Office of Enterprise Assessments
Targeted Review of
Work Planning and Control at the
Y-12 National Security Complex

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Office of Worker Safety and Health Assessments
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Acronyms

AHU	Air Handling Unit
AJHA	Automated Job Hazard Analysis
AL-WP&C	Activity-Level Work Planning and Control
AMOM	Assistant Manager for Operations Management
BWXT	Babcock & Wilcox Technical Services Y-12, LLC
CAS	Contractor Assurance System
CFR	Code of Federal Regulations
CMMIP	Conduct of Maintenance Monitoring and Improvement Action Plan
CNS	Consolidated Nuclear Security, LLC
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
EA-30	Office of Environment, Safety and Health Assessments
ES&H	Environment, Safety, and Health
FR	Facility Representative
FY	Fiscal Year
HA/WI	Hazard Assessment/Work Instruction
HHA	Health Hazard Assessment
HIW	Hazard Identification Worksheet
HRT	Hazard Review Team
HVAC	Heating, Cooling, And Air Conditioning
IH	Industrial Hygiene
ISM	Integrated Safety Management
IWCM	Integrated Work Control Manual
JHA	Job Hazard Analysis
LEV	Local Exhaust Ventilation
LO/TO	Lock Out/Tag Out
NNSA	National Nuclear Security Administration
NPO	NNSA Production Office
OAR	Operational Awareness Report
OEA	Occupational Exposure Assessment
OFI	Opportunity for Improvement
PDSS	Safety Significant Power Distribution
PM	Preventive Maintenance
POD	Plan of the Day
PPE	Personal Protective Equipment
PRB	Project Review Board
PWT	Post-Work Test
RWP	Radiological Work Permit
SIAP	Site Integrated Assessment Plan
SME	Subject Matter Expert
SSC	Structures, Systems, and Components
TWA	Task Work Authorization
WP&C	Work Planning and Control
Y-12	Y-12 National Security Complex

Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent review of activity-level work planning and control at the Y-12 National Security Complex (Y-12). Y-12's primary mission is to support the DOE nuclear weapons stockpile stewardship and management program. Y-12 is managed and operated by Consolidated Nuclear Security, LLC (CNS) with oversight by the National Nuclear Security Administration Production Office (NPO).

EA's review of Y-12 activity-level work planning and control focused on production, maintenance, and construction activities, as well as associated CNS assurance and NPO oversight processes. The EA review of Y-12 was part of a broader EA targeted review of activity-level work planning and control across DOE that partially addresses a DOE commitment to the Defense Nuclear Facilities Safety Board to enhance Federal oversight of activity-level work planning and control.

EA's targeted review found that a rigorous conduct of operations manual and well-defined technical work procedure govern production activities, which are implemented by highly experienced and well-trained staff. Maintenance work control processes are also well defined in CNS procedures. Hazard controls were integrated into work packages, and pre-job briefings and daily crew briefings were used to communicate work scope hazards and controls to skilled and trained craft who conduct maintenance activities. Hazard identification and control selection were integrated in planning for construction work performed by experienced craft. Several processes were used to solicit feedback for improving activity-level work planning and control, and the CNS assurance system was identifying and correcting specific work planning and control deficiencies. For the most part, workers performed the observed work in accordance with site processes and procedures.

However, for observed work, EA identified some weaknesses in hazards analysis and controls for some skill-of-the-craft work, preventive maintenance work instructions, post maintenance testing for some maintenance work, and managing changes to construction work scopes. Most significantly, EA observed several lapses in disciplined operations (adherence to formal documentation and practices designed to minimize the likelihood and consequences of human failures). Specific concerns included not suspending work for an unexpected condition, failure to follow procedures and postings, and inconsistent application of some radiological practices. While none of the actions observed during this review resulted in an injury, environmental insult, or asset damage, past lapses in disciplined operations have had such negative results, and continued lapses present a significant vulnerability.

NPO is appropriately assessing work activities through various means. Of note, NPO had recently identified concerns with disciplined operations at Y-12 and had directed Y-12 to develop corrective actions. In addition, NPO was appropriately working on several areas of improvement for its oversight processes (trending, corrective actions).

While improvements are warranted in various areas, lapses in disciplined operations are the most significant and longstanding concern. While NPO's recent focus on this area is encouraging, effective resolution of disciplined operations concerns will require careful analysis to identify and address underlying organizational behaviors, as well as extensive use of learning opportunities and long term CNS and NPO management commitment and attention. EA plans to follow up on the Y-12 progress in improving activity level work control and planning, with particular focus on disciplined operations.

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1.0 PURPOSE

The U.S. Department of Energy (DOE) Office of Environment, Safety and Health Assessments (EA-30), within the independent Office of Enterprise Assessments (EA), conducted an independent assessment of the Y-12 National Security Complex (Y-12) activity-level work planning and control (AL-WP&C) processes and activities. The onsite portions of the EA targeted assessment were conducted during September 15-18 and September 29 – October 2, 2014.

This independent assessment is part of a larger-scale targeted assessment of AL-WP&C across the DOE complex, including National Nuclear Security Administration (NNSA) sites. EA selected this area for targeted review because of its importance to facility and worker safety and as part of the Deputy Secretary's commitment to enhance Federal oversight of AL-WP&C, which is documented in a response to a Defense Nuclear Facilities Safety Board (DNFSB) letter and Technical Report (DNFSB/Tech-37).

2.0 SCOPE

EA conducted this independent assessment of the AL-WP&C program at Y-12 in accordance with EA's assessment plan, *Plan for the Office of Enterprise Assessments Targeted Review of Work Planning and Control at the NNSA Production Office Y-12*. In order to assess Y-12's performance of AL-WP&C, EA reviewed the documented processes at Y-12, including WP&C procedures, hazard analyses and controls, technical procedures, maintenance work packages, construction work packages, and other WP&C documents; interviewed key Y-12 personnel; observed meetings; and conducted other data-gathering activities. EA focused on observing activity-level work in the areas of production/operations, maintenance, and construction, including the performance of job hazard analyses (JHAs), activity walkdowns, senior management reviews, work authorization activities, pre-job or pre-evolution briefings, execution of work activities, post-job feedback, and contractor assurance system (CAS) activities. The scope of this assessment also included a focused review of NNSA Production Office (NPO) processes for oversight of the contractor's AL-WP&C activities.

3.0 BACKGROUND

The EA program is designed to enhance DOE safety and security programs by providing DOE and contractor managers, Congress, and other stakeholders with an independent assessment 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 EA independent assessment program is described in and governed by DOE Order 227.1B, *Independent Oversight Program*, and a comprehensive set of internal protocols, operating practices, inspectors guides, and process guides.

EA evaluates safety and emergency management policies and programs throughout DOE, with a particular emphasis on evaluating worker and public protection from high consequence hazards that exist at many DOE sites. EA accomplishes its safety and emergency management oversight through two primary mechanisms: (1) a network of staff site leads who are assigned to monitor the activities at DOE sites with nuclear facilities or activities, and coordinate office assessment activities at those sites; and (2) a program of targeted assessments that evaluate selected functional or topical areas at multiple sites across

the DOE complex. Assessment activities are selected, prioritized, and planned based on such factors as risk to workers and the public, facility operational status, and performance history.

Y-12 is operated by Consolidated Nuclear Security, LLC (CNS), which was awarded a five-year contract to manage and operate both Y-12 and the Pantex Plant (Pantex). Contract transition was completed July 1, 2014, when CNS assumed responsibility for operation of both plants. CNS member companies include Bechtel National, Inc., Lockheed Martin, ATK Launch Services, and SOC, with Booz Allen Hamilton as a teaming subcontractor. Y-12 is responsible for uranium storage, processing and manufacturing operation, and production of uranium feedstock for the U.S. nuclear navy, and supports international nuclear nonproliferation programs.

Within NNSA, NPO is responsible for oversight of Y-12. In June 2012, in anticipation of the award of a single management and operating contract for the operation of both Pantex and Y-12, the former Pantex Site Office and Y-12 Site Office were merged into NPO. NPO maintains a cadre of staff at both Y-12 and Pantex.

4.0 METHODOLOGY

EA's *Plan for the Office of Enterprise Assessments Targeted Review of Work Planning and Control at the NNSA Production Office Y-12* identified the criteria to be used to evaluate AL-WP&C. In accordance with the plan, the EA review focused on performance and implementation of site AL-WP&C processes. When performance weaknesses were identified, EA evaluated these weaknesses to identify potential causes.

Appendix A lists the EA personnel responsible for this assessment. Appendix B provides a detailed list of the documents reviewed, personnel interviewed, and observations made during this assessment, relevant to the findings and conclusions of this report.

5.0 RESULTS

At the time of this EA review, all of the previous Y-12 management and operating contractor – Babcock & Wilcox Technical Services Y-12, LLC (BWXT) – procedures had been reviewed and accepted for use (i.e., "blue-sheeted") by CNS, with the requirement that they will be updated at a later specified time. The results of this EA assessment of AL-WP&C implementation are provided by work type, followed by the results of EA's assessment of contractor assurance and NPO oversight.

5.1 Production/Operations

Production work, also known as operational work at Y-12, is performed by Production Operations staff organized across several broad areas of operation, including enriched uranium, special materials and special nuclear materials, assembly and disassembly, and fabrication. EA observed a sampling of work activities performed by staff within assembly/disassembly and fabrication operations. Work observations included disassembly, machining operations, and material handling in several buildings. Associated hazards involved radiation and radioactive materials, as well as physical hazards associated with the operation of machine shop equipment, potential exposure to hazardous chemicals, high voltage, noise, and other physical hazards, such as sharps and thermal hazards.

Overall, appropriate processes have been established at Y-12 to plan and control the conduct of production activities. For most observed activities, the scope was adequately defined, hazards were

analyzed and controls established, readiness was confirmed, work was performed as specified, and feedback was provided for improvement. However, some ancillary activities conducted as skill of the craft were not subject to formal JHAs, resulting in some missed controls. More importantly, EA observed some instances of lapses in adherence to the disciplined operations as prescribed in the Y-12 Conduct of Operations Manual.

Objective: The scope of work is described in sufficient detail to allow the work planning process to identify hazards associated with the work and to develop necessary schedules, priorities and work instructions.

The scope of work for most observed production activities was well defined in technical procedures, Plan of the Day (POD) and Plan of the Week schedules, and JHAs governing individual activities and tasks. In general, technical procedures and JHAs adequately described the scope of work for discrete work activities. Technical procedures include a variety of forms, from continuous use operating procedures and work instructions for more complex activities, to simple one-page Job Performance Aids for routine tasks. Procedures are generally posted or available near the operational activity. Official changes or revisions to procedures are formally tracked and reviewed/updated by crew supervisors in accordance with Y15-232, Technical Procedure Process. For example, EA observed a dismantlement activity that resulted in the need for a non-intent procedure change, which was handled in accordance with the requirements of the Technical Procedure Process.

