Office of Enterprise Assessments
Targeted Review of
Work Planning and Control at the
Nevada National Security Site

October 2015

Office of Worker Safety and Health Assessments
Office of Environment, Safety and Health Assessments
Office of Enterprise Assessments
U.S. Department of Energy

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Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
AHIC	Activity Hazard Inventory Checklist
AIP	Assessment Implementation Plan
ALARA	As Low As Reasonably Achievable
AL-WP&C	Activity-Level Work Planning and Control
ALWD	Activity-Level Work Document
AMSO	Assistant Manager for Site Operations
CA	Contamination Area
CAS	Contractor Assurance System
CBDPP	Chronic Beryllium Disease Prevention Program
CCD	NSTec Core Company Directive
CD	NSTec Company Directive
CRAD	Criteria Review and Approach Document
CT	Computed Tomography
DAF	Device Assembly Facility
DOD	Department of Defense
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
EC	Executive Council
ES&H	Environment, Safety, and Health
ESS	Electronic Security Systems
FBI	Federal Bureau of Investigation
FR	Facility Representative
FY	Fiscal Year
IH	Industrial Hygiene
IMIP	Integrated Management Improvement Plan
INL	Idaho National Laboratory
IST	Issues Screening Team
IWD	Integrated Work Document
IWS	Integration Work Sheet
JAS	Joint Assessment Schedule
JASPER	Joint Actinide Shock Physics Experimental Research
JHA	Job Hazard Analysis
JLG	Articulating Boom Lift
JLON	Joint Laboratory Office-Nevada
LANL	Los Alamos National Laboratory
LL	Lesson Learned
LLNL	Lawrence Livermore National Laboratory
LO/TO	Lockout/Tagout
LSPT	Limited-Scope Performance Test
MA	Management Assessment
M&O	Management and Operating
NCERC	National Criticality Experiments Research Center
NFO	Nevada Field Office
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NPTEC	Nonproliferation Test and Evaluation Complex
NSTec	National Security Technologies, LLC
NvE	Nevada Enterprise

OAA	Operational Awareness Activity
OFI	Opportunity for Improvement
ORPS	Occurrence Reporting and Processing System
PM	Preventive Maintenance
POD	Plan of the Day
PPE	Personal Protective Equipment
PRCIEST	Passenger Railcar Chemical and Improvised Explosives Seminar and Test
PTHR	Pre-Task and Post-Task Hazard Review
RBA	Radiological Buffer Area
RCT	Radiological Control Technician
REOP	Real Estate Operations Permit
RM	Responsible Manager
RSL	Remote Sensing Laboratory
RTO	Radiation Test Object
RWMC	Radiological Waste Management Complex
RWP	Radiological Work Permit
SIPR	Secret Internet Protocol Router
SME	Subject Matter Expert
SOP	Standard Operating Procedure
SOTW	Skill of the Worker
SPE	Special Physics Experiment
SPO	Security Police Officer
SPP	Strategic Partnership Project (formerly known as work for others)
SSO	Safety System Oversight
TACS	Training Assembly for Criticality Safety
THWP	Toxic Hazard Work Permit
USQD	Unreviewed Safety Question Determination
WFO	Work for Others
WP&C	Work Planning and Control

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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 (AL-WP&C) at the Nevada National Security Site (NNSS). NNSS's primary missions are to support National Nuclear Security Administration (NNSA) defense programs involving the nuclear stockpile, nuclear nonproliferation programs, and nuclear emergency response capabilities. NNSS is managed and operated by National Security Technologies, LLC (NSTec), with oversight by the NNSA Nevada Field Office (NFO).

EA's review of NNSS AL-WP&C focused on operations, maintenance, construction, and protective force activities, as well as the associated NNSS assurance and NFO oversight processes. This review of NNSS was part of a broader EA targeted review of AL-WP&C and control across DOE that partially addresses a DOE commitment to the Defense Nuclear Facilities Safety Board to enhance Federal oversight in this area.

