnel. The NNSA/LSO teams consisted of the respective Building Facility Representatives, LSO Operations Team Leaders, the LSO Principal System Engineer, LSO System Engineers, LSO safety basis personnel and the LSO Configuration Management Program Manager. The team was chosen based on their knowledge of the building operations and vital safety systems. They also were chosen based on their ability to perform effectively in a short timeframe.

The team was provided with fundamental criteria and sample lines of inquiry for their review of the VSS (Attachment 3). The criteria were based on the methodology used by OA-40 in their recent review of Essential Safety Systems and DOE-STD-1073-2003, Configuration Management Program.

The lines of inquiry focused on four specific elements of configuration management that were applied to each VSS:

- Authorization Basis;
- Maintenance and Work Packages;
- Surveillance and Testing; and
- System Operations

The information generated from the criteria and lines of inquiry were qualitatively rated using a stoplight approach to grade each VSS in the four focus areas and subsequently to provide an overall 'rating' of the system. (Attachment 1)

This stoplight rating system:

BLACK – no data available
RED – significant deficiencies

GREEN – Compliant

IV. Evaluation Results and Findings

FINDINGS

B331 Vital Safety Systems

1. The Building Structure in B331 is identified as a defense-in-depth SSC. Due to the importance of the floor in ensuring that the tritium gloveboxes can meet the seismic criteria in the SAR, an evaluation of the floor should be performed to verify that the structure is classified appropriately.

2. Modification to the gas analysis system was recently completed and the updated drawing/engineering safety note is in the review and approval process. Although the modification was reviewed through the B331 work control process, the engineering safety note is still in the review and approval process. The engineering safety note should be developed, reviewed and approved prior to the physical modification of the system to ensure that the change is appropriate and that it does not adversely impact the system safety function.

3. The Building 331 Master Equipment List (MEL) is not under document control.

4. Based on discussions with a qualified Portable Tritium Processing System (PTPS) operator, the annual rate-of-rise test and integrity inspection are performed on all of the gloveboxes. However, there are no procedures for the performance of this test and inspection.

5. The Electronic rack includes equipment used to measure temperatures and pressures of the various gloveboxes. This equipment is not calibrated. In addition, the pressure differential gauges on the tritium gloveboxes (e.g., pump/transfer cart, cleanup cart, and general purpose glovebox) are not calibrated.

B334 Vital Safety Systems

6. The Nuclear Materials Technology Program (NMTP) Quality Assurance Engineer does not maintain drawings. According to Section 4.4.1.2 (System Description) of the current SAR, Plant Engineering maintains the drawing, and the Quality Assurance Engineer maintains an updated redline copy in the building file. Furthermore, NMTP does not maintain drawings for their facilities.

7. The Building 334 Master Equipment List (MEL) is not under document control.

8. The B334 structure that supports the safety significant HEPA filters and associated ducting attached to the structure are not classified commensurately.

9. The facility utilizes a portable Continuous Air Monitor (CAM) when Special Nuclear Material (SNM) is present in the facility. This is recognized in Chapter 7 of the SAR. The logbook was reviewed and indicated the CAM was de-energized in July 2004. The Facility Safety Plan (FSP) requires that the source and operating test be performed every 7 days ± 2 days when operations are being conducted in the specific bay. In addition, the Health Physics Discipline Action Plan requires that when the checks are accomplished, the results are to be recorded in the CAM log. Since July SNM has been in the facility and there is no record that the required checks were performed. The responsible Health and Safety Technician stated he had performed the checks, but forgot to record them in the log.

B239 Vital Safety Systems

10. The Building 239 Master Equipment List (MEL) is not under document control.

11. Section 4.3 of the B239 Facility Safety Plan (FSP), "Operations Requiring Prior Reviews", lists seven activities that would require a review prior to the work beginning. Structural (i.e., shield walls) penetration is not an activity on this list, only "any changes to the facility" and a few specific activities (i.e., RGD work). "Any changes to a facility" is a fairly general statement that does not allow personnel to clearly point to requirements/procedures for reviewing operations prior to initiating the work control process.

12. The Facility Safety Plan is the implementing document for the SAR, including the credited controls, administrative control programs and assumptions. The shield walls are considered a Vital Safety System; however, there is no mention of the shield walls in the FSP and any expectations for requirements or operability.

13. The project for installation of seismic restraints in Bay 9 required boring holes into the safety-significant wall between the bays. The work package for this activity included an USQD that was determined to be negative. The review in the negative USQD focused on ensuring that the seismic restraint met PC-2 seismic criteria. The USQD does not *specifically* address whether the seismic restraint work would adversely impact the safety function of the walls (i.e., protecting the worker from radiation).

B251 Vital Safety Systems

14. Several calibration issues were noted for the Glovebox Exhaust and Room Exhaust Vital Safety Systems. Many of the differential pressure gauges associated with theses systems had no calibration stickers, due dates, or had incorrect calibration stickers.

15. The Plant Maintenance (PM) data recording form for tank pressure notes that the performance criteria is 65 psig where actually the criteria for Surveillance Requirement (SR) 4.3.2 is 75 psig in the Technical Safety Requirements (TSR). The tank pressure always exceeds 75 psig however the PM record does not reflect.

16. There are no maintenance records for the fire suppression system double check valves located in the corridor near room 1027. The double check valves should be inspected every 5 years in accordance with NFPA 25.

17. The vacuum piping for the Continuous Air Monitor (CAM) is not labeled in the "hardened area" hallway or for the backup system piping in Room 1052.

RHWM Vital Safety Systems

18. The RHWM Maintenance Manual was approved in 2003. This document presents RHWM's maintenance policies and procedures. The document addresses the Maintenance Implementation Plan, maintenance organization, and training of maintenance personnel, necessary equipment to perform maintenance, types of maintenance and the Master Equipment List. The RHWM Maintenance Manual paragraph 3.3.5 states an annual review of the manual is required. There is no evidence that shows the annual review has occurred for 2004.

V. Conclusions

This review concludes that configuration management for the Vital Safety Systems is not adequately implemented in Buildings 331, 334 and 239. The issues noted in this evaluation for Buildings 331, 334 and 239 are consistent with the findings noted in the B332 VSS review. B251 and RHWM continue to mature their respective configuration management programs and progress to date is encouraging.

While evaluating the VSS, LSO continued to notice that many of the systems are not defined well enough to understand the system boundaries and have a lack of clear definition of system interfaces. Many systems share boundaries and have numerous interfaces; however; there is no apparent consistent approach to defining, classifying, documenting and controlling these interfaces.

This review also noted some issues concerning fundamental conduct of operations.

- Many of the systems appeared to not have procedures for performing inspection and testing.
- Almost all of the facilities in this review had major flaws in implementation of the calibration program for measurement and test equipment.

- Evaluations and reviews of modifications to VSS are being performed after the physical change has occurred which does not allow facility management to understand if the change impacts the safety function of the system.
- Oftentimes changes to VSS are not being evaluated at all (i.e., building penetrations).

LSO recommends that Comprehensive VSS System Reviews currently being performed in B332 also are performed for Buildings 331, 334 and 239.

Attachment 1

NNSA Configuration Management Evaluation
Of
Defense Nuclear Facilities Vital Safety Systems

	Vital Safety System	SSC	1	2	3	4	OVERALL
B331	Tritium Gloveboxes	SS	GREEN		RED	GREEN	
	Elemental and Isotopic Laboratory Glovebox	SS	N/A	N/A	N/A	N/A	N/A
	Elemental and Isotopic Laboratory Glovebox Exhaust HEPA Filter	SS	N/A	N/A	N/A	N/A	N/A
	Continuous Air Monitoring	DID	GREEN	BLACK	GREEN	GREEN	GREEN
B334	HEPA Filters and Associated Ducting	SS	GREEN		GREEN	GREEN	GREEN
	Building Structure Encompassing High Bays	SS		BLACK	GREEN	GREEN	GREEN
	Continuous Air Monitoring	DID	GREEN	BLACK	RED	GREEN	
B239	Daisy Chain Key Actuated	SS	GREEN		GREEN	GREEN	GREEN
	Shield Walls (structural)	SS	GREEN		GREEN		
	Radiation Monitors and Warning Lights	SS	GREEN		GREEN	GREEN	GREEN
	Interlock Switches and Gates	SS	GREEN		GREEN	GREEN	GREEN
B251	Glovebox Exhaust/HEPAs	SS	GREEN	GREEN		GREEN	GREEN
	Fumehoods/Exhaust	SS	GREEN	GREEN	GREEN	GREEN	GREEN
	Room Exhaust	SS	GREEN		GREEN	GREEN	GREEN
	HEPA Filters (final stage)	SS	GREEN	GREEN		GREEN	GREEN
	Underground Storage Vaults	SC	GREEN	GREEN	GREEN	GREEN	GREEN
	Mosler Safes	SS	GREEN	GREEN	GREEN	GREEN	GREEN
	Wet Pipe Fire Suppression and Backup Fire Water Tank	SS	GREEN		GREEN	GREEN	GREEN
	Backup Electric Power and Diesel Tank	SS	GREEN	GREEN	GREEN	GREEN	GREEN
	Continuous Air Monitoring (GBE/USVs)	SS	GREEN	GREEN	GREEN	GREEN	GREEN

	B625 Structural System	SS	GREEN	GREEN	GREEN	GREEN	GREEN
	B612 Fire Suppression System	DID	GREEN	GREEN	GREEN	GREEN	GREEN
	B612-4 Fire Suppression System	DID	GREEN	GREEN	GREEN	GREEN	GREEN
	B625 Fire Suppression System	DID	GREEN	GREEN	GREEN	GREEN	GREEN
	B625 Ventilation in the tent and at table – ducting, fan, HEPA filter	DID	GREEN				
	B693 Structural System	SS	GREEN	GREEN	GREEN	GREEN	GREEN
	B693 Fire Suppression System	DID	GREEN				
RHWM	B696 Structural System and 2 hour fire rated portions (B696R and B696S)	SS	GREEN	GREEN	GREEN	GREEN	GREEN
	B695 Structural System	SS	GREEN	GREEN	GREEN	GREEN	GREEN
	MOVER Glovebox	SS	N/A	N/A	N/A	N/A	N/A
	MOVER Glovebox Operation Structure	SS	N/A	N/A	N/A	N/A	N/A
	TRU Waste Containers (vents)	SS	GREEN	GREEN	GREEN	GREEN	GREEN
	B696 Glovebox	SS	GREEN	BLACK	BLACK	BLACK	BLACK

GRADING

BLACK – No data available to review
RED – Significant Deficiencies

GREEN – Compliant
N/A – See Attachment 2 Report

COLUMNS: 1) Authorization Basis
2) Maintenance and Work Packages
3) Surveillance and Testing
4) System Operations

Legend

SC – Safety Class
SS – Safety Significant
DID – Defense in Depth

Attachment 2

B331 VSS Evaluation Report

1. Tritium Gloveboxes

Authorization Basis – GREEN

Review of the current approved Building 331 SAR indicated that the tritium glovebox safety function appears to be adequately summarized as a safety-significant SSC. It appears that the tritium gloveboxes are seismically secured to the floor. It is recognized that the structure is identified as a defense-in-depth SSC in the Building 331 SAR. However, due to the importance of the floor in ensuring that the tritium gloveboxes can meet the seismic criteria in the SAR, an evaluation of this part of the structure should be performed to determine if the structure is classified appropriately.