While technical procedures adequately defined the scope of work for completing specific production activities, EA observed that ancillary activities, such as machine cleaning, that are performed in conjunction with procedures but by skill of the craft of the operator or support personnel, were not included in the scope of activities subject to the associated JHA, resulting in some missed hazards and controls during the work. (See **Y12-OFI-P-1** and discussion below in the Hazard Identification and Analysis section.)

Objective: All hazards that could potentially adversely impact workers, the public, the environment, the facility, and its equipment are documented and analyzed for severity/significance.

Radiological hazards were prevalent for most of the work observed by EA. Most of the production-related processes conducted at the facilities reviewed have not changed significantly in many years; radiological hazards, predominantly the potential for internal exposures to uranium, have been extensively analyzed during that time and are well understood. These hazards continue to be analyzed and evaluated through systematic review of the results of extensive routine air sampling and personal air monitoring, as well as bioassay data. The analysis of this information and any needed changes to radiological controls for existing processes, or the need to analyze new or unusual tasks, occurs using the Radiological Work Permit (RWP) and As Low As Reasonably Achievable review processes.

For non-radiological hazards, the JHA process is the principal hazard analysis mechanism used to identify and analyze hazards at the task level. The JHA process is generally sufficient to identify, analyze, and document work activity hazards. For example, hazards associated with ongoing activities, such as machining and furnace operations, and dismantlement, were adequately identified by sequential work tasks contained in their respective JHAs.

While production work is performed in accordance with technical procedures, some ancillary activities associated with production (cleaning, material movement, replacing coolant, etc.) are performed as skill of the craft. Work planning requirements associated with work scope definition, and hazard analysis and control for these activities, are not well defined. As a result, some activities in production do not have the benefit of a documented activity-level hazard analysis. Some of these observed activities were covered

by a JHA and some were not, because the existence of a JHA depends on the discretion of the specific production group. For example, in assembly/disassembly, a JHA was developed for cleaners, but in uranium machining, there is no JHA for cleaners, although more operations performed by cleaners (not all) in machining are governed by procedure. EA observed several examples of missed hazards and controls during work being performed in this manner. (See **Y12-OFI-P-2**.)

- An individual was observed performing cleaning operations, with his head in close proximity to contaminated machine metal surfaces while bending and reaching under a machine overhang. The RWP for the work did not include a requirement for an anti-contamination hood and/or hard hat to provide head protection. The RWP was subsequently revised to include an anti-contamination hood.
- In the same area, machine chips on the floor were being swept with a broom and collected using a dustpan, for placement into a waste drum; however, a permit applicable to the work area required the use of wet cleaning methods only, and did not address the acceptability of sweeping in the area or ensuring the floor surface was damp during sweeping. Also, handling the chips and drum lid and ring involved potential sharps hazards which could have breached the latex anti-c gloves worn by the worker. Since the activity was being performed as skill of the craft outside the bounds of the machining technical procedure, there was no JHA covering the specific work and hazards. Although the machining procedure did have a precaution regarding use of cut-resistant gloves when there was a potential for sharps, there were no steps either in that procedure or its associated JHA where sharps hazards were expected to be encountered during work.
- The movement and handling of birdcages is a common task for material movement personnel. However, while material handling procedures and associated JHAs applicable to fissile material handling are available, the hazards associated with heavy lifting, such as unstacking birdcages that may weigh more than 50 pounds or moving other heavy objects are not included in the JHAs.

The determination of whether an activity requires a technical procedure is governed by a use-type decision matrix provided in Y15-232, Technical Procedure Process. This matrix requires the development of a technical procedure for all work activities that meet the definition of high or medium risk, as well as when an activity is "low risk and within personnel training but performed infrequently." Activities that are determined to be "low risk and within personnel training and performed frequently" are screened out of the technical procedure process as requiring no procedure. However, the definitions of medium risk, low risk, and personnel training are subjective, resulting in the potential for inconsistent application. For example, personnel training is defined as "Activities that may be performed without written procedures due to apprenticeships or documented training (e.g., written tests, craft knowledge required for advancement, required on-the-job training, training documentation, etc.)." It is not clear from this definition how a supervisor can determine which activities meet the definition since there is no documented hazard analysis or JHA demonstrating that the specific training is sufficient to warrant the lack of a procedure. At Y-12, the JHA process requires that this type of decision be made through the implementation strategy column of the JHA. (See **Y12-OFI-P-3**.)

Objective: Controls are identified and implemented that effectively protect against identified hazards and approved activity-level work control documents can be performed as written.

In most cases, production work uses a combination of engineered controls, administrative controls, and personal protective equipment (PPE) to control hazards. Engineered controls, such as gloveboxes, fume hoods, interlocks, and other design features, are used whenever possible to protect personnel from radiological, electrical, chemical, and other hazards. However, because full material containment was not part of the original uranium production facility design bases, administrative controls, such as operating procedures, operator aids, training, posting, and pre-job briefing requirements, are also used extensively to control hazards. When the combination of engineering and administrative controls is not sufficient for

protection, as is the case for many hands-on work activities with radioactive chemicals, PPE use is required.

The JHA process is the primary mechanism to identify hazard controls at the task level when procedures are used to govern work, and the most common administrative control for production work is the use of technical procedures. Aside from weaknesses noted above, the Y-12 technical procedure process provides a comprehensive system for development, review, approval, use, and modification of procedures. This process also requires that during procedure development or revision, hazards and controls identified in the JHA with a control implementation strategy of "procedure" be included within the document. For the most part, operating procedures governing observed activities were well written and technically accurate, and they contained the appropriate information and level of detail to perform the tasks. The procedures included appropriate precautions, limitations, cautions, and notes to effectively integrate the applicable controls from the Automated Job Hazard Analysis (AJHA) process.

EA observed some weaknesses with implementation of the JHA process in the area of specificity of controls. The controls implementation strategy column of the JHA is intended to ensure that controls identified in the JHA are actually implemented during work; hence, there is a requirement to map each listed control to a specific implementation strategy, such as a specific procedure, the pre-job briefing, a specific permit, or specific training course or qualification standard. The rigor and attention to detail in meeting this expectation was not evident in a number of production JHAs reviewed. For example, while JHAs reviewed provided the appropriate listing of each applicable RWP for each task, other implementation strategies such as training and procedures were often referenced generically, without listing the specific training or qualification course, or procedure number where the control was covered. (See **Y12-OFI-P-4**.)

Objective: Work is conducted diligently in accordance with approved work instructions and within established controls.

Readiness to perform production work is verified on a daily basis using POD schedules, POD meetings, shift manager meetings, and crew briefings and pre-job briefings. A daily POD meeting is held each afternoon to schedule and coordinate activities for the next day. A daily production supervisors' meeting is held at the beginning of each day to validate the plans for the day and reconcile any needed changes from the POD. Crew briefings and pre-job briefings are then held for each work group to review relevant facility information, safety topics, and assignment of jobs for the day. Observed pre-job briefings were thorough, and workers were observed to be engaged and did not hesitate to raise questions or concerns. The EA team noted that production has developed an innovative, tailored pre-job briefing template to guide efficient performance of pre-job briefings. This template includes tailoring the generic form with pre-populated listings of procedures, JHAs, RWPs, specific controls, and worker names, which increases the efficiency and accuracy of information presented during the pre-job briefing.

Most observed production activities were performed in accordance with procedures and existing controls. Operations personnel have significant experience in performing the established production processes and a high level of knowledge in their areas of responsibility. Operations were performed using approved procedures, and administrative requirements and postings were rigidly followed. For example, machinists diligently followed their machining procedure, including completion of required machine checks and completion of a pre-start checklist before using the equipment. Administrative requirements associated with part chain of custody and in process handling and storage were followed as required, and material handlers were observed following the required two-man rule when retrieving materials from storage locations. When performing continuous use procedure steps during furnace operations and dismantlement and lathe operations, EA observed effective use of the "reader worker" method, including repeat backs.

DOE conduct of operations and nuclear safety quality assurance requirements apply to all work activities in the observed production facilities. The Y-12 Conduct of Operations Manual (Y-14-001) defines the institutional expectations related to facility- and activity-level conduct of operations. At Y-12, longstanding weaknesses in implementation of these processes resulted in actions that did not meet institutional expectations for nuclear facility operations and/or did not ensure compliance with Integrated Safety Management (ISM) requirements. While some improvements have been made over the years, during this review, EA observed similar conduct of operations concerns to those previously identified in independent oversight assessments. Specifically, EA observed continuing weaknesses in disciplined operations (adherence to formal documentation and practices designed to minimize the likelihood and consequences of human failures) by both workers and supervision that were contrary to management conduct of operations expectations in the areas of procedure adherence, procedure use, procedure suspension, and radiological control practices. Collectively, these observations indicate that corrective actions to address prior concerns in conduct of operations compliance have not been fully effective in some areas. Specific examples include: (See **Y12-OFI-P-5.**)

- During a dismantlement activity governed by a continuous use technical procedure, operators noticed that the neoprene contact surface on the inside of the lifting fixture had partially peeled away from the metal surface and correctly noted that the condition was in need of repair prior to proceeding. Instead of formally suspending the procedure immediately as required by the Conduct of Operations Manual (because of unexpected conditions and that the lifting steps could not be performed without first correcting the problem), operators and supervision chose to pause and repair the peeled neoprene by applying a contact adhesive. This activity was not part of the continuous use procedure; had not been formally evaluated by industrial hygiene (IH) or engineering; and resulted in improper disposal of the adhesive chemical into the radioactive waste drum, creating mixed waste (later retrieved). Supervision indicated that they had received prior verbal concurrence from engineering to perform this repair if necessary. In response to questions on this approach, it was determined that three similar lifting fixtures were available, and the best approach would be to use a different one. However, it was later determined that there was an error in the technical procedure with respect to the specific lifting fixture referenced in the procedure step. Instead of the actual fixture, the numerical designation pointed to a drawing number, not a lifting fixture, at which point the procedure was formally suspended pending the need for a procedure change. However, this same procedure had been in use for some time without noticing it could not be performed as written.

- During the same job, EA noted a lack of conformance to posted radiological control contamination area boundaries and some poor radiological practices. Examples included:

  - Several individuals broke the plane of the contamination area boundary with their hands.
  - When an unused waste bag fell off of a table inside the contamination area to the floor in the adjacent radiological buffer area, Y-12 personnel did not respond until prompted.
  - A worker in the radiological buffer area, working under an RWP that allowed reaching into the contaminated area with plastic sleeves, was observed crouching and leaning into the contaminated area to obtain a swipe of a waste drum, where there was potential to contaminate personal clothing dangling over the line, as well as exposed skin on the knee which also broke the contaminated area plane.
  - Prior to exiting the contaminated area, the operator was observed tearing his disposable PPE in order to remove it easily.
  - In 9212 M Wing, several breathing zone samplers being worn by workers were not positioned in a manner that would ensure collection of a representative sample (i.e., filter head facing away

from the face or hanging off the shoulder), and radiological control technicians did not notice or correct the sampler placement problems.