Although NSTec is the management and operating contractor, other organizations perform activity-level work on site, including members of the Nevada Enterprise (NvE), a forum that provides the planning and integration needed to support accomplishment of joint Federal, contractor, and laboratory goals for activities under the purview of the NNSA/NFO. Nevada Enterprise members evaluated during this EA review include NNSA/NFO, NSTec, Centerra-Nevada, and the Joint Laboratory Office-Nevada, which represents the Lawrence Livermore National Laboratory and Los Alamos National Laboratory presence at NNSS. NFO requires the use of a Real Estate Operations Permit process to ensure that work performed by NSTec and others is clearly defined and authorized, and that the responsibility for safety coordination is assigned to a single entity. EA reviewed work planning and control processes at NSTec, including Strategic Partnership Projects (i.e., work for others); the Joint Laboratory Office-Nevada; and Centerra-Nevada.

EA found that NSTec has established an effective process to govern work control. NSTec personnel are experienced and knowledgeable of assigned work activities, and they interacted with each other in a professional manner. Hazards identification, analysis, and control selection are effectively integrated into the development of activity-level work documents. Work authorization and feedback mechanisms are in place and effective. For the most part, workers performed the observed work in accordance with site processes and procedures. However, EA identified some issues in pre-job briefings, unidentified hazards, insufficiently defined hazard controls, and performance of work within controls. One sitewide NSTec concern was the lack of work planning and control "triggers" to characterize potential beryllium legacy areas in unoccupied facilities before potential dust-disturbing work is performed in those areas.

The Joint Laboratory Office-Nevada has established appropriate work planning and control processes to ensure that NNSA/NFO-specific requirements are met for national laboratory activities at the NNSS. While these processes are generally sufficient, EA observed a few weaknesses in radiological controls and work scope definition.

The NSTec and Joint Laboratory Office-Nevada assurance systems are identifying and correcting deficiencies, but EA noted some concerns in issue significance categorization and performance indicators.

The Centerra-Nevada work planning and control processes are generally adequate to ensure that work is conducted effectively and in accordance with established controls. Work scopes are sufficiently defined, hazards are adequately analyzed, and controls are appropriately selected. Workers are trained and qualified, and work is conducted in a planned, coordinated, and controlled manner. However, EA identified some weaknesses with respect to following work control procedures, industrial hygiene exposure assessments, and hazard identification in Real Estate Operations Permits.

There was limited field work in the two selected Strategic Partnership Projects, so EA's observations were limited to project scoping and planning activities or preparatory work activities. EA identified some issues in the plan-of-the-day meeting and the pre-job briefing. EA noted improvements since the 2007 oversight review of work-for-others projects (now known as Strategic Partnership Projects), particularly in the integration and communication among the various participating organizations.

NFO has implemented oversight processes for AL-WP&C that for the most part are effectively implemented, with experienced and well-qualified staff. NFO has assigned a subject matter expert for the functional area of work planning, but operational awareness assessments have been limited, and NFO has not conducted any formal WP&C functional area assessments since 2007. NFO's suite of procedures adequately defines its assessment and issues management processes, although EA noted concerns in the reliance on the contractors' issues categorization process and the need for compensatory measures to ensure full Facility Representative coverage during a current staffing shortage.

Overall, NNSS contractors evaluated during this review have established adequate work control systems that govern a complex set of interrelated work activities for most of the observed work. However, EA identified several areas where improvement in work planning and control processes is warranted. During this review, NNSS contractors were in the process of implementing organizational changes and other improvements in work planning and control, some as a result of corrective actions from recent reportable events such as the 55-gallon drum explosion in June 2014. Continued management vigilance is needed in implementing effective and sustainable improvement. EA will follow up in future reviews to determine whether these changes are effective in driving improvement.

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1.0 PURPOSE

The U.S. Department of Energy (DOE) independent Office of Enterprise Assessments (EA) conducted a targeted review of the activity-level work planning and control (AL-WP&C) processes and activities at the Nevada National Security Site (NNSS). National Security Technologies, LLC (NSTec) is the primary management and operating (M&O) contractor at the NNSS. The National Nuclear Security Administration (NNSA) Nevada Field Office (NFO) provides Federal oversight of NSTec. The onsite portions of the EA targeted review were conducted March 23-26 and April 13-16, 2015.

This targeted review is part of a larger-scale targeted assessment of AL-WP&C across the DOE complex. 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 letter and technical report (DNFSB/Tech-37).

