Department of Energy
National Nuclear Security Administration
Washington, DC 20585

January 4, 2005

OFFICE OF THE ADMINISTRATOR

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W.
Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

The Secretary has requested that I forward this interim response to your November 3, 2004, letter regarding the implementation status of Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, at the Lawrence Livermore National Laboratory (LLNL). Your letter noted several occurrences involving the inadequate condition of safety systems, including covers (tape) for safety-class ventilation duct penetrations, potential cracking in safety-significant ventilation duct welds, and inadequate seismic restraints for safety-significant gloveboxes. Specifically, you requested from DOE a report within 60 days that addresses:

- 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.

The Livermore Site Office (LSO) chartered a review team to evaluate the institutional application of configuration management within Building 332, including specific vital safety system reviews. The review team performed document reviews, walkdowns of specific Building 332 vital safety systems, and held discussions with systems engineers, facility and operations personnel, and safety basis personnel.

The review team's enclosed report addresses the specific actions taken or compensatory measures implemented to address the condition of the safety systems noted in your letter. In addition, the report identifies or confirms serious vulnerabilities in the configuration management program at the institutional level and in the majority of the reviewed vital safety systems within Building 332. The enclosed LSO report concludes that configuration management is not complete or effective within Building 332. In addition, the team noted that the commitment to institutionalize the DOE Phase II assessments in response to DNFSB Recommendation 2000-2 has not been satisfied, and there are no institutional assessments of vital safety systems being performed in LLNL's defense nuclear facilities.

Regarding the potentially cracked ducting in Building 332, LSO will direct LLNL to perform non-destructive testing as necessary to verify the existence of cracks. If testing confirms the presence of cracks in the ducting, LLNL will follow the unreviewed safety question determination process.

Based on the team's findings, NNSA accepts LSO's recommendation to expedite performance of comprehensive Phase II assessments for all vital safety systems in Building 332, with first priority on the fire suppression system and gloveboxes. In addition, NNSA agrees that LSO will work jointly with LLNL to reassess LLNL's institutional configuration management program, consistent with relevant Phase II assessment guidance.

LSO will provide its Building 332 assessment results to LLNL by January 3, 2005. LLNL has been directed to submit a resource-loaded corrective action plan for Building 332 to LSO by March 3, 2005. NNSA has directed LSO to complete the remaining vital safety system reviews no later than March 2005. Subsequently, LLNL corrective action plans will be submitted to LSO within 60 days after receipt of subject assessments. Upon completion of all LSO assessments and LLNL corrective action plans, LSO will direct LLNL to develop a comprehensive resource loaded schedule for a fully implemented configuration management program for the defense nuclear facilities.

I share your concern regarding the adequacy of the configuration management program in Building 332. A full response to your letter, including the resource loaded schedule for implementing a configuration management program for vital safety systems at LLNL's defense nuclear facilities, will be provided to the Board following LSO's completion of their assessments and LLNL's identification of all necessary corrective actions.

Sincerely,

Linton F. Brooks
Administrator

cc: M. Whitaker, DR-1

Department of Energy

National Nuclear Security Administration

Livermore Site Office

Evaluation

Of

Lawrence Livermore National Laboratory

Configuration Management in Building 332

Executive Summary

The National Nuclear Security Administration/Livermore Site Office (NNSA/LSO) chartered a review team to evaluate the institutional application of configuration management within Building 332, including specific Vital Safety System (VSS) reviews. The team consisted of the Building 332 Facility Representative, the Superblock Operations Team Leader, the Principal System Engineer, and the LSO Configuration Management Program Manager. The NNSA/LSO evaluation of configuration management of VSS within Building 332 used criterion based on the methodology used by the Office of Independent Oversight and Performance Assurance (OA-40) in their recent review of Essential Safety Systems and DOE-STD-1073-2003, Configuration Management Program. The team performed document reviews, walkdowns of specific B332 VSS, discussions with systems engineers, facility and operations personnel, and safety basis personnel. Additionally, the team reviewed past assessments for information on the status of the LLNL institutional configuration management program.

This review concluded that configuration management (CM) is not complete or effective within Building 332. The application of configuration management to the vital safety systems is also not complete and vulnerabilities exist. Additionally, the institutional infrastructure necessary for a successful CM program is clearly deficient. This is evident from several LLNL directorates indicating that there is a lack of senior management priority and emphasis on the CM program; therefore, resulting in inadequate funding and resources dedicated to implementation.

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

While evaluating the B332 VSS, documents and drawings were reviewed to understand what the systems entail. Many of the systems are not defined well enough to understand the system boundaries including 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, documenting and controlling these interfaces.

The review also concluded that the safety basis for B332 lacks a strong technical basis for the VSS. Due to an inadequate technical baseline it is difficult to determine if a change would result in operating outside of the authorization basis. It is unclear if change control, including the Unreviewed Safety Question (USQ) process, is being implemented properly within B332. The Unreviewed Safety Question Determination (USQDs) reviewed during this evaluation were lacking in detail to allow the reviewer to fully understand the change and conclusions.

Finally, it was also noted that outdated implementing documents exist including technically inaccurate procedures and documents past revision review dates.

NNSA/LSO recommends that comprehensive Phase II assessments be performed for all of the Vital Safety Systems in Building 332, with the fire suppression system and gloveboxes being the initial systems reviewed. These Phase II assessments should be performed using the objectives of the "Model Assessment Criteria and Guidelines for Performing Phase II Assessments of Safety Systems at Defense Nuclear Facilities", November 2001.

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). This approach is for an evaluation of configuration management based on an institutional review of the configuration management program and evaluation of the LLNL Building 332 VSS. The commitment to provide a resource-loaded schedule for implementing a configuration management program for vital safety systems will be addressed once all of the defense nuclear facility vital safety systems reviews and corrective action plans are complete.

II. Purpose and Scope

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

- The LLNL institutional configuration management program in B332; and
- The LLNL Building 332 VSS

In addition this evaluation reviewed the status on the three specific LLNL Building 332 VSS issues noted in the DNFSB letter and they are as follows:

Inadequate Covers on Ventilation Duct Penetrations

LLNL declared the discovery of the inadequate covers a discrepant as found condition on September 22, 2004. After an emergency work request was completed, facility workers completed repairs (installed plugs) on the ducting by the following day.

Potential Cracked Ducting in Room 1321

LLNL originally submitted an ORPS report (LLNL-2004-0040) on September 1, 2004 declaring the potential cracked ducting a "management concern". LSO issued a letter on October 8, 2004 (LSONST: 040064), instructing the lab to declare a Potential Inadequate Safety Analysis (PISA) because LSO believed that the potential

cracking was a discrepant as found condition that could affect the safety basis. The ORPS report was updated on October 14, 2004, declaring a PISA.

LLNL submitted a letter to LSO on November 22, 2004, stating that if non-destructive evaluation (NDE) shows that these potential cracks are indeed cracks then a positive USQD would be declared. Currently, LLNL has instituted compensatory measures including surveillances and installation of cuffs. LLNL has requested approval from LSO to remove the cuffs in order to perform NDE to verify the existence of cracks. The LSO approval letter is in concurrence this week.

Inadequate Seismic Restraints for Safety Significant Gloveboxes

LLNL submitted an occurrence report (OAK-LLNL-LLNL-2004-0024) on June 18, 2004 declaring a performance degradation of a safety-significant SSC. The basis for filing this occurrence report was due to inadequately designed seismic restraints that were used to secure a glovebox to the floor in a laboratory. The ORPS report was for two gloveboxes within B332, one of which was inactive. An inspection of seismic restraints installed on all gloveboxes was completed several years ago; however, all gloveboxes that were installed after completion of this prior inspection were assessed to ensure that the seismic restraints were adequate. The restraints have been replaced and the facility has verified that all other gloveboxes in the facility are not affected. There will be a Final ORPS report in late January.