- Activities associated with draining coolant from a lathe were governed by a series of steps contained in a continuous use technical procedure. The observed activity was unusual in that it required several iterative draining and refilling sequences to remove contaminants from the machine coolant. During the course of the repeated draining evolutions, the EA team observed that the required step for opening the drain valve and verifying that the coolant flow rate was within the specified range was not performed, although the place keeping entries for this step were being made. When questioned, the workers and supervisor indicated that the step was not necessary because the valve was in the full open position and the coolant flow was within tolerance during the first draining sequence. However, failing to complete each step in a continuous use procedure is not in accordance with conduct of operations requirements. It is also inappropriate to make place keeping entries indicating that a step was completed when it was not actually performed.

Based on EA observations and interviews, the above examples did not reflect willful violations of conduct of operations expectations, but rather a lack of understanding and appreciation as to the potential consequences associated with lack of strict adherence to the requirements.

5.2 Maintenance

Maintenance work is performed throughout Y-12 in both nuclear and non-nuclear facilities, as well as in a number of maintenance shops. Routine maintenance activities include equipment calibration, refurbishment, corrective maintenance and preventive maintenance (PM), and housekeeping. Other maintenance activities involve a wide spectrum of tasks, including predictive and proactive maintenance, post-work tests (PWTs), and emergency maintenance work. Three basic work planning methods are used at Y-12: dispatched work, minor work, and complex work. Dispatched work is predetermined work that falls within the skill of the craft/worker that requires no formal work instructions. Minor work is work that also falls within the skill of the craft/worker, but requires some level of documentation in addition to the scope of work. Complex work is work with increased complexity requiring more detailed work instructions. The EA team observed a number of representative maintenance work activities, including two complex maintenance work activities, three minor maintenance work activities, four dispatched work activities, one maintenance walkdown activity, and a review of five maintenance shops of varying crafts and machine shop equipment.

In general, maintenance polices, manuals, and procedures are well written and address most aspects associated with planning and implementing maintenance. For most observed activities, the scope was adequately defined, hazards were analyzed and controls established, readiness was confirmed, and work was performed as specified. Y-12 has instituted a variety of effective mechanisms for feedback and improvement at the work activity level. However, work scopes, hazards, and controls are sometimes vague or are not always consistent with the work documents; this is particularly evident in maintenance shops and with dispatched work. Hazard controls and qualifications for the use of maintenance shop equipment are not sufficiently identified, documented, and communicated to workers. The Dispatched Work process did not provide assurance that a documented analysis was established for PPE or the quality of post-maintenance testing. In addition, many IH exposure assessments are not current and complete. More significantly, EA identified some examples in which controls or instructions were not being followed.

Objective: The scope of work is described in sufficient detail to allow the work planning process to identify hazards associated with the work and to develop necessary schedules, priorities, and work instructions.

Work scopes for most minor and complex maintenance activities observed by the EA team were well defined in the maintenance work packages. For example, the work scopes for the minor work package for the PM of the EF-604 fan and the complex work package for the PM for the 200KW Safety Significant Power Distribution (PDSS) Generator are well documented in maintenance work instructions, such that hazards and controls can be identified.

Similarly, work scopes for most dispatched work and work performed in the maintenance shops were generally well defined, with a few exceptions. Dispatched work involves a work scope that is predefined such that workers can perform the work using existing skills or qualifications with no specific work instructions. Over 200 predefined work activities have been predefined to qualify as dispatched work (i.e., skill-of-the-craft work activities). The work scope associated with many of the activities, such as "installing 'non-skid' material on steps, platforms, walkways, etc.," is clearly stated in the work definition. However, for some dispatched work, such as "Performing shop work including fabrications and repairs," the work scope is less clear and could involve work activities for which the hazards and controls (that may not have been documented) may be inconsistent with the hazards and controls envisioned when the Dispatch Work Evaluation Committee designated the activity as a dispatch work activity.

In some cases, the EA team observed work scopes that were inconsistent with the work being performed. For example, the work scope for activities performed in maintenance shops is typically defined only in the JHA prepared for the shop. However, some work performed in shops is not addressed in the JHA and, as a result, associated hazards and controls are not identified. For example, in the 9404-5 Paint Shop, most painting is performed within a walk-in paint spray booth that is described in the JHA. However, occasional paint brushing, rolling, and spray painting are performed in other shop areas, and these tasks are not addressed in the JHA. Similarly, the shop equipment maintenance performed in the 9423 Maintenance Shop is not described in the shop JHA. (See **Y12-OFI-M-02**.)

Objective: All hazards that could potentially adversely impact workers, the public, the environment, the facility, and its equipment are documented and analyzed for severity/significance.

For minor and complex maintenance work activities, hazards are typically identified through the Maintenance Planner Checklist/Hazard Identification Worksheet (HIW), the JHA process, or a combination of HIW and JHA. In a number of maintenance work activities, the JHA is used to identify the hazard controls, which are then integrated into the maintenance work instructions. For example, the JHA for the PM of the 200KW PDSS Generator was robust, and included detailed task steps, hazards, and controls. HIWs prepared in support of minor maintenance work activities when the hazards were limited in scope, such as the six month PM on the Enriched Uranium Operations Exhaust Fan EF-3, were typically sufficient to identify the needed hazard controls. However, for dispatched work, neither an HIW nor JHA is required. In lieu of these processes, for dispatched work, one or more of the workers performing the dispatched work must answer a series of five questions on the Dispatched Service Work form that verify workers' understanding of the work scope and work site hazards. All five questions must be answered "no" for the work to proceed as dispatched work, and the responses to the five questions are intended to serve as the hazard analysis. One of the five questions asks, "Does the job require PPE for which I am not trained to wear?" Section 3.3 of the Y-12 procedure for PPE (Y73-116) provides the requirements for performing and documenting a hazard assessment when PPE is used by workers. Appendix B of Y73-116 provides a number of documentation methods for certifying that a hazard assessment has been performed. However, the dispatched work control process, as defined in the Integrated Work Control Manual (IWCM), generally does not meet these requirements for a documented hazard analysis when PPE is used. (See **Y12-OFI-M-02**.)

During this review, the EA team reviewed work activities at five maintenance shops: 9201-3 Mechanical Maintenance Shop, 9404-5 Paint Shop, 9423 Maintenance Shop, 9720-20 General Shop Fabrication and Welding, and 9725 Maintenance Shop. Each of these shops houses a wide variety of shop equipment, including lathes, presses, grinders, saws, pipe threading machines, shear and punch presses, milling machines, sanders, etc. Most of the equipment has been in the shops for decades, and only a few shops were able to produce any of the original operating manuals. Of those manuals found, few included descriptions of machine hazards and controls, unlike comparable operating manuals that would be produced for similar machines manufactured today. A few shop equipment items observed by the EA team identified hazards and controls either on the machine or via signs, postings, or operator aids. The JHAs for all five shops contained insufficient information regarding machine hazards and controls, and none identified hazards and controls tailored for individual machines. Y-12 has no training or qualification requirements or programs for shop machine operators; the only machine hazard training provided is communicated informally through other workers who have used the machine or through the worker's union apprenticeship training that, based on a review of one such program by the EA team, does not provide instruction for the equipment in the Y-12 machine shops. The EA team also observed that, in general, there is no restriction on who may use maintenance shop equipment, providing that the user has read the shop JHA. At the request of the EA team, Y-12 environment, safety, and health (ES&H) conducted a review of Y-12 machine shop related injuries since 2005; ES&H identified 34 related first aid, restricted, lost workday, or recordable injuries, such as a fractured finger and foot, forearm laceration, and inhalation and skin exposure to machine equipment dusts and chemicals. In general, hazards, hazard controls, and qualifications for use of maintenance shop equipment are not sufficiently identified, documented, and communicated to workers. (See **Y12-OFI-M-03**.)

In most of the minor, complex, and dispatched work maintenance observed by the EA team, the potential for worker exposures to physical hazards (e.g., noise), as well as chemical hazards, was present. In most cases, these exposure hazards were identified and analyzed by IH, as evidenced by a review of the JHA and/or involvement of IH in the work scope walkdown. For example, EA observed the walkdown of the upcoming maintenance work activity in Building 9202 to remove unneeded conduit that included an IH technician. Title 10 Code of Federal Regulations (CFR) 851 requires that non-radiological hazards for all activity-level hazards are identified, assessed, and/or monitored and documented. To meet this requirement in part, Y-12 has developed a guidance document, Y73-66-IH-011GUD, Occupational Exposure Assessment (OEA) Guidance, which meets the intent of the 10 CFR 851 requirements and follows exposure assessment strategies developed by the American Industrial Hygiene Association. As stated in the OEA Guide, a purpose of the OEA Guide was to address systematic weakness in exposure assessments outlined in the 2008 DOE *Independent Oversight Special Review of Workplace Exposure Monitoring*. Prior to the issuance of the OEA Guide, Y-12 used similar concepts through the health hazard assessment (HHA) program. Upon review, the EA team found that the OEA Guide has only been implemented on ten percent or fewer of the Y-12 work activities, and the HHA process in many respects is dated and was not applied to all work activities. For example, although the OEA and/or HHA process has been applied to most of the maintenance shops evaluated by the EA team, the process has not remained current with respect to the OEA guidelines. The most recent HHA for the 9423 Maintenance Shop was conducted in February 2009; based on the current Y-12 OEA guidelines, the longest reassessment schedule allowed is 48 months, assuming that hazard exposure ratings are zero (i.e., trivial), which is not the case for worker exposures to some of the hazards in this shop. In addition, the hazards and controls (and JHAs) for some of these shops have changed since the 2009 HHAs were performed. (See **Y12-OFI-M-04**.)

Objective: Controls are identified and implemented that effectively protect against identified hazards, and approved activity-level work control documents can be performed as written.

The IWCM provides guidance and direction for the development and integration of hazard controls in maintenance procedures, work packages, JHAs, etc. In general, for most maintenance work observed by the EA team, hazard controls identified in maintenance work packages were appropriate for the hazard, and controls identified in JHAs were included in maintenance work instructions at a convenient location (i.e., directly prior to the introduction of the hazard). For example, in the work instructions for the performance of the PM of the 200KW PDSS Generator, a hazard control text box identifies the specific controls required for battery work (e.g., Hazard Communication, or HAZCOM, training; portable eye wash; and PPE), directly prior to the work steps associated with measuring and recording diesel battery voltage and amperage. In addition, these controls in the work instructions are consistent with the hazards and controls in the JHA for this activity. In many cases, the specificity of hazard controls in maintenance work instructions has improved since the 2008 Independent Oversight review. For similar diesel PMs in 2008, the identification of hearing protection requirements may have previously indicated "as applicable," but for this work instruction, the hearing protection requirements are quite specific and identify the hearing protector requirements (i.e., a minimum noise reduction ratio of 29 decibels), as well as listing ten acceptable hearing protectors that would meet these requirements.