2.0 SCOPE

EA conducted this targeted review of the AL-WP&C program at NNSS in accordance with an EA assessment plan, *Plan for the Office of Enterprise Assessments Targeted Review of Work Planning and Control*. To assess the performance of AL-WP&C at NNSS, EA reviewed the documented processes, including work planning and control (WP&C) procedures, hazard analyses and controls, technical procedures, maintenance work packages, construction work packages, and other WP&C documents; interviewed key NFO, NSTec, and Joint Laboratory Office-Nevada (JLON) personnel; observed meetings; and conducted other data-gathering activities. EA focused on observing activity-level work in the areas of operations, maintenance, and construction, including work authorization activities, pre-job or pre-evolution briefings, execution of work activities, post-job feedback, and contractor assurance system (CAS) activities. This review also included evaluation of NFO processes for oversight of contractors' AL-WP&C activities.

3.0 BACKGROUND

The EA independent assessment 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 227.1, *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. EA selects, prioritizes, and plans assessment activities based on such factors as risk to workers and the public, facility operational status, and performance history.

The NNSS, located approximately 70 miles north of Las Vegas, Nevada, is an extensive outdoor laboratory and national experimental center. NSTec is responsible for performing an array of activities at the NNSS, including stockpile stewardship, hazardous chemical spill testing, emergency response training, waste management, environmental technology studies, and support for the Department of Homeland Security and other Federal agencies. Covering approximately 1,375 square miles, the NNSS is one of the largest restricted-access areas in the United States. The remote site is surrounded by thousands of additional acres of land withdrawn from the public domain for use as a protected wildlife range and for the Nellis Air Force Base military gunnery range, creating an unpopulated land area comprising some 5,470 square miles.

Many organizations perform activity-level work on site, including members of the Nevada Enterprise (NvE), a forum that provides planning and integration to support joint Federal, contractor, and laboratory goals for activities under the purview of the NNSA/NFO. NvE is comprised of all the major organizations on site. NvE members evaluated during this EA review include NNSA/NFO, NSTec, Centerra-Nevada, and the JLON, which represents the Lawrence Livermore National Laboratory (LLNL) and Los Alamos National Laboratory (LANL) presence at NNSS. Although several of these organizations are prime contractors to DOE, NSTec is the M&O contractor for NNSS and is responsible for performing much of the onsite activity-level work, including coordination of work with the other organizations.

EA reviewed activities at several NNSS facilities/areas, including the Device Assembly Facility (DAF), the Radioactive Waste Management Complex (RWMC), the U1a Complex, and the Nonproliferation Test and Evaluation Complex (NPTEC). DAF was originally built to consolidate nuclear explosives assembly operations. Its current mission includes support for subcritical experiments, and it also houses the Criticality Experiments Facility, formerly located at LANL. The Area 5 RWMC disposal cells serve as the western region national disposal sites for low-level waste and mixed low-level waste generated at DOE and Department of Defense (DOD) facilities. The U1a Complex provides an underground experiment test bed for conducting confirmatory experiments, subcritical experiments, and calibration experiments. NPTEC is the world's largest facility for open air testing of hazardous toxic materials and biological simulants. The facility provides independent field-testing and evaluation of emerging sensor technologies and can perform tests, experiments, or training for any technology that requires the release of toxic chemicals or biological simulants into the environment. At NPTEC, on June 13, 2014, a 55-gallon drum that workers believed to be empty exploded and resulted in serious but non-life-threatening injuries to two personnel. After the accident and the resulting investigation, NPTEC embarked on a general site cleanup with the intention of identifying and removing excess property, material, and chemicals. At the time of the EA review, the ongoing cleanup process was 75% complete, and the EA team observed some of the cleanup work activities.

4.0 METHODOLOGY

EA's *Plan for the Office of Enterprise Assessments Targeted Review of Work Planning and Control at the Nevada National Security Site* identified the criteria, review and approach documents (CRADs) 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 review. Appendix B provides a detailed list of the documents reviewed, personnel interviewed, and observations made during this review, relevant to the findings and conclusions of this report.

5.0 RESULTS

5.1 Real Estate Operations Permit Process

The Real Estate Operations Permit (REOP) process, which is unique to NFO/NNSS, is a critical component of the WP&C process. NFO uses the REOP process to ensure that work is clearly defined and authorized, and that the safety coordination responsibility is assigned to one entity. The process defines a facility user model (similar to a landlord-tenant model), with a primary REOP for the facility management (usually assigned to NSTec) and one or more secondary REOPs for programmatic work performed by other organizations. The NFO manager approves all primary and secondary REOPs for hazard category 2 and 3 nuclear facilities, as well as other designated facilities of interest to NFO. Although the REOP process allows other organizations (such as Centerra-Nevada) to conduct and manage work under a primary REOP when they are solely responsible for the facility, safety basis, and activity-level work performance, the national laboratories almost always perform their work under a secondary REOP, within a facility managed by NSTec as the primary REOP holder. In general, the REOP process is adequately described in the NSTec and JLON procedures.