III. Evaluation Activities

LLNL Institutional Configuration Management Evaluation:

NNSA/LSO Configuration Management Program Manager performed an evaluation of the institutional application of configuration management at LLNL. This review consisted of evaluating compliance with the DOE/University of California (UC) Contract requirements, LLNL ES&H Manual Part 41, Document 41.2 "*Configuration Management Program Description*", LLNL Configuration Management Plan, and each LLNL Directorate Configuration Management Plan. Discussions were held with System Engineers, Associate Directors, Assurance Managers and operations personnel. Results from this review are provided in this evaluation report specific to B332.

This evaluation has resulted in further correspondence to LLNL from LSO directing additional activities. Additionally, NNSA/LSO is recommending that the LLNL Institutional Configuration Management Program be reassessed by a cross organizational team using the above mentioned Phase II guidance.

LLNL Building 332 VSS Evaluation:

NNSA/LSO performed an evaluation of the LLNL Building 332 VSS. 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. This evaluation consisted of reviewing compliance with the DOE/UC Contract requirements, LLNL ES&H Manual Documents 41.2 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 seventeen (17) Building 332 VSS listed in the "Lawrence Livermore National Laboratory Defense Nuclear Facilities Safety Class and Safety Significant – Defense in Depth Vital Safety System List", dated November 15, 2004 (Attachment 1) are:

- Final HEPA filtration stages – Safety Class (SC)
- Room ventilation system (Increments 1 & 3) – SC
- Glovebox exhaust system – SC
- Downdraft exhaust ventilation system – SC
- Gloveboxes – Safety Significant (SS)
- B332 Structure – SC
- Fire Detection and Suppression System – SC
- Fire Alarm and Detection – SS
- Emergency Electric Power – SC
- Continuous Air Monitoring – SS
- Criticality Alarm System – SS
- Glovebox Nitrogen Supply System – SS
- Hydrogen Gas System – SS
- Glovebox Argon Supply System – SS
- Toxic Gas Monitor and Alarm System – SS
- TRU Waste Containers (Vents) – SS
- Emergency Battery Lights – Defense in Depth (DID)

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 team consisted of the Building 332 Facility Representative, the Superblock Operations Team Leader, the Principal System Engineer, and the Configuration Management Program Manager. The team was chosen based on their knowledge of B332 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 1). 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 evaluation did take credit for the VSS' that were reviewed in the

recent OA-40 assessment. However, the team still further evaluated these systems as appropriate.

The lines of inquiry focused on four specific elements of configuration management that were applied to each B332 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. (See Attachment 2).

This stoplight rating system:

BLACK – non-existent
RED – significant deficiencies

GREEN – Compliant

IV. EVALUATION RESULTS

The results will be presented for each of the separate evaluations: LLNL Configuration Management Program (with specifics on the Defense and Nuclear Technology Directorate); and the B332 Vital Safety Systems.

LLNL Configuration Management Program Evaluation

The NNSA/LSO transmitted a letter to LLNL in December 2003 that expressed concern on the implementation of the configuration management program. This letter requested several items including the status of implementation in all directorates, funding profiles, gap closures and an updated implementation schedule. A February 2004 response from LLNL indicated appropriate responses and actions would be taken to address the LSO letter; however to date a revised implementation schedule with funding profiles has not been developed and provided to LSO. This resulted in LSO conducting an evaluation of the LLNL Configuration Management (CM) Program in 2004. The evaluation consisted of reviewing each directorate's configuration management plan, implementing documents and discussions with directorate personnel.

LSO concluded that several organizations within directorates were making good progress towards fully implementing and institutionalizing configuration management; however this represented a very small sector of LLNL. Several

directorates indicated that there was a lack of senior management priority and emphasis on the CM program therefore resulting in inadequate funding and resources dedicated to implementation. The conclusion was that CM implementation was stalled within almost all organizations.

Additionally, this assessment noted that the commitment to institutionalize the DOE Phase II assessments (DNFSB Recommendation 2000-2) had not been satisfied. There were no true institutional Vital Safety System assessments being performed in the defense nuclear facilities. Additionally, the guidance for performance of these assessments was inconsistent across the directorates.

LLNL has begun a project to recreate and update as-built drawings which is progress; however, the pace does not support configuration management system needs in the short term.

Specific Defense and Nuclear Technology (DNT) Directorate (includes B332) issues concerned the lack of funding needs (identified at over 20 million for the next 7 years to fully implement configuration management), inclusion of Nevada facilities owned and operated by LLNL, and the potential for design validation activities that were not considered in the original scope of configuration management implementation. The review did note that DNT, including B332, had begun an aggressive implementation of the System Engineering program including assignment of system engineers to VSS and system walkdowns.

The overall conclusion of this assessment was that the LLNL configuration management program was noncompliant with the requirements and not being implemented within defense nuclear facilities to ensure reliable vital safety systems.

Findings:

1. **LLNL must revisit the guidance in the ES&H Manual concerning the institutionalized vital safety system assessments. The criteria used should ensure the Phase II CRAD objectives are met and allow for a graded approach in appropriate situations. LLNL must schedule these assessments for all VSS safety systems.**

2. **LSO must develop a schedule for the Safety System Oversight (SSO) personnel performance of appropriate assessments of the VSS that also reflect the Phase II CRADS objectives.**

3. **The LSO/LLNL VSS Listing must be put under a more formal and rigorous change and document control system to ensure that changes are agreed upon and that the listing reflects the authorization basis requirements.**

B332 Vital Safety System Evaluation

The B332 VSS assessment concluded that there are common deficiencies throughout the systems. NNSA/LSO recognizes that the draft Documented Safety Analysis (DSA) for B332 addresses some of the deficiencies; however, until the draft DSA is approved, the issues are still outstanding. Specifics are included in Attachment 3. Below is a summary of the common deficiencies with specific findings bolded.

With few exceptions, the Vital Safety Systems for B332 do not have up to date drawings, Piping and Instrumentation Diagrams (P&IDs), or the necessary as-builts. B332 has a project to develop, update or revise drawings for the VSS; however, the breadth of this activity is of such a magnitude that not much progress has been made. B332 must first baseline each system's needs for drawings and then projectize this activity in order for it to be completed appropriately.

> **Nuclear Materials and Technology Program (NMTP), B332 line management, must baseline the status of drawings needs for each vital safety system and projectize the path forward to ensure these drawings are completed, revised and updated appropriately and accurately.**

When evaluating the Vital Safety Systems, many documents and drawings were reviewed to understand what the systems entail. Many of the systems are not defined well enough to understand what the system boundaries are. This includes 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, documenting and controlling these interfaces.

> **NMTP must adopt a consistent approach to defining, documenting and controlling the vital safety system boundaries and interfaces, including system design descriptions.**

> **NMTP must document the boundaries and interfaces within the safety basis and clearly mark on system diagrams and drawings.**

There is not a full understanding, identification and labeling of system components for the vital safety systems. The vital safety systems are not defined to a depth to fully understand what the critical components are that must also be considered, analyzed and under change control to ensure operability. The "*Defense & Nuclear Technologies Directorate, Plutonium Facility – Building 332, Maintenance and Operations Manual*", October 1999, Revision 1 contains in Appendix A the Plutonium Facility Master Equipment List (MEL) which applies to the Building Safety Systems (BSSs) which include both the safety class and safety significant structures, systems and components. However, the listing does not contain detail enough to understand what the critical system components are for the VSS and if all

are identified. Additionally, this document is five (5) years old; however it has been recently updated but not formally approved.