Although many hazard controls were adequately identified, developed, and implemented, EA noted some exceptions: (See **Y12-OFI-M-06)**

- In shop 9720-20, cans of mercury vapor lamps and lead acid batteries were stored in a section of the shop, but there were no postings or floor markings to ascertain whether such material should be stored in this location, along with combustibles and hearing protection devices, or whether such material could be stored in any shop location.
- In the 9725 shop, two pedestal grinders were posted "full face shield required," but no such signs were posted on similar grinders in the 9720-20 shop.
- The JHA for the 9201-3 Maintenance Shop requires that "maintenance/noise areas shall be posted as Noise Area-Hearing Protection required," but no such postings were observed by the EA team.
- During observation of the PM of the 200KW PDSS Generator, EA noted ambiguous instructions for a structures, systems, and components (SSC) Grade 2 equipment item, for which all work instruction steps were to be performed in sequence and as written. Step 3.25 required the performer to check whether the engine coolant temperature was "elevated" and denote in the work instructions "SAT" or "UNSAT;" however, no temperature acceptance criteria or definition of "elevated" was provided, and the workers lacked consistent understanding of the term "elevated."

The EA team also identified some concerns with equipment calibration programs. For example: (See **Y12-OFI-M-05**.)

- There is no Y-12 calibration program for the infrared thermometer used in the 200KW PDSS Generator PM or other maintenance PMs, although such calibration processes are typically available by the manufacturer.
- In one PM, an un-calibrated infrared thermometer is used to determine whether a fan's bearing surface temperature is acceptable, whether one should proceed with caution, or whether the equipment should not be operated at all.
- In most observed maintenance shops, labeling of ventilation calibration of local exhaust ventilation (LEV) snorkels used for welding was non-existent, confusing, and/or inconsistent with similar snorkels in other shops, such that a worker could not readily confirm whether the LEV snorkel was operational. For example:

- A LEV snorkel in 9720-20 was provided with a calibration label that was not legible.
- The LEV snorkel in the 9423 Machine Shop had no calibration sticker, but the documented "Welding Snorkel Performance Check" for the hood indicated the calibration was overdue since 5/11/2014.
- The calibration sticker on the LEV snorkel in the 9725 Maintenance Shop indicated "checked 12/23/13," inferring that the unit was in calibration although the calibration frequency was only six months.

Objective: Work is conducted diligently in accordance with approved work instructions and within established controls.

Chapter 6 of the IWCM describes the process by which maintenance work is to be performed, consistent with the requirements of the Conduct of Operations Manual. The EA team observed that, in general, pre-job briefings and morning crew briefings were informative, addressed the hazards and controls of the upcoming work activities, and utilized effective worker communication techniques such as "repeat-backs." Examples of noteworthy pre-job and morning crew briefings included a pre-job/morning crew briefing provided by the 9720-20 Maintenance Shop supervisor, pre-job briefings provided by a maintenance supervisor in preparation for security dispatch maintenance work, and the pre-job briefing provided by the maintenance supervisor in preparation for the PM for the 200KW PDSS Generator. In most work observations, the EA team observed work being performed in accordance with maintenance work instructions, and documented JHAs and HIWs. However, EA noted some exceptions.

The EA team observed some instances in which workers and their supervisors did not perform work in accordance with posted signs and/or requirements in JHAs. For example: (See **Y12-OFI-M-06**.)

- In the 9720-20 Maintenance Shop, four electrical panels could not be readily accessed because they were blocked by shop materials, even though a sign was posted on each electrical box requiring 36 inches of clearance.
- A similar blocked electrical panel was found in the Building 9725 shop, although the required 36 inches of clearance was well posted.
- In the 9720-20 shop, three shop workers were observed using a noisy threading machine without hearing protection, although a posting was provided at the shop entrance requiring that hearing protection be worn when operating shop equipment.

The EA team identified another concern regarding dispatch work activities that involve intrusive corrective maintenance being conducted without the performance of a PWT as required by the IWCM. For example, a corrective maintenance activity to replace a gear box assembly and barrier pin in a vehicle security barrier did not include a documented PWT as required by the IWCM. According to Y-12 maintenance procedures, a PWT is required after intrusive maintenance, i.e., maintenance that impairs the proper functioning of SSCs. The replacement of the gear box assembly was an intrusive activity, as later confirmed by Y-12 maintenance management, and the PWT requirements of Y18-012 should have been followed. In planning a PWT, Y12-018 also requires answering a set of ten questions on the UCN-21278 PWT, which may result in the need for an additional review of the work activity by the system engineer or equipment owner. This activity was not performed. (See **Y12-OFI-M-07**.)

On several occasions, the EA team observed that workers and their supervisors did not follow the requirements of their work instructions as written. For example: (See **Y12-OFI-M-06**.)

- Maintenance workers were performing a six-month PM on a lung counter sliding door; this minor maintenance activity included a note at the beginning of the work instructions that stated, "the following job steps shall be worked in order as written." Four of the work steps in the work instructions required the unit to be operational in order to complete the work step. However, since the unit had been locked out, the steps could not be performed. The workers indicated that the steps were "UNSAT" in the work instruction (since they could not be performed), a note was entered by the workers in the feedback and improvement section concerning the issue, and the PM proceeded with the remaining steps. Proceeding with the work steps was in contradiction to following the job steps in order and as written, and required the craft to evaluate the importance of the work steps not performed without the benefit of input from the system engineer or system owner.
- During the PWT portion of the annual PM of a roof fan EF-604, the "Job Supervisor/Craft" were to "verify that the fan louvers open freely." Although this exhaust fan was equipped with operable louvers, the louvers had been purposely fixed during a previous maintenance activity and could not be moved. During the performance of the PM, the craft skipped this step of the PWT and concluded that the PWT was "SAT" without pausing the work or contacting the system engineer/owner, although the workers indicated in the feedback section of the work instructions that the "louvers were fixed down."
- Also associated with the previously discussed PM of the 200KW PDSS Generator, workers were required to assess whether temperatures were "elevated" without temperature acceptance criteria or a definition of "elevated."
- In August 2014, an NPO Facility Representative (FR) observed a similar scenario of not following work instructions as written during the dismantlement of a walk-in hood fan belt change-out. During the work observation, the NPO FR noted that "although the work package prescribes the work to be performed as detailed; in discussion with the supervisor a note could be added to allow the knowledgeable craft personnel to determine if further testing is needed, but in the current condition of the work package it does not allow for failure to complete the steps." Furthermore, in the July 2014 NNSA Production Office Quarterly Issues Management Meeting notes, NPO "identified a number of events that are indicative of immature performance culture or disciplined operations." NPO also indicated in the same report, with respect to the Y-12 safety culture, that "a common theme observed by NPO is that these events involve workers accepting risk at the floor level providing a strong indication that management has created a work environment where risk acceptance is not only tolerated but rewarded."

5.3 Construction

Within the CNS organization, Construction Management is part of the Y-12 Projects Management Division, which falls within the Directorate of Infrastructure and Projects Management. Construction Management is responsible for performing most plant modifications and project work. EA observed seven direct-hire construction jobs: 9720-26 facility upgrades; 9202 development atomizer project; 9204-2E kathabar removal project; 9212 process condensate; 9744 demolition; Stack 110; and 9995 heating, cooling, and air conditioning (HVAC). Other activities included attending a hazard assessment/work instruction (HA/WI) walkdown, a Project Review Board (PRB) meeting, a Construction Management weekly project safety walkdown, a kickoff meeting for the 9744 demolition project, and a Project Manager's walkdown of a construction project.

The Construction Management process for accomplishing work is described in a suite of procedures, some of which refer to outdated references and need to be updated. Construction Management appropriately utilizes integrated teams for AL-WP&C, and has effective feedback and improvement mechanisms. For observed activities, the work scope is provided in project execution plans or Task Work Authorizations (TWAs), and in the HA/WI to analyze hazards and specified controls. However, in some instances, these documents were not updated to reflect changes in scope. Pre-job briefings were effective in reviewing hazards and sharing lessons learned prior to the start of work. Multiple methods were used to provide feedback and improvement.

Objective: The scope of work is described in sufficient detail to allow the work planning process to identify hazards associated with the work and to develop necessary schedules, priorities, and work instructions.

The work scope for observed construction projects is adequately described in project execution plans, functional and operational requirements, drawings, and other project deliverables. The Building 9744 demolition work scope was described in the demolition plan, including a project scope summary, utility isolations, and drawings. The HA/WI also defined the work scope in greater detail. For another project, the Building 9995 HVAC Project Execution Plan was revised in June 2014 to remove the air handling unit (AHU) 2000 scope and subcontract portions of the AHU 1000 work; however, the HA/WI work scope, which was revised in August 2014, still included both AHU unit 1000 and AHU unit 2000 as direct-hire work. When asked about this inconsistency, the construction representatives considered it conservative to keep the scope in the HA/WI, in case a decision was made to go back to the original plan. EA observed other instances in which the HA/WI was not updated to reflect additional scope (e.g., 9212 process condensate ductwork). (See **Y12-OFI-C-1**.)

The work scope for the Stack 110 work was adequately described in Appendix A, Detailed Project Scope, of the Project Execution Plan for the Nuclear Facility Risk Reduction Project. For special construction work, which includes customer-required work that does not have an assigned project manager, a TWA is used to document the acceptance of scope, budget, and schedule for the requested work. The TWA for the Kathabar Demolition adequately specified the authorized scope of work to include demolition of the kathabar equipment, along with mechanical and electrical services, and referenced design drawings and an electrical work instruction. A TWA was also used to authorize improvements to Building 9720-26. The scope for this improvement project was increased several times using trend notice forms to obtain authorization, and the HA/WI was revised to reflect the newly added work scope. The 9202 development Atomizer Project was also special construction work; however, this work was treated like a project, with an assigned program manager, equivalent documents, etc. The work scope was adequately defined in the TWA and associated drawings.

Objective: All hazards that could potentially adversely impact workers, the public, the environment, the facility, and its equipment are documented and analyzed for severity/significance.

Construction uses the HA/WI process to identify and assess hazards. When the work scope has been defined and the preliminary job steps are known, the Construction Manager will issue an HA/WI request to initiate the hazard identification and control selection process. A hazard review team (HRT), including craft representatives, construction superintendent, field engineer, ES&H subject matter experts (SMEs), and other representation as appropriate, is formed. The HRT conducts a walkdown of the job site, using an HA/WI walkdown checklist to assist with the identification of hazards and possible controls. EA observed an HA/WI walkdown of a project to install and test a new flow test header and associated new pipe and components for Building 9723-34. The HRT included appropriate representation from project management, safety, engineering, and craft. The Craft Safety Representative led the review, using the HA/WI walkdown checklist. The sprinkler fitter described the anticipated methods for accomplishing the

work, and the team identified a number of hazards. Potential controls were also listed, and stop work authority was discussed. EA reviewed numerous project-specific HA/WI documents, and all involved an integrated HRT, which is an effective method for ensuring that workers and ES&H SMEs are involved in the hazard identification process.