A walkdown of the tritium gloveboxes was performed with a qualified Portable Tritium Processing System (PTPS) operator. Review of selected tritium glovebox system drawings indicated that drawings are up-to-date, with the exception of the gas analysis cart.

Maintenance and Work Packages –

The Master Equipment List is not under document control.

Modification to the gas analysis system was recently completed and the updated drawing/engineering safety note is in the review and approval process. Although the modification was reviewed through the B331 work control process, the engineering safety note is still in the review and approval process. The engineering safety note should be developed, reviewed and approved prior to the physical modification of the system to ensure that the change is appropriate and that it does not adversely impact the system safety function.

Surveillance and Testing – RED

The Glovebox Maintenance Program, which is one of the Building 331 TSR administrative control programs, requires that the tritium gloveboxes have an annual inspection to ensure physical integrity and an annual pressure differential rate-of-rise test. Based on discussions with a qualified PTPS operator, the annual rate-of-rise test and integrity inspection are performed on the all of the gloveboxes. There are no procedures for the performance of this test and inspection. Note that based on discussions with the Building 331 facility staff, procedures are currently being prepared for this test and inspection.

The electronic rack includes equipment that are used to measure temperatures and pressures of the various gloveboxes. This equipment is not calibrated. In addition, the pressure differential gauges on the tritium gloveboxes (e.g., pump/transfer cart, cleanup cart, and general purpose glovebox) are not calibrated. An evaluation of the need to calibrate the above equipment is recommended as it appears that they provide a visual indicator that the glovebox is performing as required during the annual rate-of-rise test and during normal glovebox operations.

System Operations - GREEN

Review of occurrence reports from 2003 to present indicated no issues relating to system operation of the tritium gloveboxes.

Overall –

2. Elemental and Isotopic Laboratory Glovebox

Although this VSS is identified as a safety-significant SSC in the Building 331 SAR, the design details for this glovebox and ventilation system remain incomplete as funding for this VSS has been delayed. LSO has not approved start up of the Elemental and Isotopic Laboratory Glovebox. Per LSO direction, this VSS shall be removed from the SAR and TSR as funding for this glovebox continues to be delayed. Refer to LSO document #LSONST:030051, dated September 5, 2003.

Overall – N/A

3. Elemental and Isotopic Laboratory Glovebox Exhaust HEPA Filter

Although this VSS is identified as a safety-significant SSC in the Building 331 SAR, the design details for this glovebox and ventilation system remain incomplete as funding for this VSS has been delayed. LSO has not approved start up of the Elemental and Isotopic Laboratory Glovebox. Per LSO direction, this VSS shall be removed from the SAR and TSR as funding for this glovebox continues to be delayed. Refer to LSO document #LSONST:030051, dated September 5, 2003.

Overall – N/A

4. Continuous Air Monitoring

Authorization Basis – GREEN

No walkdown of the continuous air monitoring system was performed. There were no issues identified during review of the B331 SAR. Although the Building 331 SAR identifies the continuous air monitor as a defense-in-depth SSC, there are currently no operations/activities requiring the use of this VSS. The use of continuous air monitors will be required for a future activity, CO_2 cleaning operations, but this activity has not been approved by LSO.

Maintenance and Work Packages – BLACK

No work packages were generated in the last year.

Surveillance and Testing – GREEN

No documents associated with surveillance and testing criteria reviewed for this VSS.

Systems Operations – GREEN

Review of occurrence reports from 2003 to present indicated no issues relating to system operation of the continuous air monitor.

Overall – GREEN

B334 VSS Evaluation Report

1. HEPA Filters and Associated Ducting

Authorization Basis - GREEN

The HEPA system was replaced early in 2003. The Safety Analysis Report (SAR) designates the system as safety significant. This safety significant system is located in the facility equipment room outside the designated safety significant building structure.

Maintenance and Work Packages -

There were no maintenance activities or work packages available to review under the new work control manual dated October 2003.

The HEPA filter plenums, filters and inlet ducting were replaced early in 2003. The process utilized the Lab Integrated Work Sheet (IWS) process to remove the old system and install the new system. The drawings associated with the replacements were submitted to Plant Engineering for updates to the existing facility drawings. The NMTP Quality Assurance Engineer does not maintain drawings as required by the current Safety Analysis Report (SAR).

The Master Equipment List (MEL) is not under document control.

Surveillance and Testing - GREEN

The following surveillance requirement procedures were reviewed:

SRP-334-001 (Surveillance Requirement Procedure SR 4.1.1 Quarterly, Check HEPA Filter Pressure Differential)

No issues identified

SRP-334-002 (Surveillance Requirement Procedure SR 4.1.2 Annual, HEPA Filter In-Place Leak Test)

It is not apparent the attached Industrial Hygiene Instrument Lab Procedure was reviewed during the document approval process. The attachment was not filed with the master copy of the procedures.

SRP-334-003 (Surveillance Requirement Procedure SR 4.1.3 Annually, Inspect Safety-Significant Ducting)

No issues identified

System Operation - GREEN

Review of the ORPS GUI from 2003 through 2004 identified no reportable occurrences relating to system operability.

Overall - GREEN

2. Building Structure Encompassing High Bays

Authorization Basis –

The B334 structure that supports the safety significant HEPA filters and associated ducting attached to the structure are not classified commensurately.

The as built drawings listed in the SAR were developed in 1985 and the SAR indicates they were modified to reflect the addition of the shielding blocks. The SAR requires the NMTP QA engineer to maintain a current set of redline drawings. These drawings are not being maintained and NMTP in general does not maintain drawings.

Maintenance and Work Packages - BLACK

There have been no maintenance activities or work packages associated with the facility structure within the past two years.

Surveillance and Testing - GREEN

ACP-B334-002 (Annual Visual Inspection of Building 334 High Bay Structure and Exterior Exit Door Seals)
No issues identified

System Operations - GREEN

Review of the ORPS GUI from 2003 through 2004 identified no reportable occurrences relating to system operability of the structure.

Overall - GREEN

3. Continuous Air Monitoring

Authorization Basis - GREEN

The CAMs are identified in the SAR as a defense-in-depth feature important to worker safety. The CAMs are also an important element of the Radiation Protection Program.

Maintenance and Work Packages - BLACK

There were no maintenance activities or work packages available to review. The CAM is changed out if there is a discrepancy.

Surveillance and Testing - RED

The facility utilizes a portable CAM when SNM is present in the facility. This is recognized in Chapter 7 of the SAR. The logbook was reviewed and indicated the CAM was de-energized in July 2004. The FSP requires that the source and operating test be performed every 7 days ± 2 days when operations are being conducted in the specific bay. In addition, the Health Physics Discipline Action Plan (DAP) requires that when the checks are accomplished, the results are to be recorded in the CAM log. Since July SNM has been in the facility and there is no record that the required checks were performed. The responsible Health and Safety Technician stated he had performed the checks, but forgot to record them in the log. The Health Physics DAP provides the instruction on how to perform the operational checks. As noted above, the procedure was not followed consistently since July 2004.

System Operations - GREEN

Review of the ORPS GUI from 2003 through 2004 identified no reportable occurrences relating to system operability of the continuous air monitors.

Overall -

B239 VSS Evaluation Report

1. Daisy Chain Key Actuated

Authorization Basis - GREEN

The documents reviewed for the authorization basis were the Radiography Facility Building 239 Safety Analysis Report, 10 CFR 830 Compliant Documented Safety Analysis, UCRL-AR-147501-03, dated February 2003, the Radiography Facility - Building 239 Technical Safety Requirements, UCRL-AR-147502-03, dated February 2003, and applicable Unreviewed Safety Questions (USQs). Chapter 2 of the SAR provides the descriptions for the safety systems and Chapter 4 of the SAR identifies the functional requirements, performance criteria and controls for the safety systems. The system descriptions, functional requirements, performance criteria and controls are adequately defined.

The system engineer is knowledgeable of the system, performs walkdowns and maintains up-to-date plans for the system.

A review of USQ screenings, evaluations, and determinations from 2003 to present indicated that none were related to this VSS.

Maintenance and Work Packages -

A Master Equipment List (MEL) for Building 239 is not under document control.

No work packages were reviewed for this VSS as there were no changes or modifications made to this system since 2003.

Surveillance and Testing - GREEN

Surveillance Requirement Procedure, SRP-239-001, is the document used for the semi-annual daisy chain key-actuated interlock system operability test. This SRP implements the Technical Safety Requirement (TSR) Surveillance Requirement, SR 4.1.1. The Building 239 TSR identifies SR 4.2.1.1 as the semi-annual inspection and operability test for the daisy chain actuated interlock system. Verification has determined that this correction has been made to the draft Building 239 TSR annual update.