The B332 VSS must be appropriately assessed to identify the critical components of the system.

The B332 Maintenance and Operations Manual, UCRL-MA-127630 Revision 1, needs to be reviewed and revised including the MEL. The MEL must be revised to clearly identify the components critical to the operability of the each B332 VSS.

The safety basis for B332 lacks strong technical bases for the VSS. There is not enough detail to fully understand the system requirements (including design), required safety functions, functional requirements, operational limitations, system parameters, performance expectations, and abnormal operations. The lack of this information makes it difficult to develop appropriate operational (both abnormal and normal) procedures, maintenance needs, surveillance requirements, and limiting conditions of operation.

The B332 safety basis must be revised to clearly discuss the VSS' technical bases. This includes system and design requirements, system parameters, performance expectations, operational limitations, safety functions and functional requirements.

When the above information is developed and documented appropriately, B332 should review all implementing documentation to ensure they support the assumptions and requirements of the system.

LLNL committed to formally institutionalizing the DOE Phase II Assessments that were utilized to address DNFSB Recommendation 2000-2. The ES&H Manual, Documents 41.2 and 50.1, discuss these assessments which are used to reconfirm the configuration management of the vital safety systems. Building 332 cannot demonstrate the performance of the assessments defined in the ES&H Manual Documents noted above.

Building 332 must begin performance of the LLNL Institutional VSS Assessments as provided for in ES&H Manual Document 41.2 and 50.1. The NMTP assessment schedule should ensure that an appropriate number are performed annually to provide a level of confidence in the continued implementation of configuration management for the VSS.

With the exception of few, the periodic assessments required by DOE O 433.1, Maintenance Management Program for DOE Nuclear Facilities, are not being performed by B332 for the VSS. These periodic assessments are defined as "…inspections of SSCs and equipment required to determine whether degradation or technical obsolescence threatens performance and/or safety…"

NMTP must schedule and begin performance of required DOE O 433.1 assessments.

During the review of the B332 VSS, the reviewers noted a number of out of date, past revision and inaccurate implementing documents. These documents included the Surveillance Requirement Procedures, Administrative Controls Procedures, and Plant Engineering Task Codes. Additionally, the Plant Engineering Task Codes do not denote that Facility management has reviewed and approved them and that changes made are per the Memorandum of Understanding (MOU) between Nuclear Materials Technology Program (NMTP) and Plant Engineering (PE).

NMTP must review all implementing documents including operating procedures, surveillance and maintenance procedures, and other VSS support documentation to ensure the proper reviews for revision have occurred and update all documents.

NMTP and PE must review all Task Codes to ensure that changes are being made per the MOU and the NMTP has reviewed and approved all PE Task Codes being utilized within B332. NMTP and PE should revisit the MOU to ensure that it is still appropriate

It is unclear if change control, including the Unreviewed Safety Question (USQ) process, is being implemented properly within B332. USQDs reviewed during this evaluation were lacking in enough detail to allow the reviewer to fully understand the change and conclusions. Due to an inadequate technical baseline it is difficult to determine if a change would result in operating outside of the authorization basis. NMTP must continue to apply formal and rigorous change control to all VSS to ensure that modifications are appropriately identified and analyzed. USQDs must contain enough information for an independent evaluator to clearly understand how the analysis led to the conclusion of approval authority.

This issue should be rolled up into the current USQD Corrective Action Plan.

Although the system engineering program in B332 is progressing well, NMTP should consider adopting the concept of a design authority for Superblock. A design authority provides technical oversight and evaluations on the impact of changes on current design activities, ensures facility design integrity and approves all design modifications. A design authority also provides for consistent application of

processes, formal and deliberate decision-making for all vital safety systems, and ensures that a technically defensible basis exists for all VSS.

NMTP should evaluate the need for a Design Authority within B332.

V. Conclusions

This review concludes that configuration management for the Vital Safety Systems in B332 is not being applied adequately or appropriately. The infrastructure necessary for a successful CM program is clearly deficient and must be addressed to improve confidence in the reliability and operability of the vital safety systems.

The findings noted in both of the evaluation sections must be addressed by both LSO and LLNL and factored into the overall task of revising and correcting the CM implementation plan in DNT for B332. A project plan must be developed that will identify all elements of a CM program and subsequent system engineering program. This plan must also identify deliverables and milestones critical to success. The plan must consider funding, resources and competing priorities.

Upon review of the qualitative ratings of the VSS' and discussion with LSO senior management, it is recommended that all of the B332 VSS receive Phase II assessments. The Phase II assessment will provide for a comprehensive and in-depth review to support fully understanding the systems and graded based on existing knowledge. The Phase II assessments should be based on the objectives in "Model Assessment Criteria and Guidelines for Performing Phase II Assessments of Safety Systems at Defense Nuclear Facilities", November 2001.

It is recommended that the fire suppressions system and gloveboxes receive the first Phase II assessments because the data shows that there are many configuration management vulnerabilities as well as design issues that must be addressed in a timely manner to not only preserve the authorization basis. These assessments teams should joint DOE and LLNL teams and be based on the original Phase II guidance noted above.

VI. Summary of Findings and Opportunities for Improvements

Findings:

1. LLNL must revisit the guidance in the ES&H Manual concerning the institutionalized vital safety system assessments. The criteria used should ensure the Phase II CRAD objectives are met and allow for a graded approach in appropriate situations. LLNL must schedule these assessments for all VSS safety systems.

2. LSO must develop a schedule for the Safety System Oversight (SSO) personnel performance of appropriate assessments of the VSS that also reflect the Phase II CRADS.

3. The LSO/LLNL VSS Listing must be put under a more formal and rigorous change and document control system

4. B332 Facility management must baseline the status of drawing needs for each vital safety system and projectize the path forward to ensure these drawings are completed, revised and updated appropriately and accurately.

5. B332 Facility management must develop a consistent approach to defining, documenting and controlling the vital safety system boundaries and interfaces including system design descriptions.

6. B332 Facility management must document the boundaries and interfaces within the safety basis and clearly mark on system diagrams and drawings.

7. The B332 VSS must be appropriately assessed to identify the critical components of the system.

8. The B332 Maintenance and Operations Manual, UCRL-MA-127630 Revision 1 needs to be reviewed and revised including the MEL. The MEL must be revised to identify clearly the components critical to the operability of the each B332 VSS.

9. The B332 safety basis must be revised to clearly discuss the VSS' technical bases. This includes system and design requirements, system parameters, performance expectations, operational limitations, safety functions and functional requirements.

10. When the above information is developed and documented appropriately, B332 should review all implementing documentation to ensure they support the assumptions and requirements of the system.

11. Building 332 must begin performance of the LLNL Institutional VSS Assessments as provided for in ES&H Manual Document 41.2 and 50.1. The NMTP assessment schedule should ensure that an appropriate number are performed annually to provide a level of confidence in the continued implementation of configuration management for the VSS.

12. B332 Facility Management must schedule and being performance of required DOE O 433.1 assessments.

13. B332 Facility Management must review all implementing documents including operating procedures, surveillance and maintenance procedures, and other VSS

support documentation to ensure the proper reviews for revision have occurred and update all documents.

