Office of Enterprise Assessments Targeted Review of the Safety System Management of the Secondary Confinement System and Safety Significant Power Distribution System at the Y-12 National Security Complex Highly Enriched Uranium Materials Facility

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Table of Contents

Acronyms

CAS	Contractor Assurance System
CM	Corrective Maintenance
CNS	Consolidated Nuclear Security, LLC
CRAD	Criteria, Review and Approach Document
DAR	Design Authority Representative
DOE	U.S. Department of Energy
DSA	Documented Safety Analysis
EA	Office of Enterprise Assessments
ES	Exhaust System
FIWG	Feedback and Improvement Working Group
FY	Fiscal Year
HEPA	High Efficiency Particulate Air
HEUMF	Highly Enriched Uranium Materials Facility (9720-82)
IMS	Issues Management System
kW	Kilowatt
LCO	Limiting Condition for Operation
M&TE	Measurement and Test Equipment
NMMP	Nuclear Maintenance Management Program
NNSA	National Nuclear Security Administration
NPO	NNSA Production Office
OFI	Opportunity for Improvement
ORPS	Occurrence Reporting and Processing System
PdM	Predictive Maintenance
PDSS	Safety Significant Power Distribution System
PISA	Potential Inadequacy in the Safety Analysis
PM	Preventive Maintenance
PO	Purchase Order
RCM	Reliability Centered Maintenance
S/CI	Suspect/Counterfeit Item
SCS	Secondary Confinement System
SE	System Engineer
SM	Shift Manager
SR	Surveillance Requirement
SSC	Structures, Systems, and Components
SSM	Safety System Management
SSO	Safety System Oversight
SSOR	Safety System Oversight Representative
STA	Shift Technical Advisor
TSR	Technical Safety Requirement
VSS	Vital Safety System
WO	Work Order
Y-12	Y-12 National Security Complex

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EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) Office of Environment, Safety and Health Assessments, within the Office of Enterprise Assessments (EA), conducted a targeted review of the management of the safety significant Secondary Confinement System and Safety Significant Power Distribution System at the Y-12 National Security Complex (Y-12) Highly Enriched Uranium Materials Facility (HEUMF). Consolidated Nuclear Security, LLC (CNS) is the management and operating contractor for Y-12. This independent review was conducted from July 7-10 and August 10-20, 2015, as part of a larger targeted assessment of safety structures, systems, and components across the DOE complex.

Overall, CNS is operating and maintaining the Secondary Confinement System and Safety Significant Power Distribution System in accordance with the documented safety analysis and technical safety requirements. In addition, the system drawings matched the installed system configuration. With one exception, the surveillance and testing activities for the selected systems are being performed in accordance with the HEUMF technical safety requirements and associated surveillance requirements, and by well qualified personnel. For the most part, systems are acceptably maintained and capable of performing their safety functions when needed.

CNS has established a system engineer program at Y-12 that adequately meets the requirements of DOE Order 420.1C, *Facility Safety*, although some areas of the program are not fully effective.

However, EA identified the following significant deficiencies during the review of CNS:

- Technical safety requirements contained several errors including a missing mode of applicability (e.g., system operability in operation and warm standby modes), a missing condition statement (e.g., actions to be taken when the Limiting Condition for Operations is not met) for the inoperability of one of two selected Secondary Confinement System exhaust fans, and an allowed completion time considerably longer than its supporting basis.

- CNS has not been performing the semi-annual bearing lubrication for two Secondary Confinement System support cooling fans. Failure to perform the lubrication brings into question the reliability of the fans during extended periods of operation under elevated temperatures.

- CNS was not demonstrating high efficiency particulate air filter efficiency for all potential maximum air flow configurations as required by the safety basis performance criteria.

The National Nuclear Security Administration Production Office (NPO) has evaluated the overall effectiveness of the contractor assurance system (CAS) and the evaluation states the CAS is at the "Initial Level," which means the CAS process is in place but is in its formative stages. Nonetheless, EA found for the areas reviewed that the feedback and improvement processes for HEUMF safety system management were generally functioning well. NPO is continuing to promote improvements in CNS performance in implementing the overall effectiveness of their CAS through the quarterly issues management meetings process.

Although NPO did not identify all the deficiencies noted in this review, NPO has been generally successful in monitoring CNS implementation of the elements of safety system management. The NPO

safety system oversight representative's approach to oversight of the safety significant systems includes formal assessments and operational awareness activities and has been effective at maintaining operational awareness and providing CNS with the appropriate feedback on performance relative to management and operation of the selected safety systems.

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1.0 PURPOSE

The U.S. Department of Energy (DOE) independent Office of Enterprise Assessments (EA) conducted a targeted review of the Y-12 National Security Complex (Y-12) safety system management (SSM). The purpose of the EA targeted review was to evaluate Consolidated Nuclear Security, LLC (CNS) implementation of program requirements and the adequacy of controls designed to reduce the risk resulting from a design basis fire and dispersion of nuclear materials, and the National Nuclear Security Administration (NNSA) Production Office (NPO) oversight of SSM. This targeted review was designed to evaluate the selected core SSM elements and to provide information to the sites and responsible DOE line management organizations for benchmarking their program's effectiveness. This review was conducted within the broader context of an ongoing program of targeted assessments of SSM across the DOE complex at hazard category 1, 2, and 3 nuclear facilities. The onsite portions of this EA targeted review were conducted during July 7-10 and August 10-20, 2015.

Existing EA criteria, review and approach documents (CRADs) were adapted to establish a focused set of review criteria, activities, and lines of inquiry for the targeted review in coordination with a facility specific review plan. This targeted review was of SSM as implemented at the Highly Enriched Uranium Materials Facility (HEUMF) for the Secondary Confinement System (SCS) and Safety Significant Power Distribution System (PDSS).

This report discusses the background, scope, methodology, results, and conclusions of the review. During this review, EA identified three findings and nine opportunities for improvement (OFIs).

2.0 SCOPE

This targeted review evaluated the effectiveness of processes for operating, maintaining, and overseeing the performance of selected safety systems at the Y-12 HEUMF. Specifically, EA selected the safety significant SCS and PDSS Systems for review. EA's review consisted of an evaluation of the procedures and processes used to demonstrate the ongoing operability and reliability of the system, and a specific evaluation of the implementation of those procedures and processes for a sample of components within that system. The review focused on the implementation of the HEUMF safety basis as it relates to the selected systems, but did not evaluate the adequacy of the documented safety analysis (DSA). Key observations and results from this review are presented in Section 5.0, *Results*.

3.0 BACKGROUND

EA's oversight program is designed to enhance DOE safety and security programs by providing DOE and contractor managers, Congress, and other stakeholders with an independent evaluation of the adequacy of DOE policy and requirements and the effectiveness of DOE and contractor line management performance in safety and security and other critical functions as directed by the Secretary of Energy. The DOE oversight program is described in and governed by DOE Order 227.1, *Independent Oversight Program*, and EA implements the program through a comprehensive set of internal protocols, operating practices, inspector guides, and process guides.

In a memorandum to DOE senior line management dated November 6, 2012, EA identified "Safety Class or Safety Significant Structures, Systems and Components" as a targeted review area, with a series of reviews starting in 2013. The memorandum also stated that these areas would be further defined in associated review plans. The reviews of safety systems covered several DOE sites to ensure that EA has sufficient information to provide insights into DOE-wide performance. When all selected DOE sites have been reviewed, EA will prepare a report summarizing the conclusions of the assessments regarding the overall status of SSM throughout the DOE complex, common issues, and lessons learned.

Oversight of Y-12 and Pantex is the responsibility of NPO. The NPO maintains a cadre of staff at both Y-12 and Pantex to provide oversight of SSM implementation.

CNS manages and operates both the Y-12 and the Pantex Plant under a five-year contract. CNS member companies include Bechtel National, Inc., Lockheed Martin, Orbital ATK, and SOC, with Booz Allen Hamilton as a teaming subcontractor.

4.0 METHODOLOGY

EA completed this targeted review through detailed document reviews and onsite review of contractor safety basis documentation, operations, maintenance, feedback and improvement activities, and system material condition. The review included observation of contractor personnel during facility walkthroughs, safety system walkdowns, surveillance tests, and NPO assessments or observations of maintenance on the safety system. The EA review team also performed detailed reviews of documentation associated with system design and change control, completed surveillance tests, assessed safety system performance, and reviewed the maintenance history for the selected safety system components. To evaluate contractor feedback and improvement processes, EA also reviewed development, implementation, and evaluation of corrective actions and dissemination and review of program and process documents; interviewed responsible managers and staff; and evaluated samples of process outputs (such as assessment reports), issues management documentation, trend and performance indicator reports, incident and event analysis reports, and lessons-learned publications.

The targeted review process was divided into several phases, including offsite planning, onsite scoping visits, onsite data collection activities, and report writing, validation, and review. Planning included discussions with responsible site personnel, determination of the details of safety systems to be reviewed, scheduling of the review, collection of applicable site procedures and documents, and document reviews. At the conclusion of onsite data collection, initial observations were briefed to key NPO and CNS personnel. EA prepared a draft independent review report identifying overall perspectives, deficiencies, and OFIs and made it available to line management for factual accuracy verification and feedback. Finally, EA provided the results of the review to key DOE managers before final publication of the report. The members of the EA review team, the Quality Review Board, and EA management responsible for this review are listed in Appendix A. A detailed list of the documents reviewed, personnel interviewed, and observations made during this review, relevant to the findings and conclusions of this report, is provided in Appendix B.