Surveillance Requirement Procedure, SRP-239-002, is used for the semi-annual interlock switches and gates operability test. This SRP implements TSR SR 4.1.2. The Building 239 TSR identifies SR 4.2.2.1 as the semi-annual inspection and operability test for the interlock switches and gates. Verification has determined that this correction has been made to the draft Building 239 TSR annual update.

System Operations - GREEN

A review of occurrence reports from 2003 to present indicated no issues relating to system operation of the daisy chain key-actuated interlock system.

Overall - GREEN

2. Shield Walls (Structural)

Authorization Basis - GREEN

The Building 239 shielding walls are a passive design feature and are safety significant in the current, approved SAR/TSR. The safety function of the walls is to minimize worker exposure to radiation in the Control Room or in the opposing high bay during radiography operations (Section 4.4.1.1). A SAR Performance Criterion stipulates that a "penetration through the shield walls is only to be made after an evaluation of the impacts is made".

Not all B239 personnel appear to be fully aware of the process for modifying or updating drawings. Further investigation revealed that updated drawings are maintained at B239.

Maintenance and Work Packages -

The Building 239 Master Equipment List (MEL) is not under document control.

Only one project was noted to have been completed after the current SAR/TSR was approved by LSO. This project was the seismic restraint of an item located in Bay 9 which required boring holes into the safety-significant wall between the bays. The work package for this activity included an USQ that was determined to be negative. The review of the USQ noted that the negative USQ appeared to focus on ensuring that the seismic restraint met PC-2 seismic criteria. The USQ never *specifically* addressed whether the seismic restraint work would adversely impact the safety function of the walls (i.e., protecting the worker from radiation).

Surveillance and Testing - GREEN

No surveillances or other testing are listed in the SAR/TSRs for this passive design feature.

System Operations –

One observation was made after the review of the B239 Facility Safety Plan (FSP). Section 4.3 entitled "Operations Requiring Prior Reviews" lists seven activities that would require a review prior to the work beginning. No mention is made that the

penetration of the shield walls requires an assessment, only any "changes to the facility" and a few specific activities (relating to operations like RGD work). It would appear that "any changes to a facility" is a fairly general statement that does not allow personnel to clearly point to a procedure justifying that an assessment must be completed and the work control process initiated.

Furthermore, there is no mention of shield walls in the FSP, which should be the implementing document for the DSA.

Overall -

3. Radiation Monitors and Warning Lights

Authorization Basis - GREEN

The documents reviewed for the authorization basis were the Radiography Facility Building 239 Safety Analysis Report, 10 CFR 830 Compliant Documented Safety Analysis, UCRL-AR-147501-03, dated February 2003, the Radiography Facility - Building 239 Technical Safety Requirements, UCRL-AR-147502-03, dated February 2003, and applicable Unreviewed Safety Questions (USQs). Chapter 2 of the SAR provides the descriptions for the safety systems and Chapter 4 of the SAR identifies the functional requirements, performance criteria and controls for the safety systems. The system descriptions, functional requirements, performance criteria and controls are adequately defined.

The Radiation Area Monitors (RAMs) are in a calibration program and all calibrations were current.

A review of USQ screenings, evaluations, and determinations from 2003 to present indicated that none were related to this VSS.

Maintenance and Work Packages -

The B239 MEL is not under document control.

No work packages were reviewed for this VSS as there were no changes or modifications made to this system since 2003.

Surveillance and Testing - GREEN

SRP-239-003 and -004 were reviewed and no issues identified.

System Operations - GREEN

A review of occurrence reports from 2003 to present indicated no issues relating to system operation of the daisy chain key-activated interlock system.

Overall – GREEN

4. Interlock Switches and Gates

Authorization Basis - GREEN

The documents reviewed for the authorization basis were the Radiography Facility Building 239 Safety Analysis Report, 10 CFR 830 Compliant Documented Safety Analysis, UCRL-AR-147501-03, dated February 2003, the Radiography Facility - Building 239 Technical Safety Requirements, UCRL-AR-147502-03, dated February 2003, and applicable Unreviewed Safety Questions (USQs). Chapter 2 of the SAR provides the descriptions for the safety systems and Chapter 4 of the SAR identifies the functional requirements, performance criteria and controls for the safety systems. The system descriptions, functional requirements, performance criteria and controls are adequately defined.

The cognizant system engineer is knowledgeable of the system, performs walkdowns and maintains up-to-date plans for the system.

A review of USQ screenings, evaluations, and determinations from 2003 to present indicated that none were related to this VSS.

Maintenance and Work Packages -

The B239 MEL is not under document control.

No work packages were reviewed for this VSS as there were no changes or modifications made to this system since 2003.

Surveillance and Testing - GREEN

SRP-239-002 was reviewed and no issues identified.

System Operations - GREEN

A review of occurrence reports from 2003 to present indicated no issues relating to system operation of the daisy chain key-activated interlock system.

Overall - GREEN

B251 VSS Evaluation Report

1. Glovebox Exhaust/HEPAs

Authorization Basis - GREEN

The applicable documents reviewed for the Authorization Basis were the *Heavy Element Facility – B251, Safety Analysis Report (SAR)*, dated April 1, 2003, UCRL-AR-113377 Rev 2, and the *Technical Safety Requirements for Building 251 Heavy Element Facility*, dated January 2004, UCRL-AR-145640, Rev 4. Chapter 4 of the SAR provides the descriptions for the safety systems and Chapter 11 of the SAR identifies the functional requirements and controls for the safety systems. The system descriptions, functional requirements and controls are adequately defined.

The LLNL system engineer has walked down the system and their corresponding HEPA filters and completed system data sheets per the facility configuration management program. The data sheets identify the status of the system, descriptions, design requirements, boundaries, applicable interfaces, and affected documents. The system engineer has updated (pen and ink changes) the system drawings to document the current configurations.

Maintenance and Work Packages - GREEN

Preventive maintenance documents for the glove box exhaust air handler (FGBE 1000/2000), which are performed quarterly by Plant Engineering, were reviewed and no issues identified.

Surveillance and Testing -

TSR surveillance requirement SR 3.5.1 verifies the functionality of the glove box exhaust alarm system and is implemented by procedure 251-MNT-104. TSR SR 3.5.2 verifies the glovebox exhaust differential pressure and is implemented by procedure 251-MNT-105. Final stage HEPA filter in-place leak tests, TSR SR 3.5.3 requires the performance of in-place leak tests for the final stage HEPA filter and is implemented by procedure 251-MNT-106.

HEPA filter test records show that all glovebox exhaust filters are tested annually. However, test results reported to management do not identify that results may be limited due to system design conditions. The LLNL HEPA Filter In-Place Leak Test Procedure requires the technician to annotate these limited test results and report to the facility management. Evidence of these annotations could not be found.

The calibration sticker for differential pressure gage GBE-PDI-400, which monitors glove box exhaust in Room 1364, identifies calibration was due 5/16/03. The FPOC stated the calibration dates are every three years and the sticker was mistakenly not

replaced. Differential pressure gage GBE-PDI-410, which monitors glove box exhaust in Room 1150, does not have a calibration sticker. Differential pressure gages GBE-PDI-415, 416 and SMP-PDI-400, which monitor exhaust for the Underground Storage Vaults (USVs) and hot cells in Room 1320, do not have calibration stickers.

All HEPA filters meet the 99.97% Nuclear Facility HEPA filter efficiency standard and 99.90 percent filtration efficiency specified in the B251 SAR and were operable per SAR design specifications. All systems are operating within their design air flow range. Filters for nearly all systems have exceeded LLNL service life criteria but continue to meet surveillance requirements. Two filters show signs of excessive loading and are currently in the replacement process.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) revealed no reportable occurrences relating to glovebox exhaust/HEPAs system operability.

Overall - GREEN

2. Fumehoods/Exhaust

Authorization Basis - GREEN

The applicable documents reviewed for the Authorization Basis were the *Heavy Element Facility – B251, Safety Analysis Report (SAR)*, dated April 1, 2003, UCRL-AR-113377 Rev 2, and the *Technical Safety Requirements for Building 251 Heavy Element Facility*, dated January 2004, UCRL-AR-145640, Rev 4. Chapter 4 of the SAR provides the descriptions for the safety systems and Chapter 11 of the SAR identifies the functional requirements and controls for the safety systems. The system descriptions, functional requirements and controls are adequately defined.

The LLNL system engineer has reviewed the existing fumehoods exhaust system and their corresponding HEPA filters and completed data sheets per the facility configuration management program. The data sheets identify the status of the system, descriptions, design requirements, boundaries, applicable interfaces, and effected documents. The system engineer has updated (pen and ink changes) the system drawings to document the current configurations.

Maintenance and Work Packages - GREEN

No issues were identified.

Surveillance and Testing - GREEN

TSR surveillance requirement SR 3.8.1 verifies the functionality of the fume hood exhaust and is implemented by 251-OPS-103 and 251-FRM-112.

Final stage HEPA filter in-place leak tests, TSR surveillance requirement SR 3.8.2, are implemented by procedure 251-MNT-106.

Fume hood flow rate measurements, TSR surveillance requirement SR 3.8.3, are implemented by procedure 251-MNT-117.

Fume hood smoke tests, TSR surveillance requirement SR 3.8.4, are implemented by procedure 251-OPS-127 and 251-FRM-113.

Verification of air flow movement in the fume hood, TSR surveillance requirement SR 3.8.5, is implemented by procedure 251-OPS-127 and 251-FRM-113.

No issues were identified.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to fume hood exhaust system operability.

Overall - GREEN

3. Room Exhaust

Authorization Basis - GREEN

The applicable documents reviewed for the Authorization Basis were the *Heavy Element Facility – B251, Safety Analysis Report (SAR)*, dated April 1, 2003, UCRL-AR-113377 Rev 2, and the *Technical Safety Requirements for Building 251 Heavy Element Facility*, dated January 2004, UCRL-AR-145640, Rev 4. Chapter 4 of the SAR provides the descriptions for the safety systems and Chapter 11 of the SAR identifies the functional requirements and controls for the safety systems. The system descriptions, functional requirements and controls are adequately defined. The facility has copies of drawings for the system and they are maintained by Plant Engineering.