The HA/WI includes a listing of required worker training and medical requirements, applicable permits, prerequisites, and common construction and work place hazards and controls. The HA/WI for the 9202 work appropriately included prerequisites for IH, fire protection, radiation control, and waste management. The job steps, potential hazards, and control measures are identified for the various work activities. The job steps are at the activity level (e.g., "set up crane", "remove insulation"). Potential hazards for the 9202 work include exposure to hazardous materials, uncontrolled chemical storage, obstructed egress, radiological contamination, excessive noise, overhead utilities, hoisting and rigging, defective crane, defective rigging equipment, falls, etc. The HA/WIs cover all of the work scope and, therefore, can be extensive. Additionally, the HA/WI coordinator documents the chemical hazards and control measures associated with the work on form CFN-0223, which is attached to the HA/WI. Common construction hazards are discussed in the Safety Handbook for Direct-Hire Construction, a copy of which is provided to each employee. Each project reviewed had an approved HA/WI or JHA that included the applicable hazards and control measures for the scope of work reviewed.

Objective: Controls are identified and implemented that effectively protect against identified hazards, and approved activity-level work control documents can be performed as written.

Controls are identified as part of the HA/WI process. Procedure Y17-64-321, Construction Hazard Assessments and Work Instructions, provides guidance for the selection of controls based upon an appropriate hierarchy (elimination/substitution of hazard, engineering methods, administrative controls, then PPE). The procedure includes a table of hazards and potential controls, as well as a table of administrative controls, that are part of the HA/WI walkdown checklist. The job steps, potential hazards, and controls are listed on the HA/WI, which serves as the activity-level work control document. The HA/WI also includes a listing of chemical hazards and control measures. The Safety Handbook for Direct-Hire Construction includes a table of common construction and workplace hazards and control measures. Controls are also identified through the permitting processes, such as RWPs, asbestos removal authorization, etc. The HA/WI for the 9202 project included permits for asbestos, beryllium work, penetration, hot work, lock out/tag out (LO/TO), and RWP. Some of the controls from these permits were specifically included in the control measures of the HA/WI (e.g., medical restrictions for beryllium, additional PPE for asbestos-containing material), whereas others simply point to the permit (e.g., RWP) for controls. The HA/WI is written for the entire project work scope and is not tailored for the daily activities, thus it is not evident from the HA/WI which hazards and controls are relevant for each day's work. CNS Construction has a new initiative, the Safety Task Analysis and Risk Reduction Talk process, defined in procedure Y17-64-322, which should result in increased awareness and focus on daily activities. (See **Y12-OFI-C-2**.)

Construction work activities are not covered by technical procedures. The workers are journeyman-level craftsmen and are under the supervision of construction superintendents. EA interviewed the training officer for project management. When the workers are badged, they are entered in the training system. A baseline training list has been established for each of the crafts. For example, construction insulators are required to take courses for scaffold use, temperature extremes, hearing protection, aerial life operator, LO/TO, respirator wearer supervisor level, and the 32-hour asbestos workers training, in addition to Y-12 employee training requirements. Additionally, the workers are all provided a copy of the Safety Handbook and are trained on job-specific HA/WIs. The training histories for a construction pipefitter and a construction operator were reviewed and determined to be consistent with job requirements.

Objective: Work is conducted diligently in accordance with approved work instructions and within established controls.

The process for accomplishing the construction direct-hire work is described in procedure Y17-64-302, Execution of Direct Hire Work. For project work, the start of field work is authorized by a PRB, which includes the project manager, construction manager, ES&H SMEs, and other representatives as appropriate. The review is documented on a Projects Field Work Authorization Checklist, which addresses project, engineering, safety, construction, and quality concerns. Limitations and hold points are identified. EA attended a PRB for the 9215 O-Wing cleanup project. The meeting attendees thoroughly discussed all aspects of the project and identified several hold points. After the PRB has approved work start, the construction superintendent is responsible for ensuring that the work is scheduled on the facility's POD or plan of the week, and must obtain concurrence from the facility manager prior to beginning work. EA observed the POD for 9202 development, and noted that the construction activities were well integrated in the POD.

Construction holds a project kickoff meeting prior to starting field work. EA observed a kickoff meeting that was held prior to the beginning of work for the 9744 demolition project. The construction superintendent went through the demolition plan and highlighted safety, health, and environmental concerns and controls. Stop Work authority was emphasized. Responsibilities were assigned, and appropriate PPE was discussed, as well as radiological control and IH support during the demolition activities. Restrictions for entering the building were also discussed, as was the use of a spotter for the overhead 13.8 kilovolt line. EA observed good interaction of the workers, SMEs, managers, and technical support.

The construction superintendent conducts daily pre-job and post-job briefings. Procedure Y17-64-302, Execution of Direct Hire Work, includes Job Brief Form CFN-0076, which covers both the daily pre-job and post-job brief. The form includes reference to the HA/WI or JHA to be used for that day; post-job feedback from the previous day's work; the specific tasks, hazards, and controls to be performed for the day; an interactive discussion segment; and a sign-in sheet. EA observed the job briefs for six construction jobs. The construction superintendents were knowledgeable and experienced, and ensured that the workers were aware of the specific hazards and controls for that day's work. An example of an excellent briefing was the 9212 condensate project. During that briefing, the construction superintendent focused on the day's scope of work (welding); the required PPE, including respirators; and the need for hot work permits, control of combustibles, and fire watches. He also addressed two applicable lessons learned; reminded workers of recent issues with respirators and reinforced the need to check their respirators; and discussed a burn to a welder, which resulted from wearing the wrong gloves and using a combustible tape. The construction superintendent also addressed a potential hazard that had been identified by a worker, but was not included on the HA/WI. A copy of the HA/WI and the Job Inspection Package were located at each job site, as well as a copy of the Construction Safety Handbook. A review of the HA/WIs confirmed that the workers had received training on the document. However, a walkdown of the jobsite is not required prior to daily work start. (See **Y12-OFI-C-1** and **Y12-OFI-C-2**.)

5.4 Contractor Assurance

Objective: The WP&C processes are routinely evaluated by the Organization's Contractor Assurance System and feedback and improvement processes and lessons learned are adequately captured and incorporated into the planning and performance of ongoing and future work activities.

EA reviewed processes used to facilitate learning from and improving AL-WP&C activities, including the collection and utilization of feedback after completion of activities and AL-WP&C focused assessments. Overall, EA found that for operations, maintenance, and construction, several methods were being used to

collect feedback and facilitate improvements to future activities. In addition, assessments were being conducted that identified performance-based deficiencies, which were then being managed by the issues management process. At the time of the review, CNS also had a number of ongoing initiatives to improve AL-WP&C. Although a number of these initiatives (Senior Supervisory Watch, Conduct of Operations Training for crafts) were focused on conduct of operations, this EA review, recent correspondence from NPO, and data from the CNS Safety Culture Dashboard all indicate that lapses in conduct of operations still exist and that additional effort is needed to fully understand the organizational behaviors leading to these lapses. (See **Y12-OFI-1**.)

The production organizations reviewed during this assessment have established and implemented a number of mechanisms for collecting activity-level feedback and using that input to make ES&H improvements. A cornerstone of this effort is the inclusion of specific requirements for post-job reviews. The pre-job briefing form includes specific requirements for a post-job brief and also requires workers to separately initial for attendance at both the pre-job and post-job briefs. Meetings are often prefaced with a safety and security topic. There is also evidence that lessons learned are incorporated into pre-job briefings and all-hands meetings, which are held periodically in each facility. An all-hands meeting, conducted in one building during the EA assessment, reviewed some of the concerns raised with respect to poor radiological practices and expectations for proper performance.

The IWCM describes the processes and tools associated with performing a critical analysis of maintenance work to ensure that issues, improvements, or lessons learned are identified and incorporated into subsequent work. The EA team observed that at the work activity level, post-job debriefs, end-of-day crew briefings, and the completion of a Feedback & Improvement form for every minor or complex maintenance work package were effective mechanisms to capture worker feedback. In addition, the Maintenance Department now has two craft workers serving as roving full-time safety representatives to identify and investigate concerns raised by the maintenance crafts.

Historically, the Y-12 Maintenance Department has been challenged in reviewing completed Feedback & and Improvement forms (which average 1200 completed forms per month), responding to the feedback and improvement comments on a timely basis, and trending the results obtained from these forms. However, during the past six months, improvements in this process have been evidenced as a result of increased staff within the Maintenance Program Engineering Department, which is dedicated to processing work package Feedback & Improvement forms, improved communications between the Maintenance Engineering and System Engineering Departments, and the establishment of System Health Managers and Equipment Owners for SSC accountability and operability status. The EA team observed through interviews with workers that the improvements were noticeable, and as a result, workers were now more likely to provide additional rigor when completing Feedback & Improvement forms.

Another positive feedback and improvement program within the Y-12 Maintenance Department is the ongoing Conduct of Maintenance Monitoring and Improvement Action Plan (CMMIP). The CMMIP was developed to provide recommendations for improvements to the work planning, control, and scheduling programs. As of April 2014, 40 of the 62 action items had been completed, with the remaining action items scheduled for closure prior to the end of fiscal year (FY) 2014. Maintenance improvement initiatives currently underway include training for leaders, planners, and craft; providing a prototype software package to perform cursory reviews of minor and completed work packages to enable “error free” completion of work packages; and developing a Skill of Craft index to provide a general description of craft skills available at Y-12 to assist work planners in the preparation of work packages. Maintenance Control Center Leads were also conducting reviews of all work packages to facilitate improvements. A checklist had been developed to facilitate these reviews, and data resulting from the reviews was being trended on overall performance and the types and quantities of issues. Although these reviews provide feedback to help drive improvements, the reviews have not always been performed consistently, and it is

premature to draw any conclusions about the overall effectiveness of this new mechanism or the performance trends.

Construction uses several mechanisms to obtain feedback from the workforce, including pre- and post-job briefings, HA/WI walkdowns, weekly construction safety walkdowns, construction safety representatives, kickoff meetings prior to work start, weekly safety supervisor meetings, and weekly safety toolbox meetings. EA observed several of these activities and noted good interaction among the workforce. Construction has effectively used integrated teams comprised of managers, engineers, ES&H SMEs, and craft representatives to enhance AL-WP&C activities. For example, during the weekly construction safety walkdown of the construction shops, a CNS team comprised of construction safety SMEs, craft safety representatives, and craft representatives walked down the carpenters shop, pipefitters shop, ironworkers shop, and sheetmetal work area. The shops have instituted the 7S process, which is a methodology from Lean Manufacturing that aims to optimize the physical workspace, resulting in neat and orderly work areas. The CNS team identified several safety improvements (portable eyewash stations, a saw-stop table saw, improved ventilation systems, etc.). During the walkthrough, one of the team members walked past a restricted area posting and was immediately corrected by the team members. As a result of this review, a post and chain barricade with a posting was placed in front of the sheetmetal work area entrance. Over 30 audits/assessments/surveillances were conducted of construction activities in 2014, providing additional opportunities for feedback and improvement. During each of the daily briefings observed, the construction superintendent solicited feedback for the post-job briefing. This input is recorded on the briefing sheet, which is turned in to the general superintendent. The construction superintendent addresses the issues that can be readily fixed, and the longer-term items are carried on a deficiency list. This feedback is not trended. (See **Y12-OFI-C-3**.)