14. NMTP and PE must review all Task Codes to ensure that changes are being made per the MOU and the NMTP has reviewed and approved all PE Task Codes being utilized within B332. NMTP and PE should revisit the MOU to ensure that it is still appropriate

Opportunities for Improvement:

1. NMTP should evaluate the need for a Design Authority within B332.

References

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2. Letter dated February 3, 2004 (Fisher/Hill), "Status of LLNL Configuration Management Program"
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4. Letter dated November 9, 2004 (Yuan-Soo Hoo/Shotts), "Lawrence Livermore National Laboratory Configuration Management Program"
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9. DOE-STD-1073-2003, Configuration Management Program
10. Lawrence Livermore National Laboratory Environment Safety & Health Manual
11. DOE/University of California Contract, LLNL, No. W-7405-Eng-48
12. Draft DOE/OA-40 - Independent Oversight Inspection of Environment, Safety and Health Management at the LLNL", November 2004
13. "Model Assessment Criteria and Guidelines for Performing Phase II Assessments of Safety Systems at Defense Nuclear Facilities", November 2001

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2. Plutonium Facility - Building 332 Technical Safety Requirements, UCRL-AR-119592-00-REV-2, August 2002
3. Plutonium Facility – Building 332 Maintenance and Operations Manual, UCRL-MA-127630, Rev. 1 – October 1999
4. SRP-B332-013, R8 - Surveillance Requirement Procedure SR 4.6.1 Weekly, Channel Check of Criticality Alarm System, August 18, 2003
5. SRP-B332-014, R8 - Surveillance Requirement Procedure SR 4.6.2, Quarterly, Test Criticality Alarm System Audible and Visual Alarms, August 18, 2003
6. SRP-B332-015, R5 - Surveillance Requirement Procedure SR 4.6.3, Monthly, Criticality Alarm System Detector Electronics Check, December 6, 2002
7. SRP-B332-016, R4 - Surveillance Requirement Procedure SR 4.6.4, Semiannually, Functional Check of UPS Power Source to Criticality Alarm System, April 11, 2002
8. SRP-B332-017, R5 - Surveillance Requirement Procedure SR 4.6.5, Semiannually, Criticality Alarm System Channel Functional Test, December 6, 2002

9. ACP-B332-004, R3 - Operability of the Inert Gas Supply Systems - Every Working Day, June 27, 2003
10. ACP-B332-009, R4 - Facility Argon and Nitrogen Supply System Components Test and Inspection - Annually, February 21, 2003
11. ACP-B332-005, R2 - Facility Walkthrough Inspection after a Major Natural Phenomena Event, July 11, 2002
12. ACP-B332-016, R3 - Specific Administrative Controls for Responding to Safety Significant (SSCs) Malfunctions, October 28, 2003
13. SRP-B332-000, R4 - Control and Execution of B332 Surveillance Requirements, July 25, 2002
14. Plutonium Facility - Building 332, Maintenance and Operations Manual, - October 1999 - UCRL-MA-127630, R1
15. USQD: B332-03-020-D, "Removal of Workstation 7002 and Workstation 7003 from Room 1370" - June 5, 2003
16. USQD: B332-04-027-D, "Removal of Workstation 4509 from Room 1345" - May 25, 2004
17. USQD: B332-03-006-D, "Connection and Use of Argon in the Metal Conversion Glovebox (Workstation 0608) in Room 1006" - November 11, 2003
18. USQD: B332-04-039-D, "Add Nitrogen Header and Inert Gas Connection to the Integrated Surveillance Glovebox Line (WR 03-53)" - September 27, 2004
19. USQD: B332-04-028-D, "Criticality Alarm System Detector Head Locations for Phase II Reconfiguration" - June 14, 2004
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22. NMTP Engineering Note (EN04-332-016), "Impact on INC 1 GBES of removal of WS-4509 from RM 1345" - May 21, 2004
23. NMTP Engineering Note (EN03-332-015), "Impact of decommissioning and removal of work stations 7002 and 7003 on Glove Box Exhaust System" - June 4, 2003
24. Packaging and Transportation Safety (PATS) Program Office Specifications for TRU-Waste Drums with Poly Bag Liner, Revision 9 - January 27, 2004
25. Nuclear Filter Technology Product Specification Data Sheet (NFT019DS) - "NucFil 019DS ventilation filer with sample port
26. Nuclear Filter Technology Drawing - #0519004, "019 Direct Sample Assembly"
27. ACP-B332-015, Testing of Alarm Indicators in Room 1003 Control Room
28. ACP-B332-007, R4 - Annual Inspection of RMA Structure and Emergency Exit Door Seals, February 25, 2003
29. ACP-B332-003,R2 - Quarterly, Test of Glovebox Exhaust Systems Operation and Redundant Fan Controls, September 9, 2002
30. ACP-B332-015, R2 - Testing of Alarm Indicators in Room 1003 Control Room, April 25, 1997
31. ACP-B332-023, R1 - Monitoring Integrity of the 2-Hour Fire Barrier within the B332 RMA, February 25, 2002
32. ACP-B332-010, R2 - Heat Detector Test – Every 18 Months, July 25, 2002
33. ACP-B332-024, Inspection and Monitoring of Ventilation System Ducts
34. SRP-B332-003, R5 - Surveillance Requirement Procedure SR 4.3.1.1, Weekly Check

Ventilation System Differential Pressure, June 12 2002

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38. SRP-B332-008, R6 - Surveillance Requirement Procedure SR 4.5.1, Annually, Test Emergency Power System Components, September 29, 2004
39. SRP-B332-009, R5 - Surveillance Requirement Procedure SR 4.5.2.1, Monthly, Test Emergency Diesel Generators' Voltage and Frequency, April 19, 2002
40. SRP-B332-010, R4 Surveillance Requirement Procedure SR 4.5.2.2, Monthly, Verify Emergency Diesel Generators' Fuel Inventory, June 24, 2002
41. SRP-B332-011, R4 - Surveillance Requirement Procedure SR 4.5.2.3, Annually, Full-Load Check with Dummy Load for Emergency Diesel Generators' to Supply Power for Four Hours, June 24, 2002
42. SRP-B332-018, R4 - Surveillance Requirement Procedure SR 4.7.1.1, Quarterly, Test Fire-Suppression System Isolation Valves and Associated Supervisory Switches, July 23, 2002
43. SRP-B332-019, R3 - Surveillance Requirement Procedure SR 4.7.1.2, Weekly, Verify Fire Main Pressure, April 22, 2002
44. SRP-B332-020, R3 - Surveillance Requirement Procedure SR 4.7.1.3, Weekly, Verify Secondary Water Supply Tank Levels, December 5, 2001
45. SRP-B332-021, R3 - Surveillance Requirement Procedure SR 4.7.1.4, Weekly, Verify Pressure Blanket for Secondary Water Tanks, December 5, 2001
46. SRP-B332-022, R5 - Surveillance Requirement Procedure SR 4.7.1.5, Annually, Test Deluge Valves, Associated Flow Switches, and Spray Nozzles, August 25, 2004
47. ACP-B332-027, R2 - Monthly and Yearly Testing of Emergency Battery Lanterns and Exit Signs, August 17, 2004
48. SRP-B332-028, R1 – Tri-Annual Surveillance Requirement Procedure SR 4.3.4, Test the Function of Fusible Link Dampers, October 5, 2001
49. PuFO99-102 mpm, dated July 21, 1999, Memorandum of Understanding between Nuclear Material Technology Programs (NMTP) and Plant Engineering (PE)
50. Work Package WR-99-49m - "Loft Ductwork"
51. Work Package WR 3-43 – "Replace Increment 1 Ventilation Supply Damper"
52. Work Package WR-02-15 – "Replace Nitrogen Bottle Banks in Basement"
53. Work package WR 03-65 – Vault Re-Configuration Phase II"
54. Health Physics Discipline Action Plan, HP-16-W, Continuous Air Monitor, April 29, 2002
55. FOP-B332-010, R0 – B332 Gloveboxes, April 28, 1999
56. FEOP-B332-010-R0, Facility Equipment Operating Procedure B332 Gloveboxes, April 28, 1999
57. Plutonium Facility – Building 332 Facility Safety Plan, June 2003

Attachment 1

Configuration Management for VSS in B332
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?