Selected objectives and criteria from the following sections of CRAD 45-11, Revision 3, *Safety Systems Inspection Criteria, Approach, and Lines of Inquiry*, were used to define the scope of this targeted review:

- NPO Safety Oversight Processes
- Implementation of DSA and Technical Safety Requirements (TSR) Expectations
- Maintenance

- Surveillance and Testing
- Operations
- Cognizant System Engineer (SE) Program
- Safety System Feedback and Improvement Processes

5.0 RESULTS

5.1 Implementation of DSA and TSR Expectations

Criterion:
There is consistency between the DSA requirements and the implementing documentation and physical configuration of the systems, structures, and components (SSCs). (10 CFR 830 Subpart B, DOE-STD-3009)

EA reviewed the HEUMF DSA and TSR to understand the system requirements (e.g., system description and safety functions) for the safety significant (SS) SCS and PDSS Systems and to verify that DSA expectations have been adequately captured in the TSRs. The DSA states the SCS and PDSS System are significant contributors to safety for a design basis fire. In addition, the SCS is credited in the design basis fire analysis to monitor the pump suction pressure of the HEUMF safety significant diesel fire pump. Overall, the systems are installed and operated in accordance with the DSA requirements.

The functional requirements and performance criteria specified in the DSA have been adequately translated into TSRs for implementation. However, the TSRs contained deficiencies and errors in several areas that may not provide the requirements necessary to ensure compliance with all DSA expectations. The following deficiencies were identified in the Limiting Condition for Operation (LCO) 3.3 for the SCS: (See **Finding-CNS-01**.)

- The Mode applicability for SCS operability in the TSRs LCO 3.3 is inconsistent with the Modes specified in the DSA Chapter 5, *Derivation of TSRs*. This is not consistent with the requirements of 10 CFR 830.205(1) that requires that technical safety requirements are to be derived from the DSA. The TSR requires SCS operability only in Operation Mode, whereas DSA Chapter 5 requires operability in Operation and Warm Standby Modes. The DSA Chapter 5 designation of both Modes is correct since the SCS safety function includes monitoring of Fire Pump Suction Pressure, and the fire protection system is required to be operable in Warm Standby.

- LCO 3.3 Condition H (identified as two or more SCS/Exhaust System (ES) fans inoperable) allowable outage time does not meet the criteria of 92 days, as established in DAC-FS-900000-A032, *Standardized Risk Based LCO Completion Times*. The required actions associated with Condition H do not specify compensatory actions to augment the absence of the SCS/ES fans. The action statements do not specify manual actions to reduce the frequency of the initiating event (as mandated by DAC-FS-900000-A032).

- LCO 3.3 does not have a condition statement under the actions section for when one of the selected SCS/ES fans is inoperable. Given there is no condition statement identified as part of the LCO, the inoperability of one selected fan would require the application of Generic LCO 3.0.3 and result in the facility being placed in the Warm Standby Mode within one hour. Alarm response procedure Y57-07-82-001, *Alarm Response in Building 9720-82*, which lists the actions to take when one or more SCS selected fans are inoperable, does not require HEUMF operations personnel to enter LCO 3.0.3.

5.2 Maintenance

Criteria:
The safety system is included in the nuclear facility maintenance management program and the DOE approved Nuclear Maintenance Management Plan required by DOE Order 433.1B, Maintenance Management Program for DOE Nuclear Facilities, and is maintained in a condition that ensures its integrity, operability, and reliability.

Maintenance processes for the system are in place for corrective maintenance (CM), preventive maintenance (PM), and predictive maintenance (PdM) and to manage the maintenance backlog; and the processes are consistent with the system's safety classification.

The system is periodically inspected in accordance with maintenance requirements.

Maintenance activities associated with the system, including work control, post-maintenance testing, material procurement and handling, and control and calibration of test equipment, are formally controlled to ensure that changes are not inadvertently introduced, the system fulfills its requirements, and system performance is not compromised.

Requirements are established for procurement and verification of items and services. Processes are established and implemented that ensure that approved suppliers continue to provide acceptable items and services.

EA reviewed selected elements of the Y-12 maintenance program in detail, including plans and programs; CM, PM, and PdM; periodic inspections; maintenance configuration control and conduct; training; and procurement processes, including provisions for precluding introduction of suspect/counterfeit items (S/CIs). Review activities included detailed walkthroughs of the SCS and PDSS System; review of a sample of CM and PM records from the previous three years for the selected systems; reviews with key maintenance management and staff; review of the Occurrence Reporting and Processing System (ORPS) reports from the last five years; observation of maintenance and calibration activities performed during the onsite data collection period; and attendance at routine daily maintenance meetings.

At the beginning of the onsite review, CNS management stated that the Y-12 maintenance process was "a good one." CNS management further stated that while maintenance work package quality has been an area of weakness, several initiatives are underway to improve package quality. These initiatives include the PM Optimization Program, where PM work plans are being revised to ensure that the work steps are clear and packages are reviewed/approved by a consistent set of management and staff. Approximately 500 of 6000 PM work plans have been improved. The effort began at Building 9204-2 and is planned for implementation at HEUMF in 2016. EA reviewed examples of completed work packages developed under the PM Optimization Program at Building 9204-2 and noted improvement on work step detail and acceptance criteria over reviewed work packages at HEUMF. Other initiatives include hiring degreed engineers as senior planners with a specific focus on working with the cognizant system engineer's (hereafter referred to as SE) to improve PM efficiency and reduce variances in PM execution. Finally, CNS maintenance management views worker feedback and their recent track record of worker follow-up on suggested improvements as another positive aspect of their program.

Nuclear Maintenance Management Plan and Program

Maintenance of safety-related SSCs is addressed in the DOE/NNSA-approved nuclear maintenance management program (NMMP) for Y-12 facilities (Y18-018PD), as required by DOE Order 433.1B, *Maintenance Management Program for DOE Nuclear Facilities*. The NMMP also complies with DOE

Order 430.1B, *Real Property Asset Management*, as it relates to maintenance of those assets. The NMMP references and is supported by multiple implementing maintenance procedures, and the implementing documents adequately reflect NMMP requirements. The maintenance program is identified as a safety management program and receives self-assessments triennially. These self-assessments have been performed well, and corrective actions for identified issues are placed into the issues management program.

The SCS and its supporting PDSS System have been operating for approximately six years, and the systems was found to be in good working order. However, according to the current approved SCS Health Report, the availability of the SCS for the quarter ending March 31, 2015, was only 58 percent. This low percentage is due to a functional failure of the PDSS System 200 kilowatts (kW) Diesel starting battery on March 11, 2015. During the onsite review period, no temporary modifications were issued on the systems, all calibrations were up to date, no SS equipment was out of service, and the systems were fully operable.

All maintenance programs and activities for Y-12 nuclear facilities 12 are conducted by the CNS Infrastructure organization. These nuclear facilities, which include HEUMF, are managed by the CNS Production organization, which determines the maintenance to be conducted and associated priorities.

Corrective, Preventive, and Predictive Maintenance

Generally, CNS has implemented acceptable CM, PM, and PdM processes for the SCS and PDSS System. These processes are consistent with the systems' safety-significant designation. Maintenance processes, including provisions for CM, PM and PdM, covering safety systems for HEUMF are addressed in the NMMP and Y-12 procedures for work control and change control. Maintenance is accomplished in accordance with site-wide procedure Y18-012, *Integrated Work Control Manual (IWCM)*, which properly flows down Y-12 NMMP requirements. The work control process identifies the hazards, associated controls, and parts to be used for each activity (i.e., CM, PM, or PdM), and a work package is generated specifically for that scope of work.

PM activities for HEUMF are performed by craft assigned to the facility and are developed for certain types of facility equipment. The PMs associated with the SCS and PDSS System are defined in associated reliability centered maintenance (RCM) plans, which are consistent with vendor recommendations and industry practice for these systems. For example, SCS fans receive 12-month PMs that include lubrication, belt tension, alignment, and sheave measurement. In addition, SCS exhaust fans also receive annual vibration and bearing temperature PdM analysis to aid in predicting near end of life component replacement. Certain PDSS System SSCs receive PMs, including the PDSS diesel generator which receives weekly PMs and replacement of PDSS System diesel starter batteries every three years. However, EA identified discrepancies and incomplete information in the SCS and PDSS Systems RCM analyses. Problems included "TBDs" (i.e., To Be Determined) on PM frequencies, incorrect frequencies, and typographical errors. In addition, vendor recommendations are not mentioned as a basis for PM tasks in most RCM analyses for HEUMF. Further, CNS has not performed the Y18-021 required biennial reviews of RCM analyses to ensure they are accurate and up to date.

EA also identified the following discrepancies in the implementation of the NMMP related to PM for the SCS and PDSS System: (See **Finding CNS-02**.)

- CNS could not provide evidence that SS PM Tasks (semi-annual lubrication) identified in the RCM analysis for SCS support ventilation fans (Supply Fans 2402 and 2502) have ever been performed, calling into question the continued reliability of the fans.

- Two functional failures of the PDSS System batteries have occurred during the last three years as a result of inadequate maintenance on safety significant equipment.

Eight SCS PM activities were observed during the onsite portion of this assessment (i.e., four SCS exhaust fan annual PMs, two related to the PDSS System, and two associated with SCS air handling unit PMs). In each case workers exhibited a high degree of knowledge about PM activities, followed proper lockout/tagout procedures, and verified that work instructions were correct before starting work.

In 2014, CNS management initiated a pilot PM Optimization Program to improve the quality and delivery of PM for safety and mission critical systems. The pilot was implemented at Building 9204-2 and has been partially implemented at Building 9204-2E. In July 2015, after initial roll-out of the pilot program, representatives from the Institute for Nuclear Power Operations helped validate the direction of the initiative. Overall, the program provides a good approach for improving PM delivery and reducing the non-safety PM backlog.