A lessons learned is discussed in each weekly safety supervisor meeting. A member of the EA team attended one of the weekly safety supervisor meetings, and also reviewed the handouts for ten weeks of meetings. During each meeting, a lessons learned was presented, and weekly safety statistics were discussed. These meetings are well attended, and the lessons learned for that meeting is disseminated to the rest of the workforce during the toolbox meetings on Monday mornings. Lessons learned are required to be developed as part of the project management process, and construction provided several examples of lessons learned. Also, construction has generated four lessons learned reports. Additionally, the HA/WI procedure references the use of lessons learned during the identification of hazards, and procedure Y13-87-004 requires the review of lessons learned from previous projects during project planning and preparation of the Project Execution Plan, and also requires the development of lessons learned in the final closeout report.

Y-12 performs four types of assessments: facility evaluations, independent assessments, independent surveillances, and management assessments and surveillances. EA reviewed a sample of AL-WP&C assessments and surveillances and found that they included assessment of performance of specific activities, and identified issues for entry into the issues management system. EA reviewed a sample of issues and verified that they were appropriately entered into the site issues management system. EA also reviewed a sample of closed issues and found that the supporting documentation provided sufficient information to justify closure of the specific deficiency. CNS is making progress on actions to implement the Conduct of Maintenance Monitoring and Action Improvement Plan to improve WP&C, with completion scheduled by the end of FY 2014. Data on Maintenance Center Lead reviews of work packages appeared to indicate progress in improving the quality of work packages. While these reviews can contribute to improvements, site personnel said that the reviews had only limited usefulness in gauging performance because of their variable quality.

5.5 NPO Oversight

NPO is conducting a significant amount of oversight activities that evaluate multiple elements of AL-WP&C. The NPO FRs and maintenance and ES&H SMEs are actively involved in conducting oversight of AL-WPC and contribute to the majority of oversight activities. NPO applies some basic trending analysis to identify potential areas of concern. However, the trending analysis appears to be focused more on lagging indicators instead of leading indicators. The oversight results being identified by NPO have resulted in the identification of key initiatives to focus additional CNS resources on areas with persistent low performance. Current key NPO initiatives (disciplined operations, maintenance, radiological protection) encompassed most of the deficiencies identified by EA. Due to the low performance, NPO prepared formal correspondence directing the contractor to evaluate the causes for the problems in operational discipline and provide a path forward to address the systematic problems.

Criteria: Effective oversight processes have been established and implemented with respect to AL-WP&C.

The NPO management processes to implement line oversight are defined in NPO Procedure NPO-3.4.1.1, NPO Oversight Process. The NPO LO approach is risk informed through feedback from the evaluation of identified issues and review of the CAS. The NPO line oversight approach includes both formal assessments and operational awareness activities.

The NPO Functions, Responsibility, and Authorities Manual identifies the Assistant Manager for Operations Management (AMOM) as the lead organization responsible for line oversight of AL-WP&C. The responsibility includes working collaboratively with other Assistant Manager organizations to evaluate the contractor's programs to analyze hazards and ensure scope of work is adequately defined. At NPO, the majority of line oversight for AL-WP&C occurs through operational awareness activities by the FRs and maintenance and ES&H SMEs. The FR and maintenance SME operational awareness activity is documented on a quick check form and electronically stored on the NPO SharePoint Site. The ES&H SMEs document their operational awareness on operational awareness reports (OARs), which are also electronically stored on the NPO SharePoint Site. EA noted the field presence of an FR, the environmental SME, and a Federal Project Director during this review.

Interviews with NPO oversight staff indicated that personnel were knowledgeable of the NPO oversight process and implementing mechanisms. In addition, the NPO oversight staff was knowledgeable of AL-WP&C processes and how the oversight being conducted by their organizations was related to evaluating implementation of AL-WP&C. Review of the quick check and OAR documentation indicated that NPO staff members were evaluating the elements of AL-WP&C and are properly capturing identified deficiencies. During FY 2014, FRs, and maintenance and ES&H SMEs, completed over 500 OA activities, and each activity covered at least one or more elements of AL-WP&C.

In addition to operational awareness activities, NPO personnel conduct oversight and shadow assessments of the contractor operations, facilities, and programs. NPO prepares the Site Integrated Assessment Plan (SIAP) at the beginning of each FY to identify the planned assessments. The NPO development process for the SIAP uses multiple inputs, which include consideration of input from the Assistant Managers, recommended areas for assessment, DOE directive mandated assessments, and evaluation of the contractor's performance in a given oversight area through application of a risk ranking process. Review of the FY 2014 SIAP indicated that the process was appropriately followed and that the assessments identified were appropriate for the documented issues being reported on the contractor's performance.

A review of the completed assessments for FY 2014 indicated NPO generally fulfilled the expectations of the SIAP; however, some assessments were not completed due to a multiple-month transition of the Y-12

contract to a new management and operating contractor, and movement of NPO personnel to backfill open positions brought on by normal workforce attrition. The assessments reviewed were of acceptable quality and contained formal review criteria that were addressed through observations of field activities. During the contract transition, NPO switched their oversight focus to the contractor's transition activities. Therefore, the majority of AL-WP&C oversight conducted in FY 2014 was in the form of operational awareness activities captured in quick check forms. The AMOM conducted approximately 480 quick check forms evaluating operations and maintenance activities in FY 2014. The quick check forms completed in FY 2014 identified approximately 90 issues. NPO provided correspondence indicating that the approximately 90 issues were formally transmitted to the Y-12 contractor. One recent outcome of the NPO oversight efforts was the identification of a negative trend in the contractor's operational discipline in performing daily work activities. As a result, NPO prepared formal correspondence directing the contractor to evaluate the causes for the problems in operational discipline and provide a path forward to address the systematic problems.

NPO applies some basic trending analysis to identify potential areas of concern. However, the trending analysis appears to be focused more on lagging indicators instead of leading indicators. NPO has identified a need to use additional expertise to improve trending.

In FY 2012, DOE realized that improvements were needed in Federal oversight of AL-WP&C. To improve Federal oversight, DOE established a special emphasis area and provided plans for oversight of AL-WP&C at DOE sites to the DNFSB. Specifically for NPO, DOE committed to the following actions in FY 2014:

- Perform at least 150 maintenance QCs.
- Perform two in-depth FR and maintenance SME team assessments on AL-WP&C using Energy Facility Contractors Group guidance.
- Perform seven AL-WP&C shadow assessments.

EA's review of NPO oversight documentation indicated 123 of the 150 quick checks were completed, and 11 shadow assessments evaluating aspects of AL-WP&C were completed. However, NPO missed an opportunity to continually improve Federal oversight of WP&C at Y-12 by not completing the two in-depth FR and maintenance SME team assessments. (See **NPO-OFI-01**.)

NPO has implemented an issues management system to ensure resolution of identified issues. Currently, NPO is actively addressing a self-identified concern that the NPO issue management system is inadequate to effectively manage Federal and contractor issues at the two sites. NPO is planning to implement a new issues management procedure to address the management concern. The current issues management process at NPO assigns the responsibility to each Assistant Manager to track their identified issues to closure. Each Assistant Manager formally transmits their identified issues to the contractor and tracks the issues to closure through formal correspondence. The current NPO issues management process is not ideal for socializing issues across the NPO organization, which would allow for a more robust resolution of issues and the identification of cross-cutting issues. NPO has implemented the following corrective actions to improve their issues management system and ensure issues are communicated to NPO senior management:

- NPO has recently established an effective communication process through the integrated weekly operations call to integrate oversight results from each NPO organization and allow for identification of cross-cutting issues.

- NPO established the Quarterly Issues Management Meeting, which provides an effective and efficient approach to evaluate the contractor's CAS results against the NPO oversight results, and provides timely feedback to the site contractor on the CAS effectiveness.

6.0 CONCLUSIONS

The Y-12 AL-WP&C processes and procedures for production operations, maintenance, and construction appropriately include hazard identification, analysis and controls selection, safe execution of work activities, processes for work planning and approval, processes for work start and performance, and feedback and improvement. The work scope elements and associated boundaries are well defined for production/operations work that is covered by technical procedures, maintenance work that is minor or complex, and construction work. Processes have been developed to integrate work among the organizations. Hazards identification and analysis processes are defined and allow for a graded approach. The development and integration of hazard controls into operations and maintenance work documents were adequately described. The processes for performing work were detailed and provided specific direction, as well as roles and responsibilities. Feedback and improvement processes are adequately defined at the corporate level with the CAS, and at the organizational level. EA identified some concerns with regard to the lack of defined processes for maintenance dispatched work, and operations work that is not covered by technical procedures.

For observed activities, the work scope was generally well defined in technical procedures, work packages, HA/WI, POD/plan-of-the-week meetings, and project documentation. The processes used to analyze activity-level work (i.e., JHA and HA/WI) are generally sufficient to identify, analyze, and document work activity hazards, and to identify controls. The HA/WI process used an integrated team to walk down the jobsite and identify hazards, mitigations, and controls. Work start was appropriately coordinated with the facility managers. The pre-job briefings were an effective method for communicating to the workers the daily job tasks and associated hazards and controls. The EA team noted that production has developed an innovative, tailored pre-job briefing template to guide efficient performance of pre-job briefings. The personnel performing the work were well qualified, had significant experience, and a high level of knowledge. Most production activities were performed in accordance with procedures and existing controls. Operations were performed using approved procedures, and administrative requirements and postings were rigidly followed. A number of mechanisms were used for collecting activity-level feedback, including specific requirements for post-job reviews and post-job briefings. Meetings are also held periodically to discuss recent events, concerns, and to share lessons learned information with staff. AL-WP&C assessments were conducted, and specific performance-based deficiencies were managed through the issues management process.

However, weaknesses were identified with regard to hazards analysis and controls for some skill-of-the-craft work, the usability of some PM work instructions, a lack of post-maintenance testing for some dispatched maintenance work, and managing changes to construction work scopes. Most significantly, instances of lapses in disciplined operations were observed with regard to not suspending work for an unexpected condition, procedural use and compliance, postings, and some radiological practices. Recent NPO correspondence also identified concerns with disciplined operations, and the Y-12 Safety Culture Dashboard work processes principle was rated as yellow based on the number and significance of procedure adherence related issues.

NPO oversight quick checks were assessing work activities, and related NPO-identified key issues were in alignment with the results of this review. NPO was appropriately working on several areas of improvement for its oversight processes (i.e., trending and corrective actions).

7.0 FINDINGS

None. Because NPO identified disciplined operations as a key initiative in recent correspondence to CNS, EA did not cite a finding in this area.

8.0 OPPORTUNITIES FOR IMPROVEMENT

These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are suggestions offered by the EA team that may assist site management in implementing best practices, or provide potential solutions to minor issues identified during the conduct of the assessment. In some cases, OFIs address areas where program or process improvements can be achieved through minimal effort. It is anticipated that these OFIs will be evaluated by the responsible line management organizations and either accepted, rejected, or modified as appropriate, in accordance with site-specific program objectives and priorities.

Y-12

Y12-OFI-1: Integrate efforts to improve safety culture and conduct of operations.