Systems 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 2

NNSA Configuration Management Evaluation
Of
B332 Vital Safety Systems

	Vital Safety System	SSC	1	2	3	4	OVERALL
Bldg 332	Final HEPA Filters[P]	SC	**RED**				
	Room Ventilation System Increments 1 and 3[A]	SC	**RED**			**RED**	**RED**
	Glovebox Exhaust System[A]	SC				**RED**	
	Emergency Electric Power System[A]	SC			**RED**		
	Fire Suppression/Detection System[A]	SC	**RED**		**RED**	**RED**	**RED**
	Building Structure[P]	SC				**GREEN**	
	Downdraft exhaust ventilation system[A]	SC	**N/A***	**N/A**	**N/A**	**N/A**	**N/A**
	Continuous Air Monitoring System[A]	SS	**GREEN**	**BLACK***			
	Hydrogen Gas System[A]	SS	**GREEN**	**BLACK***	**BLACK***	**BLACK***	**BLACK***
	Gloveboxes[P]	SS				**RED**	
	Toxic Gas Monitor and Alarm System[A]	SS	**N/A***	**N/A**	**N/A**	**N/A**	**N/A**
	Fire Alarm and Detection[A]	SS					
	Glovebox Nitrogen Supply System[A]	SS	**RED**	**GREEN**			
	Glovebox Argon Supply System[A]	SS	**RED**	**GREEN**			
	Criticality Alarm System[A]	SS	**GREEN**	**GREEN**		**GREEN**	**GREEN**
	TRU waste containers (vents)[P]	SS	**BLACK***	**GREEN**	**GREEN**	**GREEN**	**GREEN**
	Emergency Battery Lights[A]	DID	**BLACK***	**GREEN**	**GREEN**	**GREEN**	**GREEN**

*** SEE REPORT IN ATTACHMENT 3**

Legend
Superscript [A] – Active safety system
Superscript [P] – Passive Safety System
SC – Safety Class
SS – Safety Significant
DID – Defense in Depth

GRADING

BLACK – Non-Existent
RED – Significant Deficiencies

GREEN – Compliant

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

Attachment 3

B332 VSS Evaluation Report

1. Final HEPA filtration stages

Authorization Basis – RED

As summarized in the draft OA report, there is a concern regarding the AB documentation associated with the HEPA filters:

> The potential for failure of the safety class room exhaust HEPA filters due to combustion product loading during a design/evaluation basis fire has not been analyzed. For a design basis room fire, the potential exists for combustion products to plug the safety class exhaust HEPA filters and cause their failure due to high differential pressure (DP). This condition had not been fully analyzed, and preliminary analyses performed by the OA team indicated that some current TSR allowed and actual room combustible loadings may exceed the safe filter loading capability.

Current As-built drawings exist for the HEPA Plenums. Specific location and number of HEPA filters are identified in SRPs.

SRPs sufficiently cover periodic performance assessment requirements of DOE Order 433.1.

Maintenance and Work Packages –

MEL is out of date (October 1999) and does not contain sufficient detail for proper configuration management. Individual filters are not listed separately.

Surveillance and Testing –

Existing SRP change control does not track specific changes from one revision to the next. It is not apparent if attached procedures also undergo the tri-annual review.

ACP-B332-015 Testing of Alarm Indicators in Room 1003 Control Room, last revision is 1997.

ACP-B332-016 – no issue.

Systems Operations -

Review of the ORPS GUI from 2003 thru 2004 identified the following reportable occurrence relating to system operability of the HEPA filters. In the review of the occurrence reports, consideration was not given to who identified the issues; however, many times the issues were identified by the facility system engineers:

> OAK-LLNL-LLNL-2004-0061, Failure to Comply with DOE Issued Safety Evaluation. Report (COA#27) and Declaration of PISA relative to the Performance of HEPA Filters in Smoke Conditions – B332

OVERALL –

2. Room Ventilation System (Increments 1 & 3)

Authorization Basis – RED

As summarized in the draft OA report, there are areas of concern regarding the AB documentation associated with the room ventilation system:

> The basis for the TSR limit of -0.05 inches w.c. dp between the building corridors and the outside has not been established. This value is low and may not adequately account for dp reversals that could occur due to wind-induced negative pressures on the outside of the building or instrument uncertainties.
>
> The ability of the Increment 3 room supply ventilation system to adequately throttle flow in response to plugging of the exhaust system HEPA filters for a design basis room fire had never been verified by analysis or test. The room supply system must throttle flow to prevent overpressure in Increment 3. Pressurization would invalidate the accident analyses by allowing an unfiltered, ground-level release. The supply fan vanes may not be able to throttle flow to the required extent because of their design. Subsequent to the OA team's identification of this concern, NMTP performed a test that demonstrated the ability of the supply system to provide adequate throttling to maintain building pressure within TSR limits. However, the margin of the throttling capability was judged by NMTP to be small enough to warrant considering changing the supply fan trip set point to a higher exhaust flow value.
>
> As summarized in the draft OA report, SR 4.3.1.2 requires the room exhaust bypass dampers to open if the flow drops below 50 percent of normal flow conditions; however, the surveillance procedure tests only if the dampers open

when flow is reduced but does not measure the flow rate at which the dampers open.

As-built drawings are not updated to reflect current system conditions. LLNL is working to consolidate existing drawings and modifications as a first step to develop a master drawing list which will be revised to reflect current conditions.

Periodic performance assessments as required by DOE Order 433.1 are not formalized but are planned to be as part of the CSE program.

Maintenance and Work Packages -

Labeling is on critical components only. LLNL is working of labeling of utilities.

MEL is out of date (October 1999) and does not contain sufficient detail for proper configuration management.

In the past PE Task Codes were not formally approved by Facility. The rule compliant DSA takes ownership of all maintenance procedures and plans to incorporate Task Codes into SRFs.

PE Task Code changes are not completed in accordance with MOU between NMTP and PE (PuFO99-102 mpm).

Surveillance and Testing–

SR 4.3.1.1

Procedure SRP-B332-003, the accuracy of the dp gauge is not specified, this may have an impact on meeting the SR.

SR 4.3.1.2

Does not test per SR performance criteria (flow is not verified).

Section 9.1.2 of SRP-B332-004 requires operator to observe the drop in flow rate. It appears that this is not being performed.

SR 4.3.2

Procedure SRP-B332-005, the accuracy of the dp gauge is not specified, this may have an impact on meeting the SR.

Section 9.1.2 and 9.1.3 of SRP-B332-005, the use of "Stop" reset is in question.

SR 4.3.3

SR 4.3.3 is also listed as 4.8.2, which is correct?

SR 4.3.4

SRP-332-028 is past due for review, last revision was 10/16/01.