EA reviewed a sample of 33 work packages conducted during the last three years. The work steps were aligned with the stated work scope, using appropriately specified spare parts, and included post-maintenance testing to reestablish operability of the system/equipment. However, EA identified several minor discrepancies, including some work steps that were either unclear or did not include necessary acceptance criteria or reference material. For example, in two cases, a reference table was not included in the work package needed to perform a maintenance task, but workers used an uncontrolled copy during the PM. (See **OFI-CNS-01**.)

CNS management has developed an acceptable set of maintenance performance measures, which includes maintenance backlog for critical and non-critical systems. By the end of April 2015, there were 127 backlog work orders (WOs) for HEUMF. Thirty-five were related to CM needed on vital safety systems (VSS) equipment and 6 were associated with the SCS or the PDSS System. The total PM backlog for the same period was 49 WOs, 18 of which were associated with VSS SSCs and 7 were related to the SCS or PDSS System. No ORPS reports specifically involving performance degradation or maintenance of the SCS or PDSS System have been reported within the last three years except as noted above for the PDSS System uninterruptible power supply battery failure. Based on the relatively low total number of backlog CM and PM WOs and even lower backlog numbers of CM and PM for SCS and PDSS Systems equipment backlog, EA concluded that Y-12 is acceptably managing the maintenance backlog associated with safety systems and HEUMF.

Periodic Inspections

Periodic inspections and assessments are required, documented, and reviewed annually by CNS in accordance with Y17-019, *Walkdowns to Assess Configuration Management, Material Condition, and Aging Issues Associated with Vital Safety Systems*. The annual walkdown assessments of the SCS and PDSS Systems were properly staffed with engineers and managers, thorough, and well documented.

In 2013, CNS introduced a system health process to several facilities at Y-12, including HEUMF. The purpose of the system health process and associated system health report was to objectively evaluate the performance of safety and mission critical systems on a frequent basis. The process is being used, and the system health reports covering the SCS and PDSS Systems are performed semiannually. Overall, the process is effective and has identified to senior CNS management some key actions to improve safety system health at Y-12. (See Section 5.4.)

Configuration Control and Conduct of Maintenance

Maintenance planners assigned to each nuclear facility adequately plan maintenance work, including preparation of maintenance work packages using issued drawings and RCM plans. Work is authorized through the plan-of-the-day and plan-of-the-week processes. The HEUMF production organization's system health manager prioritizes the work. The HEUMF shift manager controls work activities and plant configuration, and work is coordinated with plant organizations through daily plan-of-the-day meetings. EA observed several work package page changes being issued following feedback from craft personnel during PM pre-job briefings, and in each case adequate planning resources were available to make the changes without impacting the work schedule. The process was acceptable to properly conduct maintenance activities at HEUMF and maintain proper safety system configuration.

Y-12 has established a process for control of maintenance tools, which includes calibration and measurement and test equipment (M&TE), through Y18-36-002, *Maintenance Tool and Equipment Management*. The Oak Ridge National Laboratory Metrology Organization performs calibration of facility equipment in accordance with Y60-802, *Calibration and Control of Measuring and Test Equipment*, and Y18-021, Chapter 7, *Field Calibration*. These procedures comply with the requirements of DOE/NNSA Development and Production Manual, 56XB, Chapter 13.2, *Metrology Program*, and American National Standard Institute/International Organization for Standardization/International Electric Commission 17025, *General Requirements for the Competence of Testing and Calibration Laboratories*.

No calibration activities were conducted at the facility during onsite data collection. However, EA reviewed two recently completed calibration packages and identified no issues. All observed M&TE that was used during the review was properly calibrated.

Procurement, Receipt Acceptance, and Suspect/Counterfeit Items

The Y-12 procurement process is defined in Y60-701, *Procurement Quality Manual*, and is supported by Y60-503, *Handling, Storing and Shipping*. The NMMP credits the integration of maintenance and procurement through Y30-802, *Basic Procurement Instruction*, and the Systems Applications and Products system's electronic requisitioning process for procurement actions. Y30-802 and Y60-701 define an acceptable process to ensure that parts required for maintenance activities are procured, receipt inspected, stored, controlled, and delivered to the facility to support maintenance activities. These documents were acceptable for obtaining SCS and PDSS Systems spare parts.

In November 2014, CNS established a safety-significant parts storage location in HEUMF without establishing roles and responsibilities for implementing the Level B Storage Plan. Previously, safety-significant parts were stored at Building 9212. Contrary to Y60-015, Chapter 5.5, *Handling, Storing, and Shipping of Items*, Section C.3, SS spare parts inventory at HEUMF is being managed without a formal procedure. However, EA did not observe any instances where non-SS parts were stored in the same area with SS parts or used in SS applications.

Parts for the SS portion of the SCS and PDSS Systems are appropriately procured as Quality Level 2 items using a commercial grade dedication process or from a list of Nuclear Quality Assurance Level 1 qualified vendors. EA viewed a sample of seven SCS and PDSS Systems spare parts in storage and also reviewed the associated procurement and receipt inspection documentation. Overall, the SS spare parts were properly procured, receipt inspected, and stored. However, EA found one deficiency associated with one of the receipt inspections. Purchase Order (PO) 4300087182 specified band splices with part number 40008. The commercial grade dedication documentation for this item included verification of part number as a critical characteristic with an acceptance criteria of "Part numbers on PO and data sheet match part numbers on items or packaging of items received." Contrary to this requirement, the data

sheet and part packaging of the item indicated part number "4008" instead of "40008" specified in the PO. The receipt inspection was completed with an acceptable result, but a non-conformance report wasn't written to resolve the discrepancy.

Y-12 has implemented a thorough process to guard against S/CI. Y60-138, *Suspect and Counterfeit Item Control Program Operations*, is used to implement the S/CI prevention process. In addition, all current Y-12 craft and SEs receive specific S/CI training so that, as work is performed and systems are walked down, any existing S/CI can be identified and dispositioned. The training records of all required HEUMF craft and engineering personnel indicated they had completed the required S/CI.

5.3 Surveillance and Testing

Criteria:
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.

Surveillance and test procedures confirm that key operating parameters for the overall system and its major components remain within safety basis and operating limits.

The acceptance criteria from the surveillance tests used to confirm system operability are consistent with the safety basis.

Instrumentation and M&TE for the system are calibrated and maintained.

EA reviewed the procedures and results used to meet the TSR surveillance requirements (SRs) (i.e., measurements of the key operating parameters required by the safety basis) for the safety significant SCS, the backup PDSS system, and the safety significant doors system. The EA review included two years of records of biennial SRs and a selected number of records of weekly SRs. Additionally, EA observed performance of the TSR SR for the weekly diesel driven fire pump SR as well as observation of the design feature required door gap verification. EA also reviewed calibration documentation and selected results for instruments and indicators used during the testing to meet the SRs.

Overall, the implementation of surveillance testing to fulfill the TSR SRs was acceptable. Operations personnel performing the TSR surveillance testing were well qualified and performed all tasks in accordance with the procedure. Operations personnel understood the DSA credited controls and the basis that demonstrates that the SSCs are fulfilling assigned safety functions. Although CNS met most requirements, EA identified some deficiencies and observations, specifically:

- The exhaust flow rate used during TSR surveillance aerosol testing of the SCS high efficiency particulate air (HEPA) filters (SR 4.3.11), to demonstrate HEPA filter efficiency, did not meet the required safety basis exhaust flowrate performance criteria. Normal Mode flowrates were used rather than the required SCS Mode flowrates on two of the three exhaust fan trains in 2013 and two of the three exhaust fan trains in 2015. This is contrary to the requirements of DOE-HDBK-1169 which is cited in the TSR bases. This test demonstrates the SCS safety function of providing a leak path factor of ≤ 0.2 by demonstrating HEPA filtration capability. As a result, the DSA required HEPA filter efficiency of 99.95 percent to achieve a leak path factor of ≤ 0.2 has not been demonstrated during the last two TSR surveillance tests. (See **Finding-CNS-03**.)

- The CNS Production Department, who prioritizes work at the facility, placed a low priority on CM of non-SS SSCs needed to support the biennial integrated SCS test. This caused an unnecessarily delay in performance of a SCS TSR surveillance (SR 4.3.12) and resulted in entry into the TSR grace

period (which at the time of this review was 3 months into the 6 month window).

- TSR surveillance test procedures associated with the SCS HEPA filter efficiency surveillance lacked the information necessary to accurately facilitate the testing. EA observed the following problematic procedure characteristics: (See **OFI-CNS-02**.)

  - Was not supported by a record of system lineup as required by Appendix A of the procedure.
  - Did not have a testing configuration drawing to facilitate procedure steps as required by Appendix D of the procedure.
  - Did not have a step to record or verify return-to-service notification to the control room.

- The calculation that supports the required volume of fuel for the Safety Significant Diesel Generator (DAC-EE-972082-A036) uses non-conservative inputs. The calculation supports acceptance criteria for SR 4.4.1, *Functional Surveillance Test of the Diesel Generator*, specifically the fuel volume required to support the safety basis diesel generator runtime duration. The calculation does not consider vortex formation and potential air entrainment in the fuel take-up pipe to the engine based on the permitted fuel level in the tank. Despite this analytical omission, there is enough fuel to safely meet the required engine runtime duration. (See **OFI-CNS-03**.)

- Diesel fuel consumption for the diesel driven fire pump and the emergency diesel generator is not validated to verify that there is enough fuel for the safety basis required runtime and that the vendor's fuel consumption information has not degraded. (See **OFI-CNS-04**.)