The LLNL cognizant system engineer has walked down the system and completed data sheets per the facility configuration management program. The data sheets identify the status of the system, descriptions, design requirements, boundaries, applicable interfaces, and effected documents. The system engineer has updated (pen and ink changes) the system drawings to document the current configuration.

Maintenance and Work Packages -

In 2003, the facility performed an assessment and evaluation of the measuring and test equipment and subsequently replaced many of the differential pressure magnehelic gages. Calibration periods were determined for the differential pressure gages (manometers and magnehelic gages). Procedure 251-ADM-119 was issued to provide a graded approach for evaluating measuring and test equipment. Procedure 251-ADM-110 was issued to provide instructions on how to monitor interim conditions when a gage is out-of-service. Preventive maintenance documents for the room exhaust air handler (FFE 1000/2000), which are performed quarterly by Plant Engineering, were reviewed with no issues identified.

The Master Equipment List (MEL) is maintained by Plant Engineering. The MEL includes the plant material identification number, type, applicable task codes, priority, and maintenance frequency for all listed equipment.

Surveillance and Testing - GREEN

Verification of pressure differential between hallway and room, TSR surveillance requirement SR 3.7.1, is implemented by procedure 251-OPS-100 and Form 251-FRM-112. No findings were identified after review of SR records.

Annual verification of HEPA filters, TSR surveillance requirement SR 3.7.2, is implemented by procedure 251-MNT-106. No issues were identified.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to room exhaust system operability.

Overall - GREEN

4. Underground Storage Vaults

Authorization Basis - GREEN

The applicable documents reviewed for the Authorization Basis were the *Heavy Element Facility – B251, Safety Analysis Report (SAR)*, dated April 1, 2003, UCRL-AR-113377 Rev 2, and the *Technical Safety Requirements for Building 251 Heavy Element Facility*, dated January 2004, UCRL-AR-145640, Rev 4. Chapter 4 of the SAR provides the descriptions for the safety systems and Chapter 11 of the SAR identifies the functional requirements and controls for the safety systems. The system descriptions, functional requirements and controls are adequately defined. The facility has copies of drawings for the system and they are maintained by Plant Engineering.

The LLNL cognizant system engineer has walked down the system and completed data sheets per the facility configuration management program. The data sheets identify the status of the system(s), descriptions, design requirements, boundaries, applicable interfaces, and effected documents.

Maintenance and Work Packages - GREEN

No maintenance and work procedures were reviewed for the Underground Storage Vaults (USVs).

Surveillance and Testing - GREEN

Verification that USV cover plates are in place upon closure and quarterly thereafter, TSR surveillance requirement SR 4.1.1.1, is implemented by procedure, 251-TIP-106 and Form 251-FRM-109. Tamper indicating devices are put on each vault after closure. No findings were identified after review of SR records.

System Operations - GREEN

Procedure 251-TIP-106 is utilized for opening the USVs for inspection, retrieval, replacement and/or addition of inventory material. A review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to USV system operability.

Overall - GREEN

5. HEPA Filters (final stage)

Authorization Basis - GREEN

Final HEPA filtration stages are discussed in individual exhaust system descriptions in their sections of the B251 Safety Analysis Document. The Cognizant System Engineer has reviewed existing exhaust systems and their HEPA filtration stages and prepared System Data Sheets that describe the system, its boundary, interfaces, design requirements, documentation (drawings, AB documents, plans and procedures as well as preventative maintenance.) Pen and ink changes have been made on system diagrams to document their current configuration.

Maintenance and Work Packages - GREEN

B-251 HEPA Filter Replacement Procedure, 251-MNT-08, describes HEPA filter change out procedures in detail. It specifically addresses normal change out operations for standard conditions and directs the development of specific procedures for unusual conditions. When filters are replaced three records are created or

updated: Procedure 251-MNT-108 that details the replacement procedures; Form 251-FRM-121 that is a worksheet summarizing all HEPA filter systems status for B-251; and Form 251-FRM-122 that assesses the condition of the system being worked on.

Surveillance and Testing –

B-251 Maintenance Procedure, 251-MNT-06, describes HEPA filter testing by referring to a generic Hazards Control document, HEPA Filter In-Place Leak Test Procedure, Procedure No.: 1.0 (Rev 5). HEPA Filter and In-place Leak Testing Standard (UCRL-AR-133354 Rev 2), establishes HEPA filter establishes policy and standards for testing and performance. All B-251 HEPA filters are tested annually.

The B-251 DSA, based on accident analyses, notes that the B-251 HEPA final stage filters need only be 99.90% efficient. Five B-251 final stage HEPA filters met the 99.90% DSA but not the 99.97 Nuclear Facility efficiency standard. LLNL indicates that HEPA filters not meeting the DSA requirement will be given first priority for replacement and those not meeting the LLNL requirement will be given second priority. To date, B251 has no first-priority basis HEPA filters and the identified second priority replacement filters have been scheduled for replacement.

The designs of two exhaust system final stage HEPA filter sets do not meet UCRL minimum specifications to allow their accurate testing. Final stages consist of sets of 2 bell-mouthed HEPA filters closely connected in series, in such a way that there is not enough travel between injection, points, filters and test points to ensure that there is adequate mixing to allow accurate testing. HEPA Filter in-place leak test results reported to management do not identify that results may be limited due to system design conditions. The LLNL HEPA Filter In-Place Leak Test Procedure requires the technician to annotate these limited test results and report to the facility management. Evidence of these annotations could not be found.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) revealed no reportable occurrences relating to system operability.

Overall - GREEN

6. Mosler Safes

Authorization Basis - GREEN

The applicable documents reviewed for the Authorization Basis were the *Heavy Element Facility – B251, Safety Analysis Report (SAR)*, dated April 1, 2003, UCRL-AR-113377 Rev 2, and the *Technical Safety Requirements for Building 251 Heavy*

Element Facility, dated January 2004, UCRL-AR-145640, Rev 4. Chapter 4 of the SAR provides the descriptions for the safety systems and Chapter 11 of the SAR identifies the functional requirements and controls for the safety systems. The system descriptions, functional requirements and controls are adequately defined.

The LLNL cognizant system engineer has walked down the system and completed data sheets per the facility configuration management program. The data sheets identify the status of the system, descriptions, design requirements, boundaries, applicable interfaces, and effected documents.

Maintenance and Work Packages - GREEN

No maintenance and work procedures were reviewed for the Mosler safes.

Surveillance and Testing - GREEN

Verification of proper safe closure upon closing and quarterly thereafter, TSR surveillance requirement SR 4.2.1.1, is implemented by procedure, 251-ADM-118. Tamper indicating devices are put on each vault after closure. No findings were identified after review of SR records.

System Operations - GREEN

Procedure 251-ADM-107 is utilized for opening the safes for inspection, retrieval, replacement and/or addition of inventory material. A review of the occurrence reporting database (ORPS) revealed no reportable occurrences relating to the Mosler safes operability.

Overall - GREEN

7. Wet Pipe Fire Suppression and Backup Fire Water Tank

Authorization Basis - GREEN

The applicable documents reviewed for the Authorization Basis were the *Heavy Element Facility – B251, Safety Analysis Report (SAR)*, dated April 1, 2003, UCRL-AR-113377 Rev 2, and the *Technical Safety Requirements for Building 251 Heavy Element Facility*, dated January 2004, UCRL-AR-145640, Rev 4. Chapter 4 of the SAR provides the descriptions for the safety systems and Chapter 11 of the SAR identifies the functional requirements and controls for the safety systems. The system descriptions, functional requirements and controls are adequately defined.

The sprinkler system was designed in 1961 and is a non-standard hydraulically designed wet-pipe fire sprinkler system, sized smaller than the standard, to minimize the quantities of water discharge and thereby reduce criticality hazard. The seismic

bracing for the sprinkler piping does not conform to current standards. In1987, Factory Mutual conducted a review of the fire sprinkler system and concluded that system upgrades were not necessary due to the light combustible loading in the facility. The building has a 3000 gallon backup water supply tank that supplies water to the upgraded hardened area if the main LLNL water supply fails. The building fire hazards analysis has a detailed description of the fire suppression system.

Maintenance and Work Packages -

The B-251 TSR, Fire Protection Program surveillance requirements protect the design features. The SAR/TSR state that all fire suppression systems shall be inspected and tested based on applicable NFPA requirements. From the review of the Master Equipment List (MEL), Plant Engineering and Utel have the maintenance responsibility for the fire suppression systems. Plant Engineering uses their "Configuration Management Plan for Fire Suppression, Detection and Alarm System" to conduct maintenance for life safety systems. Based on the review of the Plant Engineering Maintenance Operations Procedures MOP-00001 and MOP-164005, and Utel fire suppression systems maintenance work order for B251, the maintenance program in B251 is adequate.

The procedure "Utel Work Order/PM" for the backup fire water tank at B-251did not use the correct pressure reading. TSR SR 4.3.2 indicates the water tank pressure should not go below a pressure of 75 psig. The PM procedure reviewed indicated that the water tank pressure should not to be less than 65 psig. The tank pressure always exceeds 75 psig however the PM record does not reflect the true measurements.

PM testing records from plant engineering are adequate except for one fire suppression system double check valve located in the corridor near room 1027. There are no maintenance records for the double check valve. The double check valve should be inspected every 5 years in accordance with NFPA 25. The facility managers know of the finding and are working with plant engineering to replace the check valve. The check valve should be replaced within a few months. Fire sprinkler drawings are adequate.

Surveillance and Testing - GREEN

The B-251 TSR, Section 3-4.3 provides the surveillance and testing requirements for the system. According to the SAR Fire Protection Program, the LLNL Fire Department conducts surveillances of the fire suppression system using the LLNL Fire Department "Fire Protection and Life Safety Equipment Inspection Program", Procedure 1500. Based on the records reviewed, the Fire Department surveillances and Plant Engineering testing are adequate.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) revealed no reportable occurrences relating to the system operability.