ACP-B332-005 (Facility Walkthrough Inspection after a Major Natural Phenomena Event)

ACF-B332-005-R1, page 4, does not state the desired differential pressure value(s) for FFE-1000/2000 and FGBE-7000/8000.

ACF-B332-005-R1, page 5, does not state the desired differential pressure value(s) for FHE-1000/2000.

Systems Operations - RED

Review of the ORPS GUI from 2003 thru 2004 identified the following reportable occurrences relating to system operability of the room ventilation system. In the review of the occurrence reports, consideration was not given to who identified the issues; however, many times the issues were identified by the facility system engineers.

OAK-LLNL-LLNL-2004-0004, Failure of a Solenoid in Bldg 322 Ventilation System during Maintenance Activities

OAK-LLNL-LLNL-2004-0025, Inadvertent Shut-off of the Bldg 332 Increment 3 Exhaust Fan

OAK-LLNL-LLNL-2004-0043, Inadequate Covers on Sample Ports in Room Ventilation System Ducting (B-332)

OAK-LLNL-LLNL-0054, Management Concern – Bldg. 332 Increment 3 Room Ventilation Supply Low Flow Control

OAK-LLNL-LLNL-0055, Management Concern – Corridor to Outside Pressure Differential (B-332)

Overall – RED

3. Glovebox Exhaust System

Authorization Basis –

As-built drawings are not updated to reflect current system conditions. CSE is working to consolidate existing drawings and modifications as a first step to develop a master drawing list which will be revised to reflect current conditions.

Periodic performance assessments as required by DOE Order 433.1 are not formalized but are planned to be as part of the CSE program

Maintenance and Work Packages –

Review of work package WR 99-49 "Loft Ductwork" for replacement of ducting in Loft (commenced in 1999) area determined that an USQD was made and approval requests for temporary and permanent modifications to Increment 1 GBES and gloveboxes were submitted to LSO. Subsequent approvals were granted (Doc. numbers LSONST 030008 and 030026).

MEL is out of date (October 1999) and does not contain sufficient detail for proper configuration management. MEL does not include any components of the replaced ducting.

In the past PE Task Codes were not formally approved by Facility. The rule compliant DSA takes ownership of all maintenance procedures and plans to incorporate Task Codes into SRFs.

PE Task Code changes are not completed in accordance with MOU between NMTP and PE (PuFO99-102 mpm)

Surveillance and Testing –

ACP-B332-007 -- no issue

ACP-B332-010 Appendix H, B332 Work Control/Design Change Control Process Manual list 5 year frequency for check of the glovebox heat detectors. ACP-B332-010 requires check every 18 months.

ACP-B332-024 -- revision needed to revise inspection requirement for GBS Increment 1 (ducting has been replaced)

ACP-B332-005 (Facility Walkthrough Inspection after a Major Natural Phenomena Event)

ACF-B332-005-R1, page 3, does not state the desired differential pressure value(s) for FGBE-1000/2000 and FGBE-3000/4000.

ACF-B332-005-R1, page 4, does not state the desired differential pressure value(s) for FFE-1000/2000 and FGBE-7000/8000.

System Operation – RED

Review of the ORPS GUI from 2003 thru 2004 identified the following reportable occurrences relating to system operability of the glovebox exhaust system. In the review of the occurrence reports, consideration was not given to who identified the issues; however, many times the issues were identified by the facility system engineers.

OAK-LLNL-LLNL-2004-0040, Potential Cracking in Exhaust Ducting in Bldg. 332 RMA

OAK-LLNL-LLNL-2003-0005, Identification of Suspect/Counterfeit Bolts in Building 332 (Increment 1 GBES)

Overall –

4. Emergency Electrical Power System

Authorization Basis –

Occurrence Report OAK-LLNL-LLNL-2003-0038, Breakers Determined to have Lower Fault Duty Ratings than available Fault Duty Load (B332) dated 10/21/2003 was found to be a direct result of lack of calculations done to support the modifications to the system when a bypass circuit was installed as part of the original ATS-10 installation in the early 1990's.

Periodic performance assessments as required by DOE Order 433.1 are not formalized but are planned to be as part of the CSE program.

Maintenance and Work Packages –

MEL is out of date (October 1999) and does not contain sufficient detail for proper configuration management. In the past PE Task Codes were not formally approved

by Facility. The rule compliant DSA takes ownership of all maintenance procedures and plans to incorporate Task Codes into SRPs.

The PE Task Codes do not clearly denote that the Facility has reviewed and approved them. The rule compliant DSA takes ownership of all maintenance procedures and plans to incorporate Task Codes into SRPs.

PE Task Code changes are not completed in accordance with MOU between NMTP and PE (PuFO99-102 mpm)

Surveillance and Testing – RED

SR 4.5.1

Procedure SRP-B332-008, Task Codes have pen and ink changes, some with signature and date, some with initials and date, some with initials, some without any signature, initial or date.

References in Task Codes are out of date

The SR for the lead and lag Emergency Diesel Generators (EDGs) has specific time constraints for power availability. However, the task code procedure does not have an overall time specification that would validate this SR.

SR 4.5.2.1

Procedure SRP-B332-009, Task Code references are out of date and it appears that task code procedures have not been revised since 1997.

Task Code HV-58 states that normal range for transfer time of transfer switch 332 ATS07 is 0 to 10 min. Task Code HV-67 (SRP-B332-008) indicates normal transfer range for ATS07 is 6 – 45 Sec. Is HV-58 transfer time for reset or is it wrong?

SR 4.5.2.2

Procedure SRP-B332-010, the Task Code references are out of date.

Appears that the last revision to the Task Code was in 1996.

SR 4.5.2.3

Procedure SRP-B332-011, the Task Code references are out of date.

Appears that the last revision to the Task Code was in 1996.

Systems Operations –

Review of the ORPS GUI from 2003 thru 2004 identified the following reportable occurrences relating to system operability of the Emergency Power system. In the review of the occurrence reports, consideration was not given to who identified the issues; however, many times the issues were identified by the facility system engineers

- OAK-LLNL-LLNL-2003-0034, Failure of an ATS during Post Maintenance Testing (B-332)
- OAK-LLNL-LLNL-2003-0038, Breakers Determined to have Lower Fault Duty Ratings than available Fault Duty Load (B332)
- OAK-LLNL-LLNL-2003-0039, Failure of an Emergency Diesel Generator in B332

Overall –

5. Emergency Battery Lights Authorization

Basis –BLACK

Not address in current safety basis

Maintenance and Work Packages – GREEN

No specific issues

Surveillance and Testing - GREEN

ACP-B332-027 --- no issues

System Operations - GREEN

No specific issues

Overall – GREEN

6. Fire Suppression/Detection System

Authorization Basis – RED

As summarized in the draft OA report, there are several areas of concern regarding the AB documentation associated with the fire suppression system:

There is no analysis of the capability of the fire suppression system to deliver the required flow to the HEPA filter deluge system.

Although the current SAR states that the safety-class water supply is not provided to all safety class deluge nozzles in the Increment 1 room exhaust plenums, no technical basis exists. Note that this condition also exists for the Increment 1 and 3 glovebox exhaust plenums even though it was not identified in the draft OA report.

The current SAR and TSR identifies 72 psig as the required overpressure in the back up water supply tanks, which is not consistent with 75 psig as stated in NFPA. Water supply tank is currently being maintained at 78 psig.

As summarized in the draft OA report, some check valves and certain pressure control valves in the B332 fire protection system located in B332 are not being tested.

As-built drawings do not appear to be current for the fire suppression system.