5.4 Operations

Criteria:
Procedures are technically accurate to achieve required system performance for normal, abnormal, remote shutdown, and emergency conditions. (DOE O 422.1 CRD 2.p)

Operations personnel are trained on procedure use, proper system response, failure modes, and required actions involved in credible accident scenarios in which the system is required to function. (DOE Order 426.2 CRD Chapters I and II)

Operations personnel are knowledgeable of system design and performance requirements in accordance with the facilities safety basis. (DOE O 422.1 CRD 2.a(5))

Formal processes have been established to control safety system equipment and system status to ensure proper operational configuration control is maintained in accordance with DOE Order 422.1, Conduct of Operations. (DOE O 422.1 CRD 2.h, k)

Y14-001, *Conduct of Operations Manual*, Chapter 16, *Technical Procedures*; Y15-232, *Technical Procedures*; and Y15-101, *Records and Controlled Documents Manual* guides HEUMF procedure development and control.Y14-02-011, *Conduct of Operations Supplement - Production Operations*, provides additional guidance, for place keeping and critical step error reduction. Reviewed procedures supporting operation, maintenance, and testing of the SCS and PDSS conformed to the established procedure guidance. Workers appropriately used procedures in the "continuous" use category.

EA observed good place-keeping practices as required by the *Conduct of Operations Manual* and associated production supplement, and annotation of the current revision of working copies of most procedures was included on the cover sheet. Current versions of drawings referenced by one TSR surveillance procedure were not annotated as being current as required by Y15-101, *Records and*

Controlled Documents. Y57-07-82-001, *Alarm Response in Building 9720-82,* was not annotated as a current working copy, nor maintained as a controlled copy per Y-15-101. A surveillance by HEUMF Production Operations (9119-F-0002) of the implementation of this requirement was performed in October 2014 and found acceptable, but Y57-07-82-001 has not been annotated weekly as required. (See **OFI-CNS-05**.)

Training for shift technical advisors (STA) and shift managers (SM) and operators is sufficiently comprehensive and detailed to give the operations staff a thorough knowledge of the safety basis and credited functions of the safety systems. HEUMF operators and STAs were knowledgeable of the TSRs and bases related to the SCS and PDSS Systems.

Operations and maintenance personnel who perform surveillances are appropriately trained for their roles and responsibilities. Trained individuals, usually qualified STAs who are also SMs, lead and perform surveillances. Maintenance personnel who support surveillance testing are trained in the TSRs and the specific procedures for accomplishing surveillance testing. Training materials contain objectives and the training process includes appropriate confirmation of learning. Continuing training for operations staff is required by the TSR (5.7 Facility Staff Qualifications and Training) and Y90-027, *Conduct of Training Manual*, and is accomplished through retraining using the original syllabus. Experienced operators are requalified in the same class as new operators. While requalification may meet many of the objectives of continuing training, this may not be as effective as a more deliberately designed continuing training program. The training manual, Chapter 4, *Qualification*, Section J, *Continuing Training Requirements*, contains specific requirements for continuing training. These elements include:

- Training in significant facility systems and components changes
- Applicable procedure changes
- Applicable industry operating experience
- Selected fundamentals with emphasis on seldom used knowledge and skills necessary to ensure safety
- Other training as needed to correct identified performance problems
- Periodic examinations, as appropriate.

EA evaluated the process of updating training for HEUMF. Although on distribution for weekly "Notification Reports Filed in ORPS," the Training Lead for HEUMF was unaware of the Y-12 lessons learned home page with search capabilities, limiting the scope of site and industry operating experience used in training. CNS could not identify a means of feedback to training based on changes in facility systems and components where a change to a procedure is not required. The training syllabus is revised in response to procedure changes, which generate Training Impact Assessments, and changes that impact the course content. Further, the syllabus has not undergone the three-year evaluation required by the training manual. (See **OFI-CNS-06**.)

The credited Safety System operational status is reflected on the human-machine interface displays, the Facility Management Enterprise System status boards, and the SMs log. Surveillance status is kept in the Systems Applications and Products system, which is queried weekly by HEUMF Operations for surveillance scheduling. The biennial integrated test of the SCS is about three months into the six month grace period because of inoperable non-safety system components that need to function for completion of the integrated test (see Section 5.3).

5.5 Cognizant System Engineer Program Documentation

Criterion:
The DOE contractor has established an effective SE program as defined in DOE Order 420.1C, Facility

Safety, to ensure continued operational readiness of identified systems to meet their safety functional requirements and performance criteria.

EA reviewed the SE program, SE training and qualifications, SE roles and responsibilities, safety system assessments (including the last three annual VSS walkdown/assessments and system health reports for the last 12 months for the selected system), operations and maintenance technical support, and some aspects of configuration management. Interviews with engineering management and two SEs were conducted.

During interviews, engineering management gave their perspectives on the current state of the SE program. Generally, engineering management considered the Y-12 SE program to be "good." Attrition is a continuing issue. The Annual VSS Walkdown Assessment is the only documented SE walkdown and system assessment required by the SE program. This is considered adequate by CNS management to comply with the periodic system assessment requirement in DOE Order 420.1C, *Facility Safety*. System Health reports that evaluate ongoing system performance are prepared on semiannual basis for the SCS and PDSS Systems, but are not required. However, system health reports are required for mission critical systems.

Cognizant System Engineer Program Documentation

The SE program for HEUMF is defined in Y17-017PD, *Vital Safety Systems System Engineer Program*. This document describes the systems that are under the program, the process assigning SEs to VSS, and the roles and responsibilities for SEs. Y17-017PD acceptably addresses the requirements of DOE Order 420.1C, *Facility Safety*, Chapter V, *Cognizant System Engineers.* However, some of the listed roles and responsibilities do not specify how the SE is to accomplish or document the responsibilities. For example: (See **OFI-CNS-07**.)

- "Performing reviews of appropriate logs, data trends, and work package feedback." This SE responsibility does not specify which logs, data trends, and work packages should be reviewed. In addition, the focus/purpose of the SE review is not specified. This responsibility is not specified in other Y-12 documents.

- "Identify corrective actions prior to failure or forced outage." The program only credits the annual VSS walkdown for periodic system assessments required by DOE Order 420.1C, *Facility Safety*; the program document does not specify how the SE would evaluate system performance "to identify corrective actions prior to failure or forced outage" and how SEs would identify "needs for improving efficiency and reliability," which is another SE responsibility.

Cognizant System Engineer Training and Qualifications

DOE Order 420.1C, *Facility Safety* requires cognizant SEs to be trained and qualified as Technical Support Personnel in accordance with DOE Order 426.2, *Personnel Selection, Training, Qualification and Certification Requirements for DOE Nuclear Facilities*. The Y-12 SE training program is described in the *Engineering Baseline Training Program* and the *Training and Qualification Program Descriptions for System Engineers*. There are four levels of qualification in the SE qualification process with the final level (Level 4) covering qualification on the assigned VSS. SE Level 4 qualification includes a VSS procedure document review, completion of a walkdown using the annual VSS walkdown procedure (Y17-019), and an interview with the SE's supervisor. EA reviewed a sample of six documented SE interviews and found that the interview questions varied significantly. Three of the six interviews contained only broad and general questions that did not measure the specific knowledge of the assigned safety systems. The other three contained sufficient detail, including discussion of flow paths and system operation. Other aspects of the SE qualification program were found to be acceptable. However, during interviews

and system walkdowns with SCS and PDSS Systems SEs, EA found the engineers to be knowledgeable of their systems and associated SE responsibilities.

SEs have been assigned to perform SE duties while in training because of the lack of qualified SEs at Y-12. At least one SE covering SS/SC fire suppression system at Y-12 was not fully qualified at the time of the onsite data collection period. During an interview, the engineer stated that there were no restrictions on his actions as a SE and no other fully qualified person provided oversight of his SE actions. The *Training and Qualification Program Descriptions for System Engineers* includes a provision for SEs-in-training to "ensure the technical adequacy" of their actions. The training and qualification program states "approval of any proposed SE-in-training actions by the DAR [design authority representative] or qualified SE will be documented in the form of co-signing required documentation." However, the documents listed in the training plan requiring oversight of a DAR or qualified SE do not include all of the documents reviewed and signed by the SE (e.g., PM work packages for SS SSCs and annual VSS walkdown assessments). As a result, some SEs-in-training take action without the oversight of the DAR or a qualified SE.

Engineering management stated that they do not implement this oversight by co-signing, as the training and qualification plan requires. The DAR simply signs in the normal location on the respective document. CNS was unable to demonstrate that additional oversight by a DAR or qualified SE was actually occurring as intended by the training and qualification plan for SEs-in-training.

Periodic Safety System Assessments

Periodic safety system assessments required by DOE Order 420.1C, *Facility Safety* are conducted in accordance Y17-019. These annual walkdowns are also conducted to satisfy DOE Order 433.1B for assessing material condition and aging of SSCs under the scope of the NMMP. Although Y17-019 states in the Purpose section that, "The walkdowns are one of the ways in which Y-12 maintains scrutiny of VSSs," CNS has no other procedure/requirement for monitoring and documenting the condition, health, performance, or reliability of VSSs at HEUMF. Routine field inspections and walkdowns are not required. (See **OFI-CNS-08**.)

As previously discussed in Section 5.1, Y-12 has instituted a system health process to evaluate system performance and reliability on an ongoing basis. The Y-12 system health process was modeled after a nuclear industry practice, which has been instrumental in significant increases in equipment reliability where effectively implemented. System health reports have been established for the SCS and PDSS System at HEUMF and are prepared on a semiannual basis. These health reports effectively bridged the gap between the official periodic VSS annual walkdowns. System health reports are required for mission critical systems, but are not required for VSSs.

The criteria contained in the health report cards include eight different areas (e.g., Equipment Condition, Support Systems, Configuration management, Maintenance Backlog). The criteria generally reflected helpful indications of a system's health. However, some of the attributes that comprise the health report for SCS are not effective in determining relative health of the systems. For example, "Availability" is one of the eight attributes comprising the report for SCS. The "Availability" for SCS is a function of seven highly reliable components of the system and a less reliable SCS "General" function. The first seven are expected to always be available. However, the expectation for the SCS system in general is only 38.71 percent. With all eight of these functions equally weighted, the SCS health score for the period ending March 31, 2015, for "Availability" is biased in an overly healthy condition with an average score of 92 percent rather than being more heavily weighted by the general SCS availability of 58 percent. (See **OFI-CNS-09**.)