Overall - GREEN

7. Backup Electric Power and Diesel Tank

Authorization Basis - GREEN

The applicable Authorization Basis is UCRL-AR-113377 Rev 2, Heavy Element Facility –B251, Safety Analysis Report (SAR) dated April 1, 2003. Chapter 4 of the SAR provides a description of all of the safety systems. Chapter 11 of the SAR identifies the functional requirements and controls for the safety systems. The functional requirements and controls are adequately defined.

Technical safety requirements are delineated in UCRL-AR-145640 Rev 4.

The Cognizant System Engineer has reviewed the existing Back-up Electrical Power system, prepared System Data Sheets that describe the system, its boundary, interfaces, design requirements, documentation (drawings, AB documents, plans and procedures as well as preventative maintenance.) Pen and ink changes have been made on system diagrams to document their current configuration.

Several years ago a portable generator, GDE-44, was used for several months replacing the main backup generator, GDE -3, which was being repaired. B251 did not appropriately implement the USQD process; however, LSO determined that the facility was within its safety basis and no further action necessary. All repairs were made and the original generator is back in service.

Maintenance and Work Packages - GREEN

PE Task codes reference DOE Order 4330.4A "Maintenance Management Plan" and not the new Maintenance Implementation Plan for DOE O433.1. As-builts appear in order and changes are documented in pen and ink. Some drawings have been changed to the new ACAD system.

Surveillance and Testing - GREEN

SR 4.4.1 - Tests back-up power system and Automatic Transfer Switches (ATS) A-annually.

The following task orders implementing this SR and appear to be in order:

- PE Task code HV-64 is the procedure check list implementing this SR for ATS 01 with Generator GDE-03 and portable GDE-44

- PE Task code HV-71 is the procedure check list implementing this SR for ATS 02 with Generator GDE-02. This SR was performed monthly instead of annual.

SR 4.4.2 - Annual load test

The following task orders implementing this SR appear to be in order:

- PE Task code HV-69 is the procedure check list implementing this SR for Generator GDE-03 and GDE-03
- PE Task code HV-02 is the procedure check list implementing this SR for portable Generator GDE-44.

SR 4.4.3 - Verify Back-up Diesel Generator (BDG) voltages and frequency – monthly

The following task orders implementing this SR appear to be in order:

- PE Task code HV-64 is the procedure check list implementing this SR for Generator GDE-03 and GDE 44.
- PE Task code HV-71 is the procedure check list implementing this SR for Generator GDE-02.
-

Note: SR 4.4.1 and SR 4.4.3 were performed on portable generator GDE -44 when it was in service.

SR 4.4.4 - Verify fuel tank level at least 50% full.

The following task orders implementing this SR appear to be in order:

- PE Task code HE-72 is the procedure check list implementing this SR for Generator GDE-02 and GDE 03.
- PE Task code HE-50 is the procedure check list implementing this SR for portable Generator GDE-44.
- HE-50 for GDE-44 July 2004 was left blank. Only supervisor signature, no employee signature.
- A typo in references - should be B251 SR 4.4 not 4.3.

System Operations - GREEN

Review of ORPS revealed no reportable occurrences relating to the operability of the Back-up Electrical Power System for the past 5 years.

Overall - GREEN

9. Continuous Air Monitoring

Authorization Basis - GREEN

The applicable documents reviewed for the Authorization Basis were the *Heavy Element Facility – B251, Safety Analysis Report (SAR)*, dated April 1, 2003, UCRL-AR-113377 Rev 2, and the *Technical Safety Requirements for Building 251 Heavy*

Element Facility, dated January 2004, UCRL-AR-145640, Rev 4. Chapter 4 of the SAR provides the descriptions for the safety systems and Chapter 11 of the SAR identifies the functional requirements and controls for the safety systems. The system descriptions, functional requirements and controls are adequately defined. The facility has copies of drawings for the system and they are maintained by Plant Engineering.

The cognizant system engineer has walked down the system and completed data sheets per the facility configuration management program. The data sheets identify the status of the system(s), descriptions, design requirements, boundaries, applicable interfaces, and effected documents.

Maintenance and Work Packages - GREEN

Plant Engineering performs preventive maintenance, quarterly, on the liquid ring vacuum pumps, 251PVLR 01 and 02. These pumps are the primary system and are located in Room 1228A. The backup system, pumps 251PVM 03 and 04, are located in Room 1052. The preventive maintenance for the backup system is performed semiannually.

Surveillance and Testing - GREEN

Verification of functionality for the CAM monitoring glove box and USV exhausts (FGBE/FFE 1000/2000), TSR surveillance requirement SR 3.6.1, is satisfied by Plant Engineering quarterly preventative maintenance for the liquid ring vacuum pump. No findings were identified after review of SR records.

System Operations - GREEN

Review of ORPS revealed no reportable occurrences relating to the Continuous Air Monitoring System.

Overall - GREEN

RHWM VSS Evaluation Report

1. B625 Structural System

Authorization Basis – GREEN

B625 is a waste storage and treatment facility, so the structure itself does not contribute to operations except to provide secondary containment berms for portions of the facility, and to protect personnel, equipment and waste from the elements. The Safety basis descriptions are adequate.

Maintenance and Work Packages - GREEN

On April 29, 2004 RHWM approved the RHWM Work Permit Process. The purpose of this document is to ensure that work performed in RHWM facilities by others such as Plant Engineering is performed in accordance with RHWM requirements.

The RHWM Maintenance Manual was approved in 2003. This document presents RHWM's maintenance policies and procedures. The document addresses the Maintenance Implementation Plan, maintenance organization, and training of maintenance personnel, necessary equipment to perform maintenance, types of maintenance and the master equipment list. The RHWM maintenance manual paragraph 3.3.5 states an annual review of the manual is required. There is no evidence that shows the annual review has occurred for 2004.

Surveillance and Testing - GREEN

Per the TSR, the structure is inspected every 5 years. Personnel are routinely in B625 and would notice significant structural deterioration. There are numerous large dents in the southern wall of B625 due to drum handling and general operations.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to this system.

Overall - GREEN

2. B612 Fire Suppression System

Authorization Basis - GREEN

The applicable safety basis is the RHWM DSA for the Waste Storage Facilities May 2004. Chapter 2 of the DSA provides the description of the fire suppression systems, a fire sprinkler system meeting NFPA 13 requirements. The fire suppression system is installed in the building to control fire and to prevent fire propagation, and prevent an off-site release of hazardous material that will threaten the public health, consistent with the RWHM defense in depth philosophy. Building 612 has a sprinkler system meeting NFPA requirements. The building fire hazards analysis also have a more detailed description of the fire suppression system. The safety basis descriptions are adequate.

Maintenance and Work Packages - GREEN

From review of the RHWM Maintenance Manual, Plant Engineering and Utel has the responsibility for maintenance of the fire suppression systems. Plant Engineering uses their "Configuration Management Plan for Fire Suppression, Detection and Alarm System" to conduct maintenance on Life Safety systems. Based on the review of the Plant Engineering Maintenance Operations Procedures MOP-00001 and MOP-164005, and Utel fire suppression systems maintenance work order for the building, the maintenance program is adequate. Wet pipe sprinkler system shop drawings are adequate.

Surveillance and Testing - GREEN

The TSR Fire Protection Program states that all fire suppression systems shall be inspected and tested based on applicable NFPA requirements. The LLNL Fire Department conducts surveillances of the fire suppression system using the LLNL Fire Department "Fire Protection and Life Safety Equipment Inspection Program", Procedure 1500. Plant Engineering conducts testing of the fire suppression systems using the Maintenance Operations Procedures (MOPs) noted previously. From the records reviewed, the Fire Department surveillances are adequate. From the records reviewed, Plant Engineering wet pipe sprinkler system testing records showing the static pressure of 65 and residual pressure of 65 with no drop in pressure after flowing drain valve in December. Additionally, the flow alarm in that month come in around 40 seconds compared with 18 to 20 seconds in previous testing. The Fire Protection Engineers should review these results further.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to this system.

Overall - GREEN

3. B612-4 Fire Suppression System

Authorization Basis - GREEN

The applicable safety basis is the RHWM DSA for the Waste Storage Facilities. Chapter 2 of the DSA provides the description of the fire suppression systems, a dry pipe fire sprinkler system having design density of ordinary hazard group 2 meeting NFPA 13 requirements. The fire suppression system is installed in the building to control fire and to prevent fire propagation and prevent an off-site release of hazardous material that will threaten the public health, consistent with the RWHM defense in depth philosophy. Building 612-4 has a dry pipe sprinkler system meeting NFPA requirements. The building fire hazards analysis also have a more detailed description of the fire suppression system. This is a non-combustible building with no exterior wall; the building is used for storage of hazardous waste. The safety basis descriptions are adequate.

Maintenance and Work Packages - GREEN

From the review of the RHWM Maintenance Manual, Plant Engineering and Utel have maintenance responsibility for the fire suppression systems. Plant Engineering uses their "Configuration Management Plan for Fire Suppression, Detection and Alarm System" to conduct maintenance on Life Safety systems. Based on the review of the Plant Engineering Maintenance Operations Procedures MOP-00001 and MOP-164005, and Utel fire suppression systems maintenance work order for the building, the maintenance program is adequate. Dry pipe sprinkler system shop drawings are adequate.

Surveillance and Testing - GREEN

The TSR Fire Protection Program states that all fire suppression systems shall be inspected and tested based on applicable NFPA requirements. The LLNL Fire Department conducts surveillances on the fire suppression system using the LLNL Fire Department "Fire Protection and Life Safety Equipment Inspection Program", Procedure 1500. Plant Engineering conducts testing of the fire suppression systems using the above MOPs. From the records reviewed, Fire Department surveillance is adequate. From the records reviewed, Plant Engineering dry pipe sprinkler system testing records showing the static pressure of 70 and residual pressure of 70 in March and in September testing no static or residual pressure and flow test was recorded. The Fire Protection Engineers should review these results further.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to this system.