- Evaluate lapses in disciplined operations to better understand the underlying organizational behaviors.
- Use the results of such evaluations as learning opportunities, to adjust organizational processes, and/or to reinforce expectations.

Y12-OFI-P-1: Ensure that operations procedures properly reference associated ancillary activities and related activities and tasks that will be conducted via skill of the craft, so that appropriate hazard analysis can be accomplished and controls implemented. Evaluate the need to revise Y15-232, Technical Procedure Process.

Y12-OFI-P-2: Modify existing WP&C processes to ensure systematic mechanisms exist and are consistently followed such that hazards associated with all skill-of-the-craft work are appropriately identified, analyzed, and controlled. Specific actions to consider include:

- Revise the production work planning process to address the definition of skill-of-the-craft work, boundaries, and work planning requirements that ensure hazards associated with skill-of-the-craft work have been formally analyzed at least one time, and necessary controls are verified to be within the skill set and training prior to work.
- Consider the information provided in NNSA's 2006 Work Planning and Control guidance, which specifically addresses recommendations regarding skill-of-the-craft boundaries and expectations.
- In conjunction with JHAs, consider development of facility-level safety plans for each production facility that address safety and health requirements and expectations associated with frequently performed routine activities, and define the necessary controls for these operations (e.g., safety shoes, two-man lifts, leather work gloves, safety glasses) so that repetitive hazards and controls need not be repeated elsewhere. Ensure that personnel expected to adhere to such documentation are appropriately trained and qualified on its content and use.

Y12-OFI-P-3: Review and refine the definitions of medium- and low-risk work contained in Y15-232 to reduce or eliminate subjectivity associated with the need for a procedure. Provide appropriate reference

to WP&C requirements when a decision is made that a technical procedure is not needed for a given work scope.

Y12-OFI-P-4: Consider development of a procedure governing proper use of the AJHA software, including requirements to ensure all listed implementation strategies are clearly linked to specific evidence (e.g., procedure number, training course, specific qualification).

Y12-OFI-P-5: Improve worker and supervision compliance with conduct of operations requirements for procedure use, adherence and suspension, and radiological control practices. Specific actions to consider include:

- Conduct additional targeted conduct of operations assessments to evaluate extent of condition and areas for corrective action.
- Schedule informal meetings between work groups, supervision, and management to discuss concerns and expectations in this area, and gain insights toward resolution.
- Reinforce expectations for conduct of operations through additional training, safety briefings, and behavior-based safety feedback.
- Consider instituting an incentive program that rewards workers who identify procedure adherence and verbatim compliance concerns, or who appropriately suspend procedure use when steps cannot or will not be performed as written.

Y12-OFI-M-1: Review all Y-12 machine shop JHAs, and ensure that all work activities performed in the shops and associated hazards and controls are identified in shop JHAs.

Y12-OFI-M-2: Revise the maintenance dispatched work process to ensure that when PPE is used by workers that a hazard analysis process is performed and documented in accordance with Y73-116 Personal Protective Equipment Program and Occupational Safety and Health Administration PPE requirements in 29 CFR 1910.132.

Y12-OFI-M-3: Develop a hazard and control, and operator qualification program for workers who use the shop equipment in Y-12 maintenance machine shops.

Y12-OFI-M-4: Provide sufficient resources for IH to implement the OEA process on all work activities based on risk, and to perform OEA reassessments in a timely manner in accordance with guidance established in Y73-66-IH-011GUD.

Y12-OFI-M-5: Ensure that equipment calibration programs for the LEV snorkel hoods used for welding hoods ensure equipment operability, and that calibration programs are established for infrared thermometers and other equipment used routinely in maintenance PMs to ensure equipment operability.

Y12-OFI-M-6: Use management interventions to reinforce the importance of following work instructions, postings and signage in maintenance shops, facilities, and work areas, and that such area postings are consistent with the requirements for signage and postings provided in JHAs and work instructions.

Y12-OFI-M-7: Ensure that post-work testing requirements are developed for dispatched work involving corrective intrusive maintenance as required by Y18-012. Perform an assessment of corrective maintenance performed during the past year as dispatched work to assess the extent of condition of corrective maintenance performed as dispatched work that involved intrusive maintenance activities but

failed to include any documented PWT requirements prepared in accordance with the requirements of IWCM Y18-012.

Y12-OFI-C-1: Evaluate and revise the HA/WI process as necessary to ensure that expectations for timely evaluation and updates for changes to work scope are clearly articulated.

Y12-OFI-C-2: Evaluate the need for enhancing methods to identify the specific hazards and controls that are likely to be encountered on a daily basis, including a walkdown of the jobsite before work starts.

Y12-OFI-C-3: Consider trending the feedback that is collected on daily briefing forms to identify additional learning opportunities.

NPO

NPO-OFI-1: Ensure plans or other information provided to external stakeholders is evaluated to identify commitments (or other obligations to stakeholders), and that actions needed to meet those commitments are appropriately assigned and tracked to completion.

9.0 ITEMS FOR FOLLOW-UP

EA will follow up on the actions and schedules developed by CNS to further evaluate concerns regarding disciplined operations and on NPO's continued focus on this area through their line oversight mechanisms.

Appendix A
Supplemental Information

Dates of Review

Onsite Review: September – October, 2014

Office of Enterprise Assessments

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
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William Eckroade
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Jimmy Dyke

Office of Enterprise Assessments Reviewers

Thomas Staker, Team Leader
James Coaxum
James Lockridge
Terry Olberding
Mario Vigliani

Appendix B
Key Documents Reviewed, Interviews, and Observations

Documents Reviewed

Assessment Number: IA-13-009 IS Excavation-Penetration Work
Assessment Number: IA-14-008 Maintenance Work Control
ATLC Safety and Health Tracking Log
B&W Y-12 Procedure Y15-636 Integrated Safety Management
B&W Y-12 Procedure Y15-902 Management Assessment
B&W Y-12 Procedure Y15-903 Independent Assessment Program
B&W Y-12 Procedure Y15-904 Qualification of Independent Assessment Personnel
B&W Y-12 Procedure Y15-909 Surveillance
B&W Y-12 Y15-635PD Y-12 Integrated Safety Management
B&W Y-12 Y15-707 System Feedback and Improvement Process
B&W Y-12 Y15-906PD Contractor Assurance System
DOE G 226.1-2A, *Federal Line Management Oversight of DOE Nuclear Facilities*, 4/14/2014
Facility Evaluation (FE) FE-14-003 9720-5 & Non-MAA Warehouses
Facility Evaluation (FE) Number: IA-13-005 FE 9204-24 Complex (PF)
Facility Evaluation Number FE-14-001-14-001 9720-82 HEUMF (PF)
Facility Evaluation Number: IA-13-001 Facility Evaluation of General Manufacturing (9201-1)
FE-14-002 9212- Facility Evaluation
FR 9995-HVAC-0001, Functional and Operational Requirements for 9995 HVAC Replacement Project, 1/2013
GHS Hazard Communication Training for Supervisors; Rev. 5/6/2013
HA/WI Wl-2013-00054, 9995 HVAC Replacement, R3, 9/3/2014
HA/WI WI-2014-00014, 9204-2E Kathabar Demolition, R0, 8/26/14
HA/WI WI-2014-00011, 9744 Building Demolition, R3, 9/9/14
HA/WI WI-2013-00033, 9212 Condensate Line Upgrades, R1, 3/25/14
HA/WI WI-2014-00005, West End Warehouse Upgrades, R1, 8/14/14
HA/WI WI-2014-00004, 9202 Atomization Equipment Installation, R0, 4/28/14
HA/WI Request, Kathabar pipe demolition, 8/13/14
HA/WI Request, Building 9995 HVAC Replacement, 12/19/13
Independent Surveillance Number: IS-14-017 Corrective Actions
Issue Number 30124755
Issue Number 30701322
Issue Number 31031726
Issue Number 31038052
Issue Number 31129444
Issue Number 31150762
Issue Number 31178359
Issue Number 31178805
Issue Number 31193685
Issue Number IA-13-009
JHA 0012463 9212 Stack 110
JHA 0012519 Mop Water System and Floor Scrubber Operations
JHA 0012822 Machining Operations
JHA 0013028 Operation of MCS-R-500-A, M-Wing Cleaning Sink
JHA 0013178 Operation of Small Vacuum Induction Casting Furnaces
JHA 0013295 Containers and Material Handling
JHA 0013517 9204-2E Baseline Cleaners, Combustible and Non-combustible Waste

JHA 0013742 9204-2 and 9204-2E General Material Handling and Inventory Requirements
JHA 0700498 Operation of Dismantlement Lathes
JHA 0700510 Phase 1 of Dismantlement
MA-ESH-IS-14-04 Effective Use of the Analytical Chemistry Hazard Identification Worksheet
MA-ESH-ISM-13-04-001 Management Assessment of ISM Focus Area of Work Control/Hazard Identification
MA-ESH-SAF-14-01 Management Assessment of Safety Series AJHA/HIW Verification
MA-ESH-TS-FY13-002 Alternate Construction Hazard Analysis and Work Control Process
MA-ESH-TS-FY13-003 Approved JHAs and Operating Procedures
Management Assessment Report MA-ESH-IS-14-02 ES&H Employee Concerns
MA-PA-14-001 CAS Follow-up on Closed Issues: Adequacy of processing issues IAW requirements of Y15-312, Issues Management Process
MA-PA-14-002 CAS Effectiveness Review: Performance Measures (Validity of Data Presented)
NASH Biennial Review Exit Slides, 2/27/2014
NASH Biennial Review of NPO Final Report, 2/2014
NA-YSO-BWXT-Y12SITE-2012-0008 Recurring Event Identified in FI&S Work Control
NA-YSO-BWXT-Y12SITE-2014-0003 SURGERY Required for Leg fractures Due to fall
NA-YSO-BWXT-Y12SITE-2014-0004 LO\TO Procedure Violation
NA-YSO-BWXT-Y12SITE-2014-002 Omission of Personal Locks on LO/TO
NNSA Letter, *Response to DNFSB Letter and Technical Report-37*, 11/30/2012
NNSA Letter, *Response to DNFSB on DOE Assessment of the Effectiveness of Actions Taken to Improve AL-WP&C*, 2/14/2014
NNSA Memorandum, *Action: Revitalizing ISM; Site Office Action Plans for Improving AL-WP&C, 1/23/2006*
NNSA Memorandum, *Strengthening Implementation of WP&C at the Activity level*, 11/12/2013
NNSA Memorandum, *Strengthening Implementation of WP&C at the Activity Level*, 11/19/2013
NNSA Memorandum, *Sustained Federal and Contractor Oversight of Al-WP&C*, 1/25/2013
NPO (Y-12) Field Office Report, 10/3/2014
NPO Assessment Report, FY-14-OM-OPS-04, *Independent Verification*, 6/2014
NPO Fourth Quarter FY 2013 Assessment Report; Maintenance Program Management Planning, Scheduling, and Coordination of Maintenance; Rev. 0, September 2013
NPO FY14 Maintenance Quick Checks
NPO FY14 Operations Quick Checks
NPO FY14 Site Integrated Assessment Plan, 6/30/2014
NPO IWOC Agenda, 9/2014
NPO Letter, *Concerns With Y-12 Operational Discipline*, 8/11/2014
NPO Letter, *Issue – Extent of Condition Review*, 9/27/12
NPO Memorandum, *NPO Y-12 and Pantex AL-WP&C Analysis*, 2/2014
NPO Organizational Chart, Rev 8, 1/23/14
NPO QIMM Agenda, 9/17/2014
NPO Self-Assessment, *Conduct of Operations Safety Management Program*, Rev. 0, 12/2013
NPO Self-Assessment, *Maintenance Program Management*, Rev. 0, 11/2013
NPO Shadow Assessment, *Special Nuclear Material Vehicle System Health Validation*, 7/2013
NPO Shadow Assessment, *Weekly PM 221/308 Substation Battery Bank and Charger*, 2/2013
NPO-1.5, *NPO Operating Philosophies and management System Description*, Rev. 0, 10/31/13
NPO-2.2.2.1, *Functions, Responsibilities, and Authorities Manual*, Rev. 0, 7/15/2013
NPO-2.2.2.6, *Differing Professional Opinion Process*, Rev. 0, 1/18/2013
NPO-3.1.2, *NPO Oversight Planning Process*, Rev. 0, 10/9/2012
NPO-3.4.1.1, *NPO Oversight Process*, Rev. 0, 9/26/12
NPO-30 Y-12 Contractor Transition Oversight Report, 6/19/2014