Operations and Maintenance Technical Support

During EA observation of facility activities, the SEs supported operations and maintenance activities. Review of completed procedures and work packages also reflect thorough SE involvement. Overall, the effectiveness of assigned SEs at HEUMF is acceptable. For example, SEs are required to approve the performance of PMs on SS SSCs through a sign-off in the work package.

Configuration Management

The SE has a significant responsibility in maintaining design control over assigned systems. As noted elsewhere in this section, the SE leads the annual VSS walkdowns (per Y17-019) to verify the condition and configuration of VSS SSCs. SEs also specify PWT requirements for SS maintenance activities to ensure that systems are properly returned to operable status. Samples of PWT in maintenance documents were reviewed by EA. Based on this review and onsite observation, SEs are adequately involved in managing the configuration of the selected systems at HEUMF.

5.6 Safety System Feedback and Improvement

Criteria:
The contractor's assurance system has processes in place and effectively monitors and evaluates engineering, configuration management, maintenance, surveillance and testing, operations, and operating experience, including the use of performance indicators/measures, allocation of resources, and the identification and application of lessons learned. (DOE Order 226.1B Attachment 1, 2a)

Formal processes are in place and effectively implemented to identify and analyze problems and issues (including operational incidents and events) related to engineering, configuration management, maintenance, surveillance and testing, and operations assurance activities and conditions; to identify, track, monitor, and close corrective actions; and to verify the effectiveness of corrective actions. (DOE Order 226.1B Attachment 1, 2b(3))

Results of engineering, configuration management, maintenance, surveillance and testing, and operations assurance processes for safety systems are periodically analyzed, compiled and, as appropriate, reported or available to DOE line management as part of contract performance evaluation. (DOE Order 226.1B Attachment 1, 2b(3) and (5))

As an NNSA site, Y12 implements the requirements of NA-1 Supplemental Directive 226.1A, *NNSA Line Oversight and Contractor Assurance,* and NAP-21, *Transformation and Governance*. Y-12 program description Y15-906PD, *Contractor Assurance System,* was approved conditionally by NPO on December 9, 2014, [COR-NPO-60 ESH-12.9.2014-605527, *NNSA production Office Review of YlS-906, Contractor Assurance System Program Description and PLN-0040, PANTEX Contractor Assurance System Description Document*]. The conditions relate to integration of the contractor assurance system (CAS) description for Y-12 and Pantex and clarification of the extent of condition review element and NPO terminology. An effort is underway to revise the CAS description to satisfy these concerns.

NPO has evaluated the overall effectiveness of the CAS, and the evaluation states that the CAS is at the "Initial Level," which means the CAS process is in place but in its formative stages. Although the reported overall effectiveness of the CAS was at the "Initial Level," EA found, for the areas reviewed, that the feedback and improvement processes for HEUMF SSM were generally functioning well. NPO is continuing to improve CNS performance in implementing the overall effectiveness of their CAS through the quarterly issues management meetings process.

Assessment Program

EA evaluated the implementation of feedback and improvement programs and processes that affect nuclear safety systems at the HEUMF. CNS feedback and continuous improvement programs and processes are adequately described in documents including the program description document Y15-906PD, which is implemented through the following key processes:

- Y15-902, *Management Assessment*
- Y15-903, *Independent Assessment Program*
- Y15-909, *Surveillance*
- Y15-312, *Issues Management Process*
- Y15-331, *Lessons Learned Program*
- Y14-192, *Occurrence Notification and Reporting*
- Y11-617, *Employee Concerns Program.*

These procedures provided detailed guidance or references for processes for assessment activities. Numerous additional guides and templates are maintained to augment these procedures. For example, Y30-811, *Subcontract Management Program Manual*, contains adequate detail to ensure subcontractor scope relative to CAS is incorporated in subcontracts. The suite of documents reviewed that support feedback and improvement and CAS would provide an adequate framework for an effective program when appropriately implemented.

CNS has formal processes for planning and conducting assessments and conducts a high percentage of planned assessments using trained and qualified assessors and leads as discussed below. The scheduling process does not explain how the various assessment types are balanced, and the mix of types is inconsistent among organizations. Although not displayed in a single schedule, schedules for Internal Audit, Independent Assessment, and Management Assessment along with the Surveillance schedule are finalized and posted to the Integrated Audit and Assessment Schedules system on the Y-12 intranet.

The Fiscal Year (FY) 2015 assessment schedules include TSR implementation assessments, Facility Evaluations, criticality safety, Fire Protection, work control, corrective actions, and adequacy of extent of condition reviews. EA reviewed a sample of completed assessments for a variety of topics including extent of condition reviews, flow down of conduct of operations requirements, HEUMF evaluation, effectiveness of corrective actions, and effectiveness of closed issues. In general, CNS effectively planned, executed, and documented all of the reviewed assessments.

CNS procedure Y17-019, *Walkdowns to Assess Configuration Management, Material Condition, and Aging Issues Associated with Vital Safety Systems,* describes one way Y-12 uses to maintain VSS operational awareness. One element of the procedure includes an assessment of the reliability of the VSS by the SE. The procedure refers the engineer to several sources, including maintenance, but does not reference the RCM elements of Y18-021, *Physical Asset Management Solution,* to confirm the adequacy of the RCM analysis. While the walkdowns were adequate, the inclusion of the RCM analysis would improve the structure that maintains the VSS. Additional discussion of these walkdowns is included in Section 5.2 of this report, under *Periodic Inspections.*

EA reviewed independent assessments, management assessments, and surveillances. With one exception, CNS implemented these assessments and surveillances using proper assessment techniques. For example, analysis supported appropriate conclusions, issues were identified, sufficient documentation was included, assessment scopes and plans with criteria were included, and assessors were qualified and signed off as necessary. The one exception included a Project Management Assessment PD-MA-2015-002, *Corrective Actions,* which reviewed approximately 90 issues and found that closure of most issues

complied with Y15-312, *Issues Management Process*. Although PD-MA-2015-002 found items that did not meet issues management system (IMS) requirements for closure, no findings or observations were identified in the assessment report to address the failure to implement effective closure actions for some issues. However, some recommendations were made and actions were taken to implement enhanced oversight in the field by the senior supervisory watch to review closure actions for issues.

Assessment Training & Qualification

Y15-902 identifies qualification requirements for management assessments; Y15-904, *Qualification of Independent Assessment Personnel*, addresses the training requirements for leading and supporting independent assessments; and Y15-902, *Management Assessment*, and Y15-909, *Surveillance*, identify the qualification requirements to lead those respective reviews. Numerous training courses are established to provide the necessary skills and competence. The assessment procedures require at least one person performing an assessment to have completed necessary training and qualification, with independent assessments requiring the highest levels of qualification. Review of training records, completed reports, and interviews with assessor and cause analysts found the individuals to be competent in performing their assigned roles.

Issues Management

CNS has implemented an issues management process that is described in Y15-312, *Issues Management Process*. This process guides the assignment of issues to one of four significance levels for a graded level of rigor for cause analysis, extent of condition review, corrective action plan development, and effectiveness review. EA performed a selected review of issues and reports in the IMS and found generally complete evidence of the action plans and closure documentation. Furthermore, the corrective actions that were reviewed indicated a reasonable set of actions to correct and prevent recurrence when implemented. In addition, several cause analyses were reviewed that ranged from formal significance Level A root cause analyses to less formal cause determinations. The review indicated that the cause analysis documentation was of high quality.

NPO has identified an issue with the implementation of CNS extent of condition process. As a result, CNS has established a Feedback and Improvement Working Group (FIWG) that meets bi-weekly and produces a quarterly analysis of feedback and improvement processes. The Y-12 procedure Y15-707, *System Feedback and Improvement Process*, established the site FIWG and contains roles and responsibilities for the group. The FIWG reviews many feedback and analysis sources (including metrics, assessments, and surveillances performed in the quarterly occurrence reporting analysis) and reviews a section of completed work packages for common issues and trends.

The FIWG report for the second quarter of FY 2015 (RP-YAREA-F-0478 000 00) analyzed several performance and improvement effectiveness issues. One topic discussed in the FIWG report was conduct of operations. While the Production organization was implementing a continuous improvement initiative championing a performance based leadership training, the FIWG analysis of site performance found the continuing conduct of operations performance weaknesses to be partially responsible for an outage of a non-nuclear high hazard facility that impacted mission accomplishment. Consequently, the FIWG recorded a concern that ongoing corrective actions were not improving the conduct of operations trend, suggesting that senior management try something new. Overall, the report contained a good analysis of events and other feedback inputs.

EA reviewed open issues for HEUMF. The backlog of corrective actions was reasonable and did not directly affect safety systems. Facility staff had a good understanding of open action items that affected facility systems.

Event Reporting and Analysis

Events related to HEUMF safety systems are appropriately reported and analyzed. Occurrences are reported, critiques are conducted, causal analyses are performed, and investigations are conducted. EA reviewed a selection of the 46 occurrences for 2014 and 25 through August 2015 at Y-12 and identified no issues with reports and issue resolutions. Price Anderson noncompliance issues are reported through the noncompliance tracking system process and are screened and tracked in IMS. Furthermore, CNS has implemented an initial event identification process to alert NPO and the CNS Senior Management when abnormal or unplanned operational conditions occur at the facilities.