Overall - GREEN

4. B625 Fire Suppression System

Authorization Basis - GREEN

The applicable safety basis is the RHWM DSA for the Waste Storage Facilities May 2004. Chapter 2 of the DSA provides the description of the fire suppression systems, a fire sprinkler system meeting NFPA 13 requirements. The fire suppression system is installed in the building to control fire and to prevent fire propagation; this is consistent with the RWHM defense in depth philosophy. Building 625 has a sprinkler system meeting NFPA requirements. The building fire hazards analysis also have a more detailed description of the fire suppression system. This is a defense in depth system. Therefore the level of detail in the safety basis is not as it would be if it were safety significant or safety class. The safety basis descriptions are adequate.

Maintenance and Work Packages - GREEN

From the review of the RHWM Maintenance Manual, Plant Engineering and Utel have maintenance responsibility for the fire suppression systems. Plant Engineering uses their "Configuration Management Plan for Fire Suppression, Detection and Alarm System" to conduct maintenance on Life Safety systems. Based on the review of the Plant Engineering Maintenance Operations Procedures MOP-00001 and MOP-164005, and Utel fire suppression systems maintenance work order for the building, the maintenance program is adequate. Wet pipe sprinkler system shop drawings are adequate.

Surveillance and Testing - GREEN

The TSR Fire Protection Program states that all fire suppression systems shall be inspected and tested based on applicable NFPA requirements. The LLNL Fire Department conducts surveillances on the fire suppression system using the LLNL Fire Department "Fire Protection and Life Safety Equipment Inspection Program", Procedure 1500. Plant Engineering conducts testing of the fire suppression systems using the above MOPs. From the records reviewed, Fire Department surveillance is adequate. From the records reviewed, Plant Engineering wet pipe sprinkler system testing records showing the static pressure of 70psi and residual pressure of 60psi in January and in April the static pressure is 60psi however the residual pressure is still 60psi and the inspector did not seem to notice the water supply discrepancy. The Fire Protection Engineers should review these results further.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to this system.

Overall – GREEN

5. B625 Ventilation in the tent and at table-ducting, fan, HEPA Filter

Authorization Basis - GREEN

The B625 tent is discussed in the DSA Section 2.5.2. The tent is routinely used by legacy waste personnel and waste generator services personnel to open containers. It is generally operated as a Type 1 workplace although it exceeds the design requirements for a Type 1 workplace. Infrequently LLW waste that is later characterized to be TRU will be opened in the tent for operations such as lid replacement. Activities that take place in the tent include sampling, repackaging, verification and segregation. There are two separate HEPA exhaust systems, one for the tent in general (negative atmosphere), and one for point ventilation such as the work table. There are no specific controls for the 625 Tent in the TSR. The Safety basis descriptions are adequate.

Maintenance and Work Packages -

On April 29, 2004 RHWM approved the RHWM Work Permit Process. The purpose of this document is to ensure that work performed in RHWM facilities by others such as Plant Engineering is performed in accordance with RHWM requirements. The work permit process is used to accomplish this. RHWM holds a weekly planning meeting with Plant Engineering to discuss the work permits.

The RHWM Maintenance Manual was approved in 2003. This document presents RHWM's maintenance policies and procedures. The document addresses the Maintenance Implementation Plan, maintenance organization, and training of maintenance personnel, necessary equipment to perform maintenance, types of maintenance and the MEL.

Surveillance and Testing -

There have been concerns raised about operations and engineered controls in the tent and these issues are being reviewed by LLNL. Furthermore, RHWM is reviewing whether the tent is necessary, particularly now that the size reduction unit is in operation. There are no specific TSR controls for surveillance and testing of the tent.

System Operations -

There have been two DOE reportable beryllium readings in the past few years in the tent.

Overall -

6. B693 Structural System

Authorization Basis - GREEN

Chapter 2 of the DSA provides a description of the B693 structure. B693 is 130 meters from the site boundary. It is one story and is 16 feet high, 150 feet wide and 80 feet deep. The construction materials used for construction of B693 are metal for the roof, concrete block and metal for exterior walls, gypsum for interior walls, concrete for the floor, epoxy for the floor covering, and concrete for the berms. The Building 693 structure, which was constructed in 1987, is in good repair eventho one roof leak is known. B693 is a RCRA permitted facility designed to store TRU waste, TRU mixed waste, LLW mixed, LLW hazardous, California mixed (combined), flammable, PCB, asbestos, and non-hazardous wastes. B693 is a RCRA permitted facility. The safety basis descriptions are adequate.

Maintenance and Work Packages - GREEN

The TSR In-Service Inspection and Test, and Maintenance Programs, states that this program should protect design features identified in the safety analysis. The work planning packages consist of some or all of: work permit, plans discussed internally by line management, IWS, USQ, and FSP.

Surveillance and Testing - GREEN

The building inspection program includes inspections every 5 years or less by an engineer. The 2 hour fire walls are also inspected every 5 years.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to this system.

Overall - GREEN

7. B693 Fire Suppression System

Authorization Basis - GREEN

The applicable safety basis is the RHWM DSA for the Waste Storage Facilities May 2004. Chapter 2 of the DSA provides the description of the fire suppression systems. The fire suppression system is installed in the building to control fire and to prevent fire propagation. Consistent with the RWHM defense in depth philosophy, Building 693 has a sprinkler system meeting NFPA requirements. Room 1000 has a hydraulically calculated system to extra hazard group 1. In Room 1000 there is also an automatic high expansion foam fire extinguishing system that is the primary fire protection system provided for flammable waste storage. The above High Expansion

Foam system has been out of service for 2 years and foam is not present in the system or building. The building fire hazards analysis also have a more detailed description of the fire suppression system. This is a defense in depth system. The authorization basis descriptions are adequate.

Maintenance and Work Packages -

From the review of the RHWM Maintenance Manual, Plant Engineering and Utel have maintenance responsibility for the fire suppression systems. Plant Engineering uses their "Configuration Management Plan for Fire Suppression, Detection and Alarm System" to conduct maintenance on Life Safety systems. Based on the review of the Plant Engineering Maintenance Operations Procedures MOP-00001 and MOP-164005, and Utel fire suppression systems maintenance work order for the building, the maintenance program is adequate. Fire suppression shop drawings are adequate.

The USQ's for the high expansion foam system upgrade should be reviewed by LLNL ES&H Team 2 Fire Protection Engineer.

Surveillance and Testing -

The TSR Fire Protection Program states that all fire suppression systems shall be inspected and tested based on applicable NFPA requirements. The LLNL Fire Department conducts surveillances on the fire suppression system using the LLNL Fire Department "Fire Protection and Life Safety Equipment Inspection Program", Procedure 1500. Plant Engineering conducts testing of the fire suppression systems using the above MOPs. From the records reviewed, Fire Department surveillance is adequate. Plant Engineering has conducted testing of the high expansion foam system every quarter when the high expansion foam system is out of order and the system has no foam. Records of the wet pipe sprinkler system testing record show residual pressures higher than the static pressures. The Fire Protection Engineers should review these results further.

System Operations -

A review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to this system.

Overall -

8. B696 Structural System and 2 hr fire rated Portions (B696R and B696S)

Authorization Basis - GREEN

B696 actually spans two nuclear segments; a portion of the category 2 storage segment (RWSA – east side) and the category 3 B695 segment of DWTF (SWPA) west side. Building 696 is not a RCRA permitted facility, although RHWM is pursuing RCRA permit status for B696. The RWSA portion of B696, which does not have ventilation, is used for TRU storage. The RWSA consists of a portion of B696 divided into two large rooms; one for box storage and one for drum storage. The room used for drum storage is used for both short term and long term storage. The room containing boxes is used for long term storage. The SWPA portion of B696 is used for lab packing, drum crushing, waste storage and glovebox work. The Safety basis descriptions are adequate.

Maintenance and Work Packages - GREEN

The B695 Segment of the Defense Waste Treatment Facility (DWTF) TSR, In-Service Inspection and Test, and Maintenance Programs, states that this program should protect design features identified in the safety analysis.

Surveillance and Testing - GREEN

The building inspection program includes inspections every 5 years or less by an engineer. The 2 hours fire walls are also inspected every 5 years.

System Operations - GREEN

TA review of the occurrence reporting database (ORPS) has revealed no reportable occurrences relating to this system.

Overall - GREEN

9. B696 Glovebox

Authorization Basis - GREEN

The B696 glovebox is discussed in the updated DSA for the B695 Segment of the DWTF. The DSA describes the safety function, system description, functional requirements, system evaluation and TSR controls. The B696S glovebox is not in operation, but will initially be used only for LLW and mixed LLW only. An LSO approved RA is required before RHWM can declare readiness. LSO must also approve the RA before glovebox operations can commence. B696 must be RCRA

permitted which will take six to twelve months before Beryllium can be processed in the glovebox

Applicable TSR controls include; segment inventory controls, container inventory controls, ignition source controls and several programmatic administrative controls. The programmatic administrative controls include the radiation protection program and minimum staffing requirements. The Safety basis descriptions are adequate.

Maintenance and Work Packages - BLACK

In the B695 Segment of the DWTF DSA Section 12.3 development of procedures and maintenance of procedures is discussed. In the B695 Segment of the DWTF DSA the maintenance program is discussed.

Surveillance and Testing - BLACK

Prior to operation of the B696 glovebox, a RA-2 needs to be performed which will involve a review of the equipment. Radiation Protection evaluation and/or monitoring will be required to operate the glovebox.

System Operations - BLACK

Prior to operation of the B696 glovebox, a RA-2 needs to be performed

Overall - BLACK

10. B695 Structural System

Authorization Basis - GREEN

The B695 structure is discussed in Section 2.4 of the October 2004 695 segment DSA. B695 is used as a liquid and solid waste treatment facility. The structure itself is not used as part of operations, except as secondary containment in some areas, and to protect personnel, equipment and waste from the elements. B695 was designed in accordance with DOE-STD-1020-94. It meets PC-2 criteria. Seismic analyses were performed using Static Force Method, using peak ground acceleration of 0.57g. The safety basis descriptions are adequate.