ORPS-FY14-3Q/RO Occurrence Reporting Analysis and Trending for the Reporting Period July 1, 2013 – June 30, 2014
PD-SURV-2014-003 Work Control Documents Compliance with Integrated Work Control Requirements
PD-SURV-C-2013-029 Construction JHA Analysis
PLN 9744-F-0002, Rev 0, Building 9744 Demolition Plan, 9/4/2014
PLN 9995- HVAC-0001, R1, Building 9995AHU 1000 Replacement Project Execution Plan, 6/2014
PL-PJ-900000-A093, R6, Project Execution Plan for the Nuclear Facility Risk Reduction Project, 4/2014
POD Agenda for Development Organization, 9/17/14
Projects Field Work Authorization Checklist, 9215 O-Wing Cleanup
Projects Field Work Authorization Checklist, Nuclear Facility Risk Reduction Stack 110/43 Phase II Outages, CK N9212-S43-0001
RWP 2006-C1-305-7-F
RWP 2006-C1-400-f-Y
RWP 2007-E1-756-9-Y
RWP 2008-E1-814-8-Y
RWP 2014-C1-301-0-F
RWP 2014-E1-413-0-Y
RWP 2008-E1-820-7-F
RWP 2009-B2-003-2-Y
RWP 2009-E1-903-7-Y
RWP 2009-E-1-913-2-Y
RWP 2010-E1-016-1-F
Surveillance Number: IS-IAO-13-021 Follow-up, Corrective Actions for IA Issues/Information
SURV-ESH-14-IS-006 Quarterly/Surveillance for ES&H Lockout/Tagout Field Activities
SURV-ESH-14-IS-015 Quarterly/Surveillance for ES&H Lockout/Tagout Field Activities
SURV-ESH-14-IS-017 Quarterly/Surveillance for ES&H Lockout/Tagout Field Activities
TWA-CKBR, Demolish Kathabar 3340, R0, Task Work Authorization, 08/14/2014
TWA-170, 9202 Atomization Project, 4/9/2014
TWA-189, 9720-26 Prep Work, 6/24/14
Task Review Board Checklist for TWA 170 9202 Atomizer, 4/17/14
UCN 20584; Proactive Maintenance (PM) Change Control & Instructions; Rev July, 2014
Y/IA-422; List of Pre-Approved Dispatched Work; July 31, 2014
Y/IA-465, Rev. 2 Conduct Of Maintenance Monitoring And Improvement Action Plan
Y/NSOO-0007 Independent Review of Y-12 Conduct of Operations and WP&C Performance Improvement Plans (PIPs)
Y-12 CAS Performance Report, 2nd Quarter, FY13, 10/2013
Y-12 CAS Performance Report, 3rd Quarter FY13, 7/2013
Y-12 CAS Performance Report, 3rd Quarter FY14, 8/2014
Y-12 CAS Performance Report, 4th Quarter FY12, 10/2012
Y-12 Procedure Y14-192 Occurrence Notification and Reporting
Y-12 Procedure Y15-331 Lessons Learned Program
Y15-187; Integrated Safety and Change Control Process; Rev. 11/14/2013
Y15-232 Technical Procedure Process
Y15-235 Conduct and Documentation of Critique Process
Y15-636; Integrated Safety Management Program; Rev. 05/28/2014
Y15-636PD; Integrated Safety Management Program
Y17-64-GM-0501, Safety Handbook Direct-Hire Construction, 6/2013
Y18-012; Integrated Work Control Manual (IWCM); Rev. 08/11/2014
Y-18-018PD; Nuclear Maintenance Management Program (NMMP); Rev. 11/27/13
Y23-203; Occupational Noise Exposure and Hearing Conservation Program; Rev. 04/21/2010
Y50-01-B2-120 Handling Enriched uranium Low-Level Contaminated Waste

Y50-01-B2-149 Floor Maintenance Operations
Y50-01-B2-161 Haas Lathe Operation
Y50-01-B2-181 Preliminary Dismantlement
Y50-03-10-006 Machining Operations
Y50-24-18-168 Operation of B-11S Casting Furnace
Y58-01-B2-150 Cleaning Activities in First Floor Electro-Polishing Area
Y58-03-10-006 Operation of MCS-R-500-A, M-Wing Cleaning Sink
Y58-08-MOPS-001 Chip Packing
Y58-24-18-030 Startup of FVS-JV-201 Roughing Vacuum Pump
Y58-24-18-033 Shutdown of FVS-JV-201 Roughing Vacuum Pump
Y58-24-18-034 Loading of Small Casting Furnace
Y58-24-18-036 Startup of FVS-JV-111 Finishing Vacuum Pump
Y58-24-18-037 Shutdown of FVS-JV-111 Finishing Vacuum Pump
Y70-37-103 Containers and Material Handling
Y71-930 Environmental Aspect/Impact Identification and Significance Determination
Y72-001 Environment, Safety and Health Policy
Y73-001 B&W Y-12 Safety Program
Y73-004 PDB&W Y-12 10 CFR Part 851 Worker Safety and Health Program
Y73-004PD; B&W Y-12 10 CFR 851 Worker Safety and Health Program; Rev. 05/13/2014
Y73-045 Job Hazard Analysis
Y73-045; Job Hazard Analysis
Y73-045; Job Hazard Analysis; Rev. 07/30/2013
Y73-050; Respiratory Protection Manual; Rev. 07/10/12
Y73-116 Personnel Protective Equipment Program
Y73-116; Personal Protective Equipment Program; Rev. 03/31/2011
Y73-181PD; Hazardous Materials Management Program Description
Y73-200 PD Industrial Hygiene Program
Y73-201 Chronic Beryllium Disease Prevention Program Manual
Y73-202; Exhaust Ventilation for Personnel Protection; Rev. 10/26/2010
Y73-208PD; Hazard Communication Program; Rev. 7/07/2008
Y73-66-IH-011GUD; Occupational Exposure Assessment Guidance; Rev. 03/05/2014
Y75-100 Y-12 Site Radiological Control Program
Y75-122 Radiological Work Permit
Y75-122 Selection and Use of Protective Clothing for Radiological Protection
Y90-027 Conduct of Training Manual
Y17-64-301, Construction Work Planning
Y17-64-302, Execution of Direct-Hire Work
Y17-64-319, Inspection Package
Y17-64-321, Construction Hazard Assessments and Work Instructions
Y17-64-401, Construction Subcontract Management
Y17-64-322, Safety Task Analysis and Risk Reduction Talk (STARRT) Process
Y17-64-307, Execution of Special Construction Work, 8/1/11
Y13-87-004, *Project Execution Plans*

Interviews

Fabrication Operations managers, supervisors, and workers
Assembly/Disassembly Operations managers, supervisors, and workers
Y-12 Radiological Control Field Operations manager, supervisors, and radiological control technicians
Maintenance Planners
Maintenance Supervisors

Maintenance Workers
Maintenance Safety Representatives
Y-12 Industrial Safety & Hygiene Manager
Y-12 deployed Industrial Hygienists and IH Technicians
Manager, Maintenance Management & Integration
Manager, Facilities Services
Manager, Infrastructure Organization
Manager, Infrastructure & Projects Management
Manager, Maintenance Program Engineering
Manager, Predictive Maintenance Program
Manager, Y-12 Training and Coordination
Training Manager; Infrastructure
Lead Trainer; HAZCOM, IH, Lead and Hearing Conservation Manager of Construction
Construction Operations Manager
General Superintendent
Subcontracts Manager
Construction Superintendent
Construction Safety Lead
Training Officer for Projects Management
Construction Manager (2)
Field Engineering Manager
Industrial Hygienist for Construction
Radiological Protection Area Monitoring Supervisor for Construction
Safety Lead for Construction
Industrial Safety
Mechanical Field Engineer
NPO Assistant Manager for Operations Management
NPO Assistant Manager for Environmental Safety and Health
NPO Deputy Assistant Manager for Operations Management
NPO Performance Assurance Manager
NPO Nuclear Safety SME
NPO Maintenance SME
NPO Criticality Safety SME
NPO Group 1 FR
NPO Group 2 FR
NPO Group 3 FR

Observations

1 Month PM 200kw Generator; HEUMF; WO50520414
9404-10 Paint Tower Lines and Support; WO 50522928
9404-4 Paint Plywood; WO50515544
Check/Repair Duress switch on CAS Console; WO50525387
Install Heat Trace Circuit; WO50487077
Integrated weekly operations call
JCC Test & Checkout Lenel Reader; WO50523874
Maintenance Shop 9201-3
Maintenance Shop 9404-5 (Paint Shop)
Maintenance Shop 9423
Maintenance Shop 9720-20
Maintenance Shop 9725

Perform 6 Month PM on EUO Exhaust Fan EF-3; WO50516443
Perform the Annual PM of EF-604; WO50518958
PM Lung Counter Sliding Door 6 Month PM; WO50438526
Quarterly issues management meeting
Repair Checkpoint 13 Barrier; WO505279963
Walk down depleted uranium operations
Walk down; Strip out unneeded conduit hanging from ceiling; WO50440243
Y-12 Contractor AL-WP&C briefings
Assembly/Disassembly operations
Casting Operations
Machining Operations
Material Movement
Machine cleaning
9720-26 facility upgrades construction job
Development atomizer project construction job
Kathabar removal project construction job
9212 Process condensate construction job
9744 demolition construction job
Stack 110 construction job
9995 HVAC construction job
JCI Relamping project
HA/WI walkdown
Project Review Board meeting
Construction management weekly project safety walkdown
Kickoff meeting for the 9744 demolition project