Maintenance and Work Packages –

As summarized in the draft OA report, the following concerns were identified on work packages:

WR 3-43: No records in the work package indicate that an acceptance test was performed on each damper.

WR 02-15: No records in the work package indicate that acceptance tests were performed.

Surveillance and Testing – RED

SR 4.7.1.1 (SRP-B332-018)

6^{th} step of IE-118 states to open inspector test valve for each flow zone.

Inspector test valve are not identified in SRP or task code.

SR 4.7.1.2 (SRP-B332-019)

No issue.

SR 4.7.1.3 (SRP-B332-020)

The Indicator marks for the back up water supply tanks (2/3 ± 1" level) are marked in pen. This leads to questions regarding whether the indication is at the required 2/3 level.

Note that the 3-year revision was due on 12/5/04.

SR 4.7.1.4 (SRP-B332-021)

Note that the 3-year revision was due on 12/5/04.

As noted in the draft OA report, the 72 psig tank pressure should be 75 psig (as required per NFPA criteria).

SR 4.7.1.5 (SRP-B332-022)

Section 9.4 of SRP states to perform an "end to end" test prior to restoration of the paging system to fire alarm interface. This "end to end" test is not described or referenced.

ACP-B332-005 (Facility Walkthrough Inspection after a Major Natural Phenomena Event)

ACF-B332-005-R1, page 4, does not check to confirm pressure blanket of 72 psig for the back up water tanks and 400 psig for the back up nitrogen storage bottles.

System Operations – RED

As described in the draft OA report, one potential design deficiency introduced into the system by a 1995 modification, is the inappropriate location of a pressure sensing line. This deficiency could cause a control valve to cycle open and closed as the system piping where the sensor is located is alternatively pressurized and depressurized. This control valve is required to remain open during an accident where normal non-safety class fire water is lost. The deficiency was addressed in a 1984 modification, which relocated the pressure sensing line to an appropriate location upstream of a back flow preventer valve. However, the 1995 modification relocated the sensing line back downstream of the back flow preventer valve, thereby reintroducing the problem.

Review of the ORPS GUI from 2003 thru 2004 identified the following reportable occurrences relating to system operability of the fire suppression system. In the review of the occurrence reports, consideration was not given to who identified the

issues; however, many times the issues were identified by the facility system engineers.

OAK-LLNL-LLNL-2004-0053, Potential Inadequacy in the B332 Safety Analysis – Failure to Surveil Two Check Valves in the Emergency Water Supply

OAK-LLNL-LLNL-2004-0056, Potential Inadequacy in the B332 Safety Analysis – 75 psig Pressure Blanket

OAK-LLNL-LLNL-2004-0059, Failure to Comply with a DOE Issued Safety Evaluation Report (COA #11)

OAK-LLNL-LLNL-2004-0050, Potential Inadequacy in the B332 Safety Analysis – Available Water Flow to the HEPA Filters and Deluge for Increment 3

OAK-LLNL-LLNL-2004-0051, Potential Inadequacy in the B332 Safety Analysis – Emergency Water Supply to the Increment 1 Room Exhaust HEPA Filters

OAK-LLNL-LLNL-2004-0013, Loss of Water Pressure to the B332 Fire Suppression System

OAK-LLNL-LLNL-2003-0044, Loss of Water Pressure to the B332 Fire Suppression System

Overall – RED

7. B332 Structure

Authorization Basis –

There appears to be a question regarding the safety designation of the RMA floor. The B332 SAR does not specifically state the safety designation of the on grade floor. LSO interpretation of the SAR is that the floor is safety-class. Refer to LSONST: 030077, dated 12/01/03. As a result, an occurrence report was filed. Refer to occurrence report OAK-LLNL-LNL-2004-0003.

As-built drawings for this VSS are not known yet.

SRP-B332-007 and ACPs appear to cover the periodic performance assessment of the structure.

Maintenance and Work Packages –

WR 03-65: USQD included in this work package for the relocation of the criticality alarm system detector heads, but LSO approval of Laboratory's request to reinforce the floor in room 1050 is not included. Refer to LSO document #LSONST: 030081, dated 01/27/04. Note that the Laboratory originally did not intend to request approval to reinforce the concrete floor as documented in NMTP letter, NMTP-03-158, dated 11/18/03. NMTP was directed to submit a Rule-compliant request for LSO approval as LSO did not concur with the conclusion that this change is a negative USQD. Refer to LSONST: 030077, dated 12/01/03.

Surveillance and Testing –

SR 4.4.2 (SRP-B332-007)

SRP requires testing of emergency exit doors, including Rooms 1346 and 1313. There are no emergency exit doors in these rooms. Note that most of the emergency exit doors are in the process of being permanently secured. While this may not be an issue now, the SRP should be revised prior to the next scheduled surveillance.

ACP-B332-003 (Annual Visual Inspection of RMA Structure and Emergency Exit Door Seals)

No issues identified.

ACP-B332-005 (Facility Walkthrough Inspection after a Major Natural Phenomena Event)

ACF-B332-005-R1, page 5, does not inspect for structural damage to the s Structure (e.g., RMA exterior walls).

ACP-B332-015 (Testing of Alarm Indicators in Room 1003 Control Room)

This procedure appears to exceed its three-year review cycle (last revised on 04/25/97).

ACP-B332-023 (Monitoring Integrity of the Interior Fire barriers Within the B332 RMA)

This procedure appears to exceed its three-year review cycle (last revised on 04/25/01).

Systems Operations – GREEN

Review of the ORPS GUI from 2003 thru 2004 identified the following reportable occurrences relating to system operability of the structure. In the review of the occurrence reports, consideration was not given to who identified the issues; however, many times the issues were identified by the facility system engineers.

OAK-LLNL-LLNL-2004-0047, Discrepant As Found Condition in the Floor of a Room in the B332 RMA

Overall –

8. Downdraft Ventilation System

This system is currently inoperable and was approved by LSO (in 2001) to be permanently removed as a vital safety system. (LSO document #AMNST:010136, dated 12/11/2001). The current configuration of the downdraft exhaust ventilation system is as follows:

- The downdraft table, located in Room 1354 is disconnected from its exhaust ventilation system in the loft. Negative differential pressure from the downdraft system to the room is provided by installing a temporary connection to the Increment 1 glovebox exhaust system.
- The downdraft exhaust ducting (including recirculation line), final stage and recirculation line HEPA filters, exhaust fans and stack ducting has been removed.

Overall – N/A

9. Continuous Air Monitors

Authorization Basis – GREEN

No issues identified during review of the B332 SAR and selected CAM logbooks were reviewed that indicated weekly source checks were being performed and calibrations were in date.

Maintenance and Work Packages – BLACK

There were no maintenance activities or work packages available to review for the past year. Calibration activities did occur throughout the year as well as like-for-like replacements.

Surveillance and Testing –

The Health Physics Discipline Action Plan states that the CAM alarm set point should be 25 ● 5 counts per minute (cpm). This appears to be inconsistent with the CAM performance criteria which does not allow for the ± 5 cpm tolerance.

Systems Operations –

The OA report discussed a concern associated with providing a technical basis for the default time use in the STAR database for passive air samples which may apply also to CAMS.

Overall –

10. Hydrogen Gas Supply System

Authorization Basis – GREEN

Walkdown performed using schematic of system in authorization basis document. No issues noted.

Maintenance and Work Packages – BLACK

According to the lead system engineer, the hydrogen system was installed in 1983 with the HYDOX installed in Glovebox 7 in 1988. The system has not been used since the September 2001. There are no near-term plans to start the system.