Maintenance and Work Packages - GREEN

On April 29, 2004 RHWM approved the RHWM Work Permit Process. The purpose of this document is to ensure that work performed in RHWM facilities by others such as Plant Engineering is performed in accordance with RHWM requirements. The work permit process is used to accomplish this. RHWM holds a weekly planning meeting with Plant Engineering to discuss the work permits.

The RHWM Maintenance Manual was approved in 2003. This document presents RHWM's maintenance policies and procedures. The document addresses the Maintenance Implementation Plan, maintenance organization, and training of maintenance personnel, necessary equipment to perform maintenance, types of maintenance and the master equipment list.

Surveillance and Testing - GREEN

The structure is inspected every 5 years according to the 695 segment TSR December 2004. Recently due to a water leak portions of the 695 lobby ceiling collapsed. However, facility staff walk-through the building on a daily basis, including weekends, to look for leaks and significant structural deficiencies.

System Operations - GREEN

A review of the occurrence reporting database (ORPS) revealed no reportable occurrences relating to this system.

Overall - GREEN

11. MOVER Glovebox

The MOVER glovebox has been out of operation since the August 2004 incident involving release of radioactive material.

Overall – N/A

12. MOVER Glovebox Operation Structure

The MOVER glovebox has been out of operation since the August 2004 incident involving the release of radioactive material.

Overall – N/A

13. TRU Waste Containers (vents)

Authorization Basis - GREEN

TRU waste containers are discussed in all 3 RHWM DSAs; the TRU Waste Segments DSA, storage DSA & 695 segment of DWTF DSA. TRU waste containers are used for storage of TRU and TRU mixed waste onsite. The TRU containers are placed into TRUPACT containers for shipment offsite. The TRU waste containers are

adequately inspected at the purchase and acceptance stages. The site wide packaging procedures are adequate to ensure operability. TRU containers that are unvented are stored in TRU boxes. Chapter 3 of the Waste Storage Facilities DSA in Section 3.3.2.3 addresses changing of a drum lid on a drum of LLW determined to be TRU with a vented lid. The Waste Storage Facilities (WSF) TSR 5.6.4 describes the TRU waste container management program. The safety basis descriptions are adequate.

Maintenance and Work Packages - GREEN

In the TSRs for WSF, Section 5.5.2 requires that all TRU waste shall be stored in approved waste containers. The TRU Waste Containers are highly controlled through procurement and their operational life cycle. Typically damage to a drum will result in replacement rather than maintenance. Change control is required through the Packaging and Transportation Quality Assurance Plans which do not allow modifications to the drums without authorization.

Surveillance and Testing - GREEN

The TRU waste container maintenance program involves weekly inspections for rusting, corrosion, damage, denting, swelling, and damage to filter vents. The procedures reviewed were adequate to ensure these inspections were completed. Additionally, procedures are established for inspection upon receipt (prior to being placed in service) and while the drums are in their operational life cycle.

System Operations – GREEN

This VSS is a passive SSC and the programs and infrastructure developed by LLNL on packaging is sufficient to ensure continued operability.

Overall - GREEN

Attachment 3

Configuration Management for VSS
Lines of Inquiry

Configuration Management Criteria:

1. Technical, functional, and performance requirements for the systems are identified in the authorization basis documents. These documents identify and describe the system safety functions.
2. Items and processes are designed using sound engineering/scientific principles and appropriate standards
3. The adequacy of design products are verified or validated by individuals or groups other than those who performed the work. Verification and validation is completed before approval and implementation of the design.
4. Changes to system requirements, documents, and installed components are designed, reviewed, approved, implemented, tested and documented in accordance with formally controlled procedures.
5. Facility procedures ensure that changes to the system requirements, documents and installed components are adequately integrated and coordinated with those organizations affected by the change.

Lines of Inquiry:

AB Documentation

1. Do Authorization basis documents identify and describe the safety system functions?
2. Do the definition/description of the safety functions of the system include:
    a. Specific roles of the system in detecting, preventing or mitigating analyzed events?
    b. The associated conditions and assumptions concerning system performance?
    c. System requirements and performance criteria for the system and active components including essential supporting systems for normal, abnormal, and accident conditions relied upon in the hazard or accident analysis?
3. Have technical and administrative design interfaces been identified and methods been established for their control
4. Has the completed design been recorded in design output documents, such as drawings, specifications, test/inspection plans, maintenance requirements and reports?
5. Have as-built drawings and shop drawings been maintained after production or construction to show actual configuration?

Walkdown and Verification/Validation

1. Are materials and installation of system components consistent with the requirements and performance criteria for the system, including quality controls and quality assurance?
2. Are system components properly labeled to assure proper configuration and operation?
3. Do identified discrepancies potentially impact (10 the operability or reliability of the system; or (2) the adequacy of the change control or document control processes applied to the system (e.g., presence of unauthorized changes or failure to properly document authorized changes)?

Change Process

1. Are changes to the system reviewed to ensure that system requirements and performance criteria are not affected in a manner that adversely impacts the ability of the system to perform its intended safety function?
2. Are installation instructions and post-modification testing instructions and acceptance criteria appropriately specified?
3. Are safety basis and design documents affected by the change revised, as appropriate?
4. Has the responsible contractor organization assigned an appropriately qualified cognizant system engineer for the system?

Maintenance and Work Packages Criteria:

1. For the system, maintenance processes consistent with safety classification are in place for corrective, preventive, or predictive maintenance, to manage the maintenance backlog.
2. The system is periodically inspected in accordance with maintenance requirements to assess its material condition.
3. Requirements are established for procured items and services and items and services perform as specified.
4. Processes are established and implemented that ensure that approved suppliers continue to provide acceptable items and services.

Lines of Inquiry:

1. Does maintenance for the system satisfy system requirements and performance criteria in safety basis documents or other site maintenance requirements?
2. Are conditions that require component replacement identified?
3. Has the system been evaluated for potential inclusion of SCI parts?
4. Is the systems inspected periodically according to maintenance requirements and are deficient conditions evaluated and or corrected?
5. Has preventive maintenance been performed as prescribed?
6. Is there an accurate maintenance history that compiles maintenance, resources...?

Inspection Procedures

1. Do personnel performing inspections understand operational features, safety requirements and performance criteria for the system?
2. Are conditions adequately evaluated to ensure the system is capable of performing its safety-related functions?
3. Are critical or important acceptance parameters and other requirements, such as inspection/test equipment or qualified inspection/test personnel, specified in design documentation?
4. Are installation instructions and post-modification testing instructions and acceptance criteria appropriately specified?
5. Are inspections and test performed to verify that physical and functional aspects of items, services, and processes meet requirements and are fit for use and acceptance?

Surveillance and Testing Criteria:

1. Surveillance and testing of the system demonstrates that the system is capable of accomplishing its safety functions and continues to meet applicable system requirements and performance criteria
2. Surveillance and test procedures confirm that key operating parameters for the overall system and its major components remain within safety basis and operating limits
3. The acceptance criteria from the surveillance tests used to confirm system operability are consistent with the safety basis
4. Instrumentation and measurement and test equipment for the system are calibrated and maintained

Lines of Inquiry:

1. Does the procedure contain instructions to perform the test successfully and assure validity of test results?
2. Are key parameters used to verify that system performance meets system requirements and performance criteria appropriate for the current mission?
3. Can parameters that demonstrate compliance with the safety basis be measured or physically verified?
4. Does the system design include provisions necessary for conducting the tests? Are limits, precautions, system and test prerequisite conditions, data required, and acceptance criteria included?
5. Is there a clear linkage between the test acceptance criteria and the safety documentation, and are the acceptance criteria capable of confirming that safe/operability requirements are satisfied?
6. Was the test equipment used for the surveillance calibrated?

System Operations Criteria:

1. System operating procedures are technically accurate and operations personnel are knowledgeable of system design requirements, in accordance with the facilities safety basis.
2. Procedures are technically accurate to achieve required system performance for normal, abnormal, remote shutdown, and emergency conditions.
3. Operations personnel are trained on proper system response, failure modes, and required actions involved in credible accident scenarios in which the system is required to function.

Lines of Inquiry:

1. Is the system operated in accordance with the system design
2. Is the indication available to operate the equipment in accordance with applicable operating procedures and instructions?
   Are the environmental conditions assumed under accident conditions adequate for remote operation of the equipment?
3. Are support systems and procedures adequate to support the system during event sequences that it is design to initiate?

Attachment 4

References

1. Letter dated December 12, 2003 (Hill/Fisher), "LLNL Configuration Management Program"
2. Letter dated February 3, 2004 (Fisher/Hill), "Status of LLNL Configuration Management Program"
3. Letter dated November 3, 2004 (Conway/Abraham), "DNFSB 60-Day Reporting Request for Configuration Management"
4. Letter dated November 9, 2004 (Yuan-Soo Hoo/Shotts), "Lawrence Livermore National Laboratory Configuration Management Program"
5. Lawrence Livermore National Laboratory Defense Nuclear Facilities Safety-Class and Safety Significant - Defense in Depth, Vital Safety System List - November 15, 2004
6. DOE O 433.1, "Maintenance Management Program for DOE Nuclear Facilities"
7. DOE-STD-1073-2003, Configuration Management Program
8. Lawrence Livermore National Laboratory Environment Safety & Health Manual
9. DOE/University of California Contract, LLNL, No. W-7405-Eng-48
10. DOE/OA-40 – "Independent Oversight Inspection of Environment, Safety and Health Management at the LLNL", November 2004
11. "Model Assessment Criteria and Guidelines for Performing Phase II Assessments of Safety Systems at Defense Nuclear Facilities", November 2001
12. "Department of Energy, National Nuclear Security Administration Livermore Site Office Evaluation of Lawrence Livermore National laboratory Configuration Management In Building 332", January 2005

Documents

1. Packaging and Transportation Safety (PATS) Program Office Specifications for TRU-Waste Drums with Poly Bag Liner, Revision 9 - January 27, 2004
2. Nuclear Filter Technology Product Specification Data Sheet (NFT019DS) - "NucFil 019DS ventilation filer with sample port
3. Nuclear Filter Technology Drawing - #0519004, "019 Direct Sample Assembly"
4. PuFO99-102 mpm, dated July 21, 1999, Memorandum of Understanding between Nuclear Material Technology Programs (NMTP) and Plant Engineering (PE)
5. Hardened Engineering Test Building- Building 334 Safety Analysis Report, UCRL-AR-123109-03, April 2003
6. Hardened Engineering Test Building- Building 334 Technical Safety Requirements, UCRL-AR-132955-03, April 2003
7. LSONST: 030050 Approval of the Building 334 (B334) Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR), October 06, 2003.
8. USQD-B334-03-007D Review of new SRPs (SRP-334-001, SRP-334-002, and SRP-334-003), for the 10 CFR 830 compliant B334 SAR Implementation.
9. USQD-B334-03-006D Review of new ACPs (ACP-334-001 and ACP-334-002) for the 10 CFR 830 compliant B334 SAR Implementation.