Operating Experience/Lessons Learned

Event critiques, post-job reviews, and evaluation of corrective action development are captured as sources of lessons learned. CNS is active in developing lessons learned inputs to the DOE Operational Event Analysis database, having input dozens in the last year. The most recent was *Human Performance Improvement (HPI) Opportunities from LOTO Activities Reviews* (L-2015-OR-Y12-7644). CNS assigns the development of lesson learned as an action in the corrective action plan, reflecting management's emphasis on holistic corrective action. Quarterly Occurrence Reporting Performance Analysis and Trending Reports are developed monthly with a 12 month retrospective. This report is an input to the FIWG, which uses it as one of several sources to identify trends requiring action. The lesson learned website allows users to subscribe to lessons relevant to their interests and job responsibilities. Overall, the program is well implemented.

Performance Measures

CNS metrics are developed and maintained according to Y15-908PD, *Y-12 Performance Metrics Program*. The program provides for monitoring and managing of programs and performance with transparency to the NPO. Metrics are not only compiled and evaluated monthly but evaluated for effectiveness and organizational performance. A quarterly report is compiled that analyzes the metrics for organizational health. The report *Organizational Health Metrics analysis Report for the First Quarter FY 2015* (RP YAREA-F—423 000 00) highlights the issues of staffing and aging infrastructure and equipment. While the scope of metrics is broad, the results do not present an accurate status relative to NPO's evaluation of the CAS. This quarterly metrics report rated CAS as very good, as did the CNS CAS quarterly report for the same period when NPO evaluated the same available data and characterized the CAS at the lowest level of implementation (initial level).

As directed by NPO, the contractor now provides a CNS Pantex/Y-12 Performance Self-Assessment Report (linked to the contractor performance evaluation plan) and a CNS CAS Performance Report each quarter. Issues from the evaluations are migrated into key initiatives, which are then reported on quarterly. NPO evaluates the CAS report in a Quarterly Issues Management Meeting Report. Significant communication is taking place between the NPO and CNS as the two site systems are merged into one enterprise. Both entities are effectively using metrics and their analysis to guide the integration process.

5.7 NPO Safety Oversight Processes

Criteria:
The DOE field element has established and implemented effective oversight processes that support SSM. (DOE Order 226.1B 4)

The DOE site office has established an effective Safety System Oversight (SSO) program for qualifying staff to apply engineering expertise in its oversight of the assigned safety systems and to monitor performance of the contractor's cognizant SE program. (DOE O 426.1, Appendix D)

Procedure NPO-3.4.1.1, *NPO Oversight Process*, details the overall approach, responsibilities, and requirements for conducting line oversight of CNS. The document provides a general overview of the oversight philosophy and an annotated process flow chart of the elements of the process. The *NPO Oversight Planning Process*, NPO-3.1.2, is the only referenced procedure. This process guides the development of the Site Integrated Assessment Plan and meets NNSA guidance (BOP 10.003, Site Integrated Assessment Plan (SIAP) Development, Updating, and Reporting and NA-1 SD 226.1A, NNSA Line Oversight and Contractor Assurance System (LOCAS)). The types of assessments (e.g., independent, shadow) are based on risk determinations. Although NPO has made some improvements in their oversight process, they have not maintained the oversight process procedures up to date to reflect management decisions. For example, NPO no longer holds Monthly Issues Management Meetings as discussed in the procedure. Instead, NPO holds Quarterly Issues Management Meetings and bi-weekly Integrated Weekly Operations Calls. Similarly, NPO no longer issues the "watch list" and "top Issues list" and has replaced them with Key Initiatives and Initiatives. The process description document is currently under revision to reflect current NPO oversight terms and practices.

NPO-3.1.2, *NPO Oversight Planning Process*, provides adequate detail to guide assistant managers in identifying required and focus assessment topics and in risk ranking the system elements. About 100 assessments are in the current Site Integrated Assessment Plan related to safety systems or programs including a mix of shadow assessments, self-assessments, independent assessments, and external assessments. Subject matter experts, SSO Representatives (SSORs), Facility Representatives, and managers all contribute to oversight and NPO self-assessments. NPO documents results of oversight assessments in ePegasus with any issues found in Y-12 programs, processes, and performance transmitted to CNS by letter for disposition.

Oversight guides are developed by assistant managers to provide specific guidance on how to accomplish effective oversight in the applicable organization. EA reviewed the *NPO Nuclear Safety & Engineering Oversight Guide*, applicable to NPO Nuclear Safety & Engineering Office (NPO-10)*; NPO Environment, Safety, Health and Quality Oversight Guide*, applicable to the NPO Environment, Safety, Health and Quality Oversight Office (NPO-60), and *NPO Assistant Manager for Operations Management Oversight Guide*, applicable to the NPO Operations Management Oversight Office (NPO-30). These oversight guides provide varying levels of information and structure for the assistant manager's scope. The NPO-30 guide provides guidance relative to shadow assessments. NPO-10 and NPO-60 conduct shadow assessments but their guidance does not provide detailed expectations for their use, leading to inconsistent results. NPO 3.4.1.2.1, *NS&E Issues Evaluation and Management Process*, directs the use of a database on a SharePoint site for issue tracking, which conflicts with NPO 1.5, while NPO-30 uses ePegaus.

During this EA review, NPO was conducting a self-assessment of Federal oversight activities. EA reviewed the NPO CRAD document and interviewed several personnel conducting the self-assessment. The planned NPO self-assessment of oversight processes was thorough and addressed effective implementation and results.

Safety System Oversight

The NPO management processes to implement SSO are defined in NPO 3.1.3.2, *Safety System Oversight Program Description*. NPO Procedure 3.1.3.2 implements the SSO specific requirements established in DOE O 426.1, *Federal Technical Capability*. As required by Procedure 3.1.3.2, NPO has assigned an

SSOR to oversee the CNS management of the safety significant SCS and PDSS Systems. The SSOR oversight approach includes formal assessments and operational awareness activities. The SSOR for the SCS and PDSS Systems has been assigned a site specific qualification standard that specifies the knowledge, skills, and abilities that must be demonstrated to be considered qualified. The assigned SSOR has completed all but one competency of the qualification standard. The one remaining competency to be completed consisted of demonstrating knowledge of assessment processes by leading an assessment activity. The SSOR was conducting the assessment in parallel with the EA review to demonstrate proficiency for the last competency.

The SSOR was knowledgeable of the NPO SSO program expectations and implementing mechanisms. In addition, the SSOR was knowledgeable of CNS maintenance processes, safety basis requirements, the SCS and PDSS Systems configuration management documentation, and details on TSR surveillance testing.

EA observed daily SSOR oversight activities to monitor the CNS management of the SCS and PDSS Systems. The SSOR activities consisted of conducting walkdowns of the SCS and PDSS System to verify compliance with configuration management documentation (e.g., drawing and procedures) and to observe the material condition of the safety significant equipment. The SSO demonstrated an in-depth knowledge of the SCS and PDSS Systems equipment configurations and the associated safety basis requirements, e.g., SRs and system functional requirements.

Other SSOR activities observed included meetings with NPO management and CNS engineering staff to discuss technical issues associated with the SCS and PDSS. The NPO staff and NPO management communicated issues correctly and worked well together. Technical issues were discussed in sufficient detail to develop acceptable approaches for resolution, and all personnel involved freely expressed their opinions. Generally, candid dialogue and debate was encouraged about the technical issues and took a conservative decision making approach in areas where understanding was incomplete. For example, in one meeting NPO discussed a technical issue with surveillance testing of the smoke detectors that actuate the SCS, an issue which had been open with CNS for almost one year. The meeting resulted in NPO providing written direction to CNS to outline the expected actions to be taken for resolution. At the end of the meeting, NPO-10 and NPO-60 Management were self-critical of their interactions with CNS, questioning what changes or actions need to occur within NPO to improve the CNS performance in responding to technical issues associated with the safety basis implementation.

As a result of the recent CNS demonstrated reduced performance associated with evaluating the technical issues with the SCS and PDSS Systems, timely and correct application of the USQ potential inadequacy in the safety analysis (PISA) process, and along with other similar CNS performance issues being identified by other NPO disciplines, NPO has formally communicated an emerging issue to CNS describing NPO's concern with CNS problem identification and resolution processes. Specifically, the emerging issue communicated stated:

> *Issues potentially impacting safety, security, and quality are not consistently identified and reported, and it is weakening the overall performance of both production plants. There seems to be a reluctance to report issues completely, accurately, and timely which leads to issues not being properly prioritized/characterized. A fundamental component of a Contractor Assurance System, as identified in DOE O 226.1B, is "Contains an issues management process that is capable of categorizing the significance of findings based on risk and priority and other appropriate factors that enables contractor management to ensure that problems are evaluated and corrected on a timely basis." Examples include:*
>
> - *Entering the process for the discovery of conditions which indicate a PISA*

- *Using the appropriate Occurrence Reporting and Processing System categorization*
- *Self-identifying work place exposures to workers*
- *Categorization of Safeguards and Security Events.*

6.0 CONCLUSIONS

CNS is operating and maintaining the SCS and PDSS Systems in accordance with the DSA and TSRs. Generally, the SCS and PDSS System are installed and operated in a manner consistent with the DSA and TSR expectations. System drawings matched the installed system configuration. However, the TSRs contained several errors, including a missing mode of applicability, a missing condition statement for the inoperability of one of two selected SCS exhaust fans, and an allowed completion time considerably longer than the supporting basis.

During the course of the assessment, CNS conducted evaluations of two issues that indicated potential inadequacies in the implementation of the DSA requirements. CNS was generally reluctant to enter the PISA process; however, CNS eventually declared a PISA upon written direction from NPO. Additionally, this EA review has identified several areas where the implementation of TSR expectations were not met.