Surveillance and Testing - BLACK

The system currently has an up to date P&ID, according to the lead system engineer. It was observed during the system walkdown that blue, rounded maintenance tags (labeled with a "2007") that were attached on critical pieces of the system to indicate that these pieces were due for maintenance in 2007 (every three years). All 2004 maintenance was verified as completed. Documentation for the maintenance activities was not available for review.

Systems Operations – BLACK

System not operated since September 2001.

Overall – BLACK

11. Gloveboxes

Authorization Basis –

All of the gloveboxes do not have up to date drawings.

Maintenance and Work Packages –

Two gloveboxes were sampled (7806 and 2108). In 1997, there was a Work Request placed for the installation of WS 2108. It appears that the defined process for instituting the Work Control Process was in place for the installation of this glovebox which was approved in 1999. However, there was a change made to change the supply line from Nitrogen to Argon. The work control process was instituted, as far as the reviewer could tell, however, it appears that a more graded approach was applied to the approval of this work package which could have led to a more informal application of the work control process.

Surveillance and Testing –

There is a TSR administrative control regarding an oxygen detector within the glovebox. It is not clear, based upon preliminary review of building procedures if there is documentation covering this safety device.

System Operations – RED

Facility Operating Procedure – B332 Gloveboxes (FOP-B332-010, Rev. 0), dated April 28, 1999, is out of date (should be updated every three years).

Facility Equipment Operating Procedure – B332 (FEOP-B332-010) also appears to be out of date.

There are out of date references to appropriate sections of the FSP, out of date technical references, incorrect number of Gloveboxes in the increments, and the administrative controls listed in this document do not correspond to the current TSRs.

Furthermore, the SAR reference for this document does not reflect the current SAR. Workstation 2108 was not listed in the Appendix J which listed all the workstations.

Overall –

12. Toxic Gas Monitor and Alarm System

The current authorization basis (page 4-84) states that the 'hydrogen chloride (HCl) and Chlorine (Cl_2) system are locked and tagged out of service. No HCl or Cl_2 is connected to either system. Section 4.4.8.1 of the Building 332 SAR states "Prior to activation, a readiness review will be completed. Note that LLNL has forwarded a letter to LSO requesting approval to reactivate this SS (NMTP-03-084, dated 08/18/03). LSO has not completed its review of this submittal.

Overall - N/A

13. Fire Alarm and Detection System

Authorization Basis –

In 2002, NMTP submitted proposed TSR page changes incorporating the new MXL Fire Detection and Alarm System. There have been several reiterations of AB documentation and it was approved by LSO and implemented by NMTP. However, the SRP notes eighteen Increment 1 Room Air Supply Dampers that must be surveilled, while the SAR identified nineteen.

Maintenance and Work Packages

Same issue as Glovebox Exhaust System in that detectors (part of the Detection System) need to be checked (per administrative controls) every eighteen months.

Surveillance and Testing –

On 11/2/2004, NMTP filed an ORPS report: OAK-LLNL-LLNL-2004-0057, TSR Violation- Failure to Include a Flow Switch in the Surveillance Requirement Procedures (SRP). The report notes that an administrative control states that flow switches shall be tested quarterly, but during a scheduled surveillance it was discovered that one of the flow control switches was not listed in the SRP. The OA also identified that the SRP 4.3.4, Triennial Test of the Fusible Link Fire Damper, was last performed in 2001.

System Operations –

Review of the ORPS GUI from 2002 through 2004 identified the following reportable occurrences relating to system operability of the Fire Alarm and Detection System. In the review of the occurrence reports, consideration was not given to who identified the issues; however, many times the issues were identified by the facility system engineers.

OAK-LLNL-LLNL-2002-0034, Anomaly in MXL Fire Detection and Alarm System in Building 332

OAK-LLNL-LLNL-2002-0027, Anomaly in New Fire Detection and Alarm System during Cutover in Building 332 RMA

Overall –

14. Glovebox Nitrogen Supply System

Authorization Basis – RED

The current authorization basis describes the Glovebox nitrogen supply system however the only technical safety requirements associated with this system are administrative controls rather than limiting conditions. The 332 SAR has inconsistencies throughout its sections on the system location and what accident it is required to be functioning for. The Draft DSA contains Limiting Conditions of Operation (LCOs) for this system.

It is not evident how a technically defensible change control process can be applied to this system due to the lack of description and performance criteria within the current authorization basis.

Maintenance and Work Packages - GREEN

Procedures are adequate for the identified maintenance for the system.

Surveillance and Testing -

The MEL does not appropriately note what the system components for the Glovebox Nitrogen Supply System are and which ones are critical. The MEL rates the system using property risk acceptance criteria. The Administrative Controls for this system require operation of 'failed-close solenoid valves, regulators, and relief valves' and testing of them annually. These actual components are not clearly identified in the authorization basis, or MEL; therefore you cannot be certain the components being tested in the SRPs are the complete credited suite.

It is unclear what the basis was for defining the surveillances for this system. The SRPs seem adequate for what is identified as required surveillance. The surveillance ensures that the required pressure is present in the gloveboxes and does check this daily. The solenoid valve is tested as required in the 332 SAR and the USQD

associated with the development of this procedure actually provides better information than the authorization basis documentation.

However, due to the lack of clear system boundaries and interfaces for this VSS, it is not evident that the surveillance is accomplishing the required tasks to support operability of this system and its associated interface with the gloveboxes and Glovebox exhaust system. Additionally it is unclear what gloveboxes require this system. An NMTP engineering note discusses the recent conversion of gloveboxes in room 1369 from argon to nitrogen. However the SAR does not provide the actual applicability of the system to specific gloveboxes.

System Operation -

The Occurrence Reports reviewed over the last year show one concerning the operation of this system and involved misalignment of valves. Until the system is clearly defined, including boundaries and interfaces, the operation of the system will always be questionable.

Overall -

15. Glovebox Argon Supply System

The conclusions for this system are identical to the Glovebox Nitrogen Supply System section above. The only difference concerns the occurrence report for misalignment of valves; however, the lessons learned out of that occurrence have definite applicability of this system.

Overall -

16. Criticality Alarm System

Authorization Basis – GREEN

The Criticality Alarm System is a well defined system within the current uthorization basis and the draft DSA provides additional detail. USQDs are being used appropriately and the system engineer is highly knowledgeable of the system.

Maintenance and Work Packages – GREEN

Maintenance on the system seems to be well defined.

Surveillance and Testing – GREEN

SRPs were reviewed for all of the authorization basis level surveillances.

System Operations – GREEN

The CAS seems to be appropriately analyzed, surveilled and maintained. LLNL has indicated that within the near future they intend on upgrading the system due to the original manufacturer not being able to provide system support.

Overall - GREEN

17. TRU Waste Containers (Vent)

Authorization Basis – BLACK

The current authorization basis is inadequate in its description of the TRU Waste Containers specifically what is credited through the safety analysis. The safety analysis acknowledges the potential for a waste drum failure and subsequent spill. However, the accident scenario only seems to credit the pedigree provided by the Packaging and Transportation program and furthermore Table 3-47 seems only to note the need for inventory control (i.e., container limits) rather than a drum attribute such as a vent.

It is unclear why the drums are identified as a Vital Safety System in B332 since the current safety analysis does not support this designation. However, LSO in the SER for the current governing safety basis directed LLNL to designate the TRU waste drums as safety significant.

Maintenance and Work Packages – GREEN

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 drums are inspected for structural integrity, corrosion, bulging, penetrations, etc. 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 Operation – 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