10. USQD-B334-02-003D Replacement of the existing HEPA filter plenum with a new plenum manufactured by Flanders.
11. USQD-B334-04-004D "Like-in-kind Determination for NMTP Facilities Replacement/Spare items, Including Requirements for Procurement and Acceptance" Revision 0.
12. ACP-334-002, R0- Annual Visual Inspection of Building 334 High Bay Structure and Exterior Exit Door Seals, November 21, 2003.
13. SRP-334-001, R0- Surveillance Requirement Procedure SR 4.1.1 Quarterly, Check HEPA Filter Pressure Differential, November 21, 2003.
14. SRP-334-002, R0- Surveillance Requirement Procedure SR 4.1.2 Annual, HEPA Filter In-Place Leak Test.
15. SRP-334-003, R0- Surveillance Requirement Procedure SR 4.1.3 Annually, Inspect Safety- Significant Ducting, November 21, 2003.
16. Facility Safety Plan for Building 334 Rev 1, December 2003
17. Nuclear Material Technology Program, Category 3 Nuclear Facilities and the Superblock Yard, Work Control Manual, NMTP-DOC-001, October 2003.
18. Integration Work Sheet No. 2781, removal of ventilation, ducting, piping, HEPA filters and associated equipment from building 334 room 3001, 11-13-2002.
19. Integration Work Sheet No. 3407.01, B334 HEPA Filter Replacement, 01/10/2003.
20. Health Physics Discipline Action Plan, HP-16-W, Continuous Air Monitor, April 29, 2002.
21. Lawrence Livermore National Laboratory Environment Safety & Health Manual (Building 334 Maintenance Implementation Plan June 14, 2004)
22. B251, Safety Analysis Report (SAR), dated April 1, 2003, UCRL-AR-113377 Rev 2
23. Technical Safety Requirements for Building 251 Heavy Element Facility, dated January 2004, UCRL-AR-145640, Rev 4
24. Maintenance Procedure 251-MNT-104, Verifying Functionality of the Glove box Alarm Systems Located in the Fan Control Panels of the Non-upgraded Area
25. Maintenance Procedure 251-MNT-105, Verifying Pressure Differential as Read on the Glove Box Exhaust Differential Pressure Magnehelic
26. Maintenance Procedure 251-MNT-106, Final Stage HEPA Filter in-place Leak Tests
27. Maintenance Procedure 251-MNT-108, B-251 HEPA Filter Replacement
28. Maintenance Procedure 251-MNT-110, Magnehelic/Photohelic Gage Replacement
29. Maintenance Procedure 251-MNT-117, Perform Hood Survey to Establish Satisfactory Status
30. Form 251-FRM-112, Rev 2, Room Exhaust Verification
31. Form 251-FRM-113, Rev 3, Fume Hood Functionality Checklist
32. Form 251-FRM-121, HEPA filter replacement worksheet
33. Form 251-FRM-122, Status of B-251 HEPA Filters
34. 251-OPS-110, Rev 2, Room Exhaust Differential Pressure Check
35. 251-OPS-127, Rev 1, Verify Fume Hood Sash/Fan Speed and Air Flow
36. B251-02-011, Heavy Element Facility Calibration Program for Building 251 Measuring and Test Equipment
37. Administrative Procedure 251-ADM-013, TSR, Implementation, Verification, and Documentation
38. Administrative Procedure 251-ADM-118, Perform Inspections to Ensure the Mosler

Safes Containing Radioactive Materials are Closed

39. Administrative Procedure 251-ADM-119, B251 Graded Approach Form for Measuring & Test Equipment
40. Underground Storage Vault Access Procedure 251-TIP-106
41. B251 Data Sheets for CM Program (performed by system engineer)
42. Work Order task codes for B251:
    a. HV -71 for ATS 02 GDE -02 for Jan to Dec 2004
    b. HV -64 for ATS 01 GDE -03&GDE-44 for Jan to Dec 2004
    c. HV -72 for GDE -02 for Jan to Dec 2004
    d. HV -72 for GDE-03 for Jan to Dec 2004
    e. HV -69 for GDE -02 for Aug 2004
    f. HV -69 for GDE-03 for Aug 2004
    g. HV -02 for GDE-44 for Aug 2004
    h. HE -72 for GDE-02/GDE-3 for Jan to Dec 2004
    i. HE -50 for GDE-44 for Jan to Aug 2004
43. Plans for B251:
    a. PLM91-251-002D Emergency Generator Exhaust Stack Extension
    b. PLE92-251-001DB Remote Emergency Generator Stop
    c. PLE94-251-001D B251 (251-GDE-01) modification of 150kw mg set to automatic control
    d. PLE94-251-002D B251 (251-GDE-02) Emergency Generator Control Panel
    e. PLE94-251-003D B251 (251-GDE-02) Emergency Generator Control Panel
    f. PLE94-251-004D B251 (251-GDE-02) Emergency Generator Control Panel
    g. PLE94-251-005D B251 (251-GDE-01) Modification of 150kw mg set to automatic control
    h. PLE94-251-006D Wiring Diagram and Control Panel Detail
    i. PLE94-251-007D B251 (251-GDE-01) Modification of 150kw mg set to automatic control
    j. PLE94-251-008D B251 (251-GDE-01) Modification of 150kw mg set to automatic control
    k. PLE95-251-001D B251 Emergency Generator 251-GDE-03
    l. PLE95-251-002D B251 Emergency Generator 251-GDE-03
    m. PLE95-251-003D B251 Emergency Generator 251-GDE-03
    n. PLE96-251-001D Site 200 SCDA Generators
44. USQD B251-03-046-E, Rev. 1 of 5/20/04
45. UCRL-AR-133354 (Rev.2), HEPA Filter and In-place Leak Testing Standard, April 2003
46. Data Sheet for B251 CM Program: Room Exhaust Systems dated December 20, 2004
47. Data Sheet for B251 CM Program: Glove Box (GBE) OAK-LLNL-LLNL-2001-0032 Exhaust Systems dated December 20, 2004
48. Data Sheet for B251 CM Program: Fume Hood Room Exhaust Systems dated December 20, 2004
49. Occurrence Reports:
    a. OAK-LLNL-LLNL-2001-0032
    b. OAK-LLNL-LLNL-2003-0019
    c. OAK-LLNL-LLNL-2004-0065

d. OAK-LLNL-LLNL-2005-0002

50. Building 251 Fire Suppression System Back up Water Tank PM Task Rev 10/99, PM dated 10/29/04.
51. Building 251 Wet Pipe Sprinkler System Annual PM, dated 05/13/04
52. Data Sheet #1 for Building 251 CM Program Rev.2, dated 03/15/04
53. Fire Sprinkler and Water Storage Tank drawings for B-251, varies dates from 1963 to 1980.
54. LLNL Fire Department Building Inspection History Report for B-251, dated 01/28/05.
55. Technical Safety Requirements for the Waste Storage Facilities August 2004 UCRL-AR-202307 Rev.1
56. Updated Documented Safety Analysis for the B695 Segment of the Decontamination and Waste Treatment Facility October 2004 UCRL-AR-149550, Rev.2
57. Documented Safety Analysis for the TRU Waste Segments of the Decontamination and Waste Treatment Facility November 2003 UCRL-AR-152931 Rev. 1
58. UCRL-AR-202270, Documented Safety Analysis for the Waste Storage Facilities May 2004
59. B695 Segment of DWTF TSR UCRL-AR-150153 Rev. 2 December 2004
60. Configuration Management Plan for Fire Suppression, Detection and Alarm Systems that are Life Safety, dated 01/08/2003
61. USQ Determination Worksheet, USQ # 693-04-239
62. USQ Determination Worksheet, USQ # 693-05-009
63. Building 693 High Expansion Foam Fire Suppression System Technical Requirements, dated 7/30/2004
64. RHWM Wet Pipe Sprinkler system Annual PM Procedure dated 08/23/2004
65. RHWM Dry Pipe and Pre-action Sprinkler Quarterly PM Procedure, dated 08/23/2004
66. Draft B-693 High Expansion Foam Fire Suppression System Testing Protocol, dated 01/19/2005
67. LLNL Fire Department Fire Protection and Life Safety Equipment Inspection Program 1500, dated 11/11/2004
68. Varies Utel Fire Suppression systems work order/PM from B- 625, 612, 612-A, 693, for 2004.
69. Radioactive and Hazardous Waste Management Maintenance Manual, dated July, 2003
70. RHWM Nuclear Facility Configuration Management Program, Rev 2, dated August 2004
71. RHWM Configuration Management Implementation Plan/Report, Rev 2, September 2004
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74. Radiography Facility - Building 239 Safety Analysis Report, 10 CFR 830 Compliant Documented Safety Analysis, UCRL-AR-147501-03, dated February 2003
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78. SRP-239-003, "Surveillance Requirement Procedure SR 4.2.1, Semi-Annual, RAMS and Associated Warning Light Inspection", dated October 7, 2003
79. SRP-239-004, "Surveillance Requirement Procedure SR 4.2.1, Annual, RAMS Test and Recalibration", dated October 7, 2003
80. Facility Safety Plan for Building 239, dated February 2004
81. LLNL ES&H Manual, Document 52.1, Appendix B.7, "Building 239 Maintenance Implementation Plan" dated June 14, 2004
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