Overall, acceptable maintenance processes for the SCS and PDSS System are in place for CM, PM, and PdM and are consistent with the systems' safety significant designation. During the review, the systems were operable, with only minor out-of-service equipment and no active temporary modifications, and all system instrumentation requiring calibration was current. Furthermore, observation of maintenance activities and review of maintenance procedures and work documents indicated implementation of an effective maintenance program. However, EA identified three examples that indicated inadequate implementation of PM requirements, which led to two functional failures of safety significant PDSS system batteries and questions about reliability of SS SCS and PDSS Systems SSCs. In addition, EA noted deficiencies related to the implementation of a level B parts storage area at HEUMF and failure to perform required biennial reviews of RCM analyses.

Surveillance and testing activities for the selected safety systems are generally properly performed in accordance with TSR SRs. With one exception (i.e., failing to demonstrate HEPA filter efficiency in accordance with the safety basis performance criteria), surveillance and testing demonstrate that the systems are capable of accomplishing their safety functions and continue to meet applicable system requirements and performance criteria. The procedures implementing SRs are generally well written and technically accurate, and they adequately incorporate the SRs for the selected systems, including appropriate acceptance criteria. Instrumentation and M&TE for the selected systems were adequately calibrated and maintained to support the SRs. Operations personnel performing the TSR surveillance testing were well qualified and performed all tasks consistent with the procedure.

Normal operations are conducted in a manner that ensures the availability of the selected safety systems to perform their intended safety functions when required. Review of the operating procedures indicated they were technically accurate and would achieve required system performance. Operators are trained on specific operations procedures and are knowledgeable of systems design and performance requirements. Observation of the operator shift routines and operating practices indicated the operations personnel are provided with ample opportunity to monitor the operational status of the SCS and PDSS Systems.

CNS has implemented SE oversight at the HEUMF that adequately meets the requirements of DOE Order 420.1C, *Facility Safety*, although some areas of the program are not fully effective. CNS management has identified the safety systems requiring SE coverage and has assigned individuals to those systems SE

involvement in the area of configuration management and operations and maintenance support was acceptable. Implementation of a system health report process at Y-12 was a step toward improved system reliability, but the system health evaluation criteria are not yet comprehensive enough to ensure that the report accurately reflects system health. A training/qualification program has been established, and the SCS and PDSS Systems SEs were fully qualified. However, EA identified a deficiency related to allowing SEs-in-training to perform fully qualified SE functions without proper oversight, contrary to CNS directives. Additionally, EA identified weaknesses with regard to clarity and documentation of certain SE responsibilities.

CNS has established and is implementing feedback and improvement programs and processes necessary for evaluating nuclear safety processes and performance at HEUMF. Feedback and improvement processes were described in program description documents, procedures, and forms. Many assessment and assessment-like activities were planned and scheduled for evaluating programs and performance at HEUMF using a structured process. Assessments were performed and documented as scheduled and in a generally comprehensive and rigorous manner. Safety and improvement issues were identified and entered into an issues management process using a graded approach. Sound causal analysis and corrective action development is guided by process documents and performed adequately. Incidents and events, including those below DOE occurrence reporting thresholds, were formally documented and investigated, and corrective actions were identified and implemented adequately. Internal lessons learned are identified, documented, shared, and, along with external lessons learned, screened for inclusion in work documents and training. Knowledgeable, engaged mission assurance staff and line organization issues management coordinators provided management with guidance and analytical feedback concerning processes and performance, and communicated facility and institutional assurance activities and results adequately.

While feedback and improvement program and implementation reflect an adequate level of effort in many areas, the CNS still lacks the ability to prevent system failures, as acknowledged in the most recent CAS performance report. CNS has chartered a Feedback Improvement Working Group that reviews and analyzes a broad range of inputs and trending data to ensure visibility of significant issues at the level of management (Senior Leadership Team) that is able to direct action and assign appropriate resources.

Although NPO did not identify all the deficiencies noted in this review, NPO has been generally successful in monitoring CNS implementation of the elements of SSM. The NPO SSOR's approach to oversight of the safety significant systems includes both formal assessments and operational awareness activities. In addition, the oversight has been effective at maintaining operational awareness and providing CNS with the appropriate feedback on performance relative to management and operation of the selected safety systems.

7.0 FINDINGS

Findings are deficiencies that warrant a high level of attention from management. If left uncorrected, findings could adversely affect the DOE mission, the environment, the safety or health of workers and the public, or national security. Findings define the specific nature of the deficiency, whether it is localized or indicative of a systematic problem, and identify which organization is responsible for corrective actions. Findings may identify aspects of a program that do not meet the intent of DOE policy or Federal regulation. Corrective action plans must be developed and implemented for EA appraisal findings. Cognizant DOE managers must use site- and program-specific issues management processes and systems developed in accordance with DOE Order 227.1 to manage these corrective action plans and track them to completion. The results section of this report also identifies deficiencies including isolated non-

compliances that did not meet the criteria for a finding. Site processes should be consulted in response to these deficiencies.

Finding-CNS-01: Contrary to 10 CFR 830.205, *Technical Safety Requirements*, the HEUMF TSRs have not implemented all applicable Modes specified in Chapter five of the DSA. In addition, the TSR LCO 3.3 has errors associated with missing or improper condition statements and action statement completion times that have longer durations than allowed by the supporting engineering calculation.

Finding-CNS-02: Contrary to the expectations of DOE Order 433.1B, CNS has not implemented all PM's to ensure reliably of the SCS and PDSS systems.

Finding-CNS-03: Contrary to the expectations of TSR Bases, which specify DOE-HDBK-1169-2003, *DOE Handbook Nuclear Air Cleaning*, Chapter 8, the SCS HEPA filter aerosol testing is not always being performed under actual conditions and at operational airflow for all potential maximum air flow configurations of the SCS.

8.0 OPPORTUNITIES FOR IMPROVEMENT

This EA review identified nine OFIs. These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are suggestions offered by EA that may assist site management in implementing best practices, or provide potential solutions to minor issues identified during the review. In some cases, OFIs address areas where program or process improvements can be achieved through minimal effort. It is expected that the responsible line management organizations will evaluate these OFIs and accept, reject, or modify them as appropriate, in accordance with site-specific program objectives and priorities.

OFI-CNS-01: Consider conducting an assessment of work package quality using DOE Guide 433.1.1-1A, Section F, *Maintenance Procedures*.

OFI-CNS-02: Consider revising and restructuring the procedure that implements SR 4.3.11 for clarity and to consolidate vendor's aerosol testing requirements into the main body of the procedure.

OFI-CNS-03: Consider revising calculation DAC-EE-972082-A036 to include the effects of vortex formation and air entrainment to the fuel intake pipe. Allowance for additional unusable fuel volume is necessary.

OFI-CNS-04: Consider adding a surveillance test to validate diesel fuel consumption for both the diesel driven fire pump and the emergency diesel generator to verify that there is enough fuel for the safety basis required runtime and that the vendor's fuel consumption information has not degraded over time.

OFI-CNS-05: Consider revising the methods that are in place to meet working copy control requirements so that alarm procedures are current and readily available for use.

OFI-CNS-06: Consider implementing better continuing training that follows DOE-HDBK-1118-99, *Guide to Good Practices for Continuing Training*.

OFI-CNS-07: Consider revising Y17-017PD to clarify SE roles and responsibilities to ensure that they are consistently implemented.

OFI-CNS-08: Consider implementing requirements for the conduct and documentation of routine cognizant SE activities to ensure that important system condition and performance information is captured in a retrievable form so trends and associated actions can be taken to improve system reliability.

OFI-CNS-09: Consider reviewing system health criteria to ensure that system health reports are a true reflection of the health of a system and requiring system health reports for VSSs.

9.0 ITEMS FOR FOLLOW-UP

EA will continue to monitor the implementation of the NPO approved and CNS implemented PISA process.

Appendix A
Supplemental Information

Dates of Review

Onsite Review: July 7-10 and August 10-20, 2015

Office of Enterprise Assessments Management

Glenn S. Podonsky, Director, Office of Enterprise Assessments
William A. Eckroade, Deputy Director, Office of Enterprise Assessments
Thomas R. Staker, Director, Office of Environment, Safety and Health Assessments
William E. Miller, Director, Office of Nuclear Safety and Environmental Assessments
Patricia Williams, Director, Office of Worker Safety and Health Assessments
Gerald M. McAteer, Director, Office of Emergency Management Assessments

Quality Review Board

William A. Eckroade
John S. Boulden III
Thomas R. Staker
William E. Miller
Michael A. Kilpatrick

EA Site Lead

Jimmy S. Dyke

EA Reviewers

Jimmy Dyke – Lead
Joe Panchison
Eric Swanson
Glenn Morris

Appendix B
Documents Reviewed, Personnel Interviewed, and Activities Observed

Documents Reviewed

- NPO *Organization Chart*, Revision 11, 6/02/15
- NPO *Nuclear Safety & Engineering (NP0-1 0) Oversight Guide*, Rev. 0, 10/08/14
- NPO *Environment, Safety, Health & Quality Oversight Guide*, 10/14
- *NPO Assistant Manager for Operations Management Oversight Guide*, Rev 1, 8/26/14
- NPO-1.5, NPO *Operating Philosophies And Management System Description*, Rev 2, 10/27/14
- NPO-1.7, *Management Walk-Through Program*, Rev. 0, 6/23/14
- NPO 3.1.2, *NPO Oversight Planning Process*, Rev 1, 10/28/14
- NPO 3.4.1.1, *NPO Oversight Process*, Rev 1, 10/28/14
- NPO-2.2.3.1.5, *Safety System Oversight Qualification Standard*, Rev 0, 10/1/13
- NPO-3.1.3.2, *Safety System Oversight Program*, Rev 1, 6/14/13
- NPO-G-3.1.3.2 *SSO Program Guidance*, Rev 0, 6/17/13
- NPO *Criteria Review and Approach Document (CRAD) For the NPO Self-Assessment on Federal Oversight Activities Team Assessment- August - September 2015*, 8/19/15
- Charter *Y-12 Issues Management Prioritization And Risk Board*, Rev. 20, 10/28/14
- Y14-001, *Conduct of Operations Manual*, Chapter 16, *Technical Procedures*
- Y14-02-011, *Conduct of Operations Supplement - Production Operations*, 1/28/15
- Y15-232, *Technical Procedures*
- Y15-101, *Records and Controlled Documents Manual*
- 9119-F-0002, *Production Surveillance of AOP, EOP, and ARP*, Rev 0, 10/14
- Y11-617, *Employee Concerns Program*
- Y13-87-008, *Conducting Project Reviews*
- Y14-001, *Conduct of Operations Manual*, Chapter 16, Technical Procedures, 5/01/14
- Y14-02-009PD, *Production Senior Supervisory Watch Program*
- Y14-005PD, *Enhanced Floor Surveillance Program Description*
- Y14-004, *Conduct and Documentation of Critique Process*
- Y14-192, *Occurrence Notification and Reporting*
- Y15-004PD, *Configuration Management Program*, 10/23/14
- Y15-232, *Technical Procedures*,
- Y15-101, *Records and Controlled Documents*, 9/30/14
- Y15-312, *Issues Management Process*
- Y15-331, *Lessons Learned Program*
- Y15-902, *Management Assessment*
- Y15-903, *Independent Assessment Program*
- Y15-908PD, *Y-12 Performance Metrics Program*, 5/30/12
- Y15-909, *Surveillance*
- Y17-019, *Walkdowns to Assess Configuration Management, Material Condition, and Aging Issues Associated with Vital Safety Systems*
- Y18-017, *Facility Condition Assessment Survey Program*
- Y18-018PD, *Nuclear Maintenance Management Program*
- Y18-012, *Integrated Work Control Manual (IWCM)*
- Y18-021, *Physical Asset Management Solution (PAMS)*
- Y18-36-002, *Maintenance Tool and Equipment Management*

- Y19-115, *Reporting and Handling Security Concerns and Events*
- Y30-802, *Basic Procurement Instruction*
- Y60-802, *Calibration and Control of Measuring and Test Equipment DOE/NNSA Development and Production Manual, 56XB, Chapter 13.2, Metrology Program*
- Y60-701, *Procurement Quality Manual*
- Y60-503, *Handling, Storing and Shipping*
- Y60-015, *Chapter 5.5 Handling, Storing, and Shipping of Items*
- Y60-138, *Suspect and Counterfeit Item Control Program Operations*
- Y73-170, *Safety and Health Incident and Near-Miss Investigation and Reporting*
- Y73-164, *Subcontract Environment, Safety and Health Management*
- Y-RCM-09-070, *SCS General System RCM Analysis*
- Y-RCM-09-071, *SCS Exhaust System RCM Analysis*
- Y-RCM-09-072, *SCS Isolation System RCM Analysis*
- Y-RCM-07-017, *Safety Significant Power Distribution PDSS RCM Analysis*
- L-2010-OR-BWY12-1102, *Lessons Learned Report - Secondary Confinement System Wiring Issues*, 11/15/10
- RP YAREA-F-472, *2nd QUARTER FY2015 Occurrence Reporting Performance Analysis and Trending for the Reporting Period April 1, 2014 – March 31, 2015*, 4/15
- WD 9119-F-0002, *Production Surveillance of AOP, EOP, and ARP*, Rev 0, 10/14
- WD 972082-SCS-0005, *2014 Vital Safety System Walkdown Observation Report and Reliability Assessment for the 9720-82 Secondary Confinement System*, 11/17/14
- WD 972082-PDSS-0005, *2014 Vital Safety System Walkdown Observation Report for the 9720-82 Safety Significant Power Distribution*, 12/02/14
- WD 972082-SCS-0004, *2013 Vital Safety System Walkdown Observation for the 9720-82 Secondary Confinement System*, 4/01/14
- RP 972082-PDSS-0018, *2013 Vital Safety System Walkdown Observation Report for the 9720-82 Safety Significant Power Distribution*, 12/05/13
- Y/DSA-82, *Documented Safety Analysis for HEUMF*, 11/26/14
- Y/TSR-82, *Technical Safety Requirements for HEUMF*, 11/26/14
- CCN201575334 - *Third Quarter FY 2015 CAS Performance Report*, 8/13/15
- CCN201575474, *Inadequate Surveillance Requirement for Technical Safety Requirement at the Highly Enriched Uranium Materials Facility*, 8/18/15
- CNS-PEP, *CNS Pantex/Y-12 Performance Self-Assessment Report FY 2015 Third Quarter*, 7/15
- 1st Quarter FY 2015 Organizational Health Metric System: Contractor Assurance System (CAS)
- COR-NPO-30 OM-12.15.2014-606179, *Performance Metric Evaluation ofNP0-30 Y-12 Oversight Activities FY-14*, 12/12/14
- COR-NPO-30 OM-6.24.2015-631117, *CNS Abnormal Event Reporting And Investigation Process*, 6/24/15
- COR-NPO-30 OM-7.20.2015-634522, *June 2015 NPO Y-12 Operations Management Quickchecks*, 7/20/15
- COR-NPO-60 ESH-7.10.2015-633395, *NNSA Production Office Quarterly Issues Management Meeting, Report, June 2015*, 7/09/15
- COR-NPO-60 ESH-8.14.2015-638756, *Operational Awareness Roll-Up Report For The Period Of 6/1/2015 Through* 7/31/2015, 8/14/15
- ASM-2013-0035, *Engineering Division Management Assessment of Expert Unreviewed Safety Questions (USQ)*, 9/13
- ASM-2014-0029, *Management Assessment Report Implementation of Quality Assurance Plan for Packaging*, June 2015L-2015-OR-Y12-7644*Human Performance Improvement (HPI) Opportunities from LOTO Activities Reviews*, 8/24/15.

- System Design Description for HEUMF SCS, SDD-MCO-972082-SCS, Rev. 7
- System Design Description for HEUMF PDSS, SDD-MCO-972082-PDSS, Rev. 4
- Standardized Risk Based LCO Completion Times, DAC-FS-900000-A032, Rev. 3
- Technical Basis for DSA-Credited (Minimum) Differential Pressure (dP) Applied to the SCS, DAC-EC-972082-A147, Rev. 0
- Control Settings for Safety Significant Transfer Switches, DAC-EE-972082-A027, Rev. 3
- Safety Significant Generator (GEN2130D) Diesel Fuel Level Requirements, DAC-EE-972082-A036, Rev. 0
- Sprinkler Head Discharge Fluid Collection and Drainage, DAC-EM-972082-A015, Rev. 2
- Lift Truck Fire/Smoke Characterization, DAC-FPD-972082-A004, Rev. 0
- Sequence of Operation Secondary Confinement System, RP-EC-972082-A044, Rev. E
- HVAC Control Diagram, Sheet 4, H2E972082A051, Rev. L
- Safety Significant Generator One Line Diagram, E2E972082A698, Rev. J
- HVAC Secondary Confinement Mode Air Flow Diagram, Sheet 1, H2E972082A130, Rev H
- HVAC Secondary Confinement Mode Air Flow Diagram, Sheet 2, H2E972082A131, Rev G
- *Y-12 Conduct of Operations Applicability Matrix*, 11/19/13
- Y-12 *Organization Charts* (OneSource)
- NPO *Criteria Review and Approach Document (CRAD) For the NPO Self-Assessment on Federal Oversight Activities Team Assessment- August - September 2015*, 8/19/15
- Charter *Y-12 Issues Management Prioritization And Risk Board*, Rev. 20, 10/28/14
- Integrated Facility Assessment Nuclear Facility Warehouses Buildings 9720-5 I 9720-82 Assessment Plan, 5/7/15
- Behavior Based Safety (BBS) Observations

Interviews

- NPO Deputy Manager
- NPO Executive Officer (Acting)
- NPO Assistant Manager for Nuclear Engineering
- NPO Assistant Manager for ESH&QA
- NPO Deputy Assistant Manager for Nuclear Engineering
- NPO Deputy Assistant Manager for Operations
- NPO SSO for SCS and PDSS
- NPO Maintenance SME
- NPO Nuclear Safety Specialist
- NPO Performance Assurance Manager
- NPO HEUMF Facility Representative
- Vice President, Infrastructure
- Manager of Maintenance Execution
- Manager of Maintenance Management & Integration
- HEUMF Maintenance Supervisor
- HEUMF Building Manager
- HEUMF Training Lead
- Manager of Maintenance Programs and Engineering
- HEUMF Craft Supervisor
- Cognizant Systems Engineer (2)
- Engineering Manager
- Maintenance Manager

- Maintenance Training Coordinator
- HEUMF Operations Manager
- Systems Engineering Manager
- HEUMF DSA Engineering Supervisor
- HUMF Shift Manager/Shift Technical Advisor (3)
- Mission Assurance Seth, Vaughn
- Contractor Assurance Manager

Observations

- Tour of SCS and PDSS Systems
- SCS and PDSS Systems Walkdowns with SEs
- 9204-2E System Health Meeting
- FPS Diesel Fire Pump Functional Surveillance Test
- Annual Door Gap and Building Structure Inspection
- SCS Fan PMs
- PDSS PMs
- Plan-of-the-Day Meetings
- Plan-of-the-Week Meetings
- Six Month PM on 200 kW Generator
- Multiple NPO Meetings with CNS Engineering to Discuss Technical Issues
- Integrated Weekly Operations Call (2)
- Issues Management Prioritization and Risk Board
- Final Critique Meeting for Rackable Can Storage Box