5.2 National Security Technologies Work Control

The NSTec work processes, in combination with NvE enterprise members' respective organization work control processes, generally provide a sufficient framework to ensure that work performed on site is appropriately planned, integrated, and controlled.

NSTec Core Company Directive (CCD), CCD-QA05.001, *Integrated Work Control Process*, provides an overview of the WP&C processes, and addresses the REOP process. In general, this directive adequately describes the integrated work control process, but its last revision removed the completion date (October 1, 2013) for transitioning to the planner credentialing program. As described in the directive, the planner credentialing program is a formal training program that provides for a graded approach to specifying planner qualifications, covering the levels of work planner positions, i.e. lead planner, senior planner, and principal planner. However, work planners continue to be qualified under the old program, and there is no incentive to transition to the new program. EA identified two work planners who would have been required to complete additional training under the planner credentialing program. (See **OFI-NSTec-1**.)

The NSTec CCD on the integrated work control process is supplemented by additional directives that provide more detailed instructions on various aspects of WP&C. CCD-QA05.001-005, *Work Package Process*, allows a graded approach to the development of work packages. A Type I work package is "in-hand use" for high complexity, infrequently performed work, with moderate to high consequences. These packages contain step-by-step instructions, require a formal pre-job briefing and post-job debriefing, and require a job hazard analysis (JHA). Type II work packages are "general use" and require general direction, pre-job briefings and post-job debriefings, and a JHA. Type III work packages are for "reference use," contain a statement of work, require pre-job briefings and post-job debriefings, and do not require a JHA. Type IV work packages are used for minor work evolutions that involve the lowest risk. They contain a statement of work and require an informal pre-job briefing. The technical procedure process, as well as CCD-QA05.001-006, allow for a graded approach for procedure development and defines the use categories (I, II, and III).

CCD-QA05.001-003, *Activity Level Hazards Analysis Process*, is used to identify and analyze hazards and identify controls for activity level work. Overall the process is adequate, but the directive contains numerous pen and ink changes, which are sometimes difficult to follow. In addition, there are inconsistences as to whether a walkdown of the worksite or a tabletop discussion of the activity is required for the hazards analysis process. The introductory paragraph of Appendix C, Completing FRM-0017, states that a walkdown is required during the planning team job aid process; however, Appendix B of that same procedure refers to a walkdown/tabletop. CCD-QA05.001, *Integrated Work Control Process*, Section 4.10 also requires a walkdown, followed by a tabletop. Work packages show that walkdowns are not always conducted as part of the NSTec hazards analysis process. (See **OFI-NSTec-1**.)

Generally, the scope of NSTec work is sufficiently defined, hazards are analyzed, controls are appropriately selected, workers are well qualified, and work is conducted in a planned, coordinated, and controlled manner. Managers, supervisors, operations, craft, and environment, safety, and health (ES&H) personnel are experienced and knowledgeable of their assigned work activities, and they interacted with each other in a professional manner. For the most part, the plan of the day (POD) meetings and pre-job briefings were thorough, interactive, and tailored to the activities.

However, in a few areas involving Type II and III work packages, pre-job briefings did not meet the requirements of CCD-QA05.001-009, *Pre-Job Briefings and Post-Job Debriefings*. Additionally, EA identified concerns involving unidentified hazards, insufficiently defined hazard controls, and inconsistent performance of work within controls. EA also noted some safety and health infractions during construction work. One sitewide concern about NSTec was the lack of WP&C "triggers" to characterize potential beryllium legacy areas before performing dust-disturbing work in those areas.

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.

CCD-QA05.001, *NSTec Integrated Work Control Process*, requires all NSTec work to be performed in accordance with approved activity-level work documents (ALWDs). Each facility has a primary REOP and may have a secondary REOP, both of which include a description of the authorized scope of work. All observed work was covered by either a work package or a technical procedure. Additionally, NSTec addresses the planned scope of work in POD meetings and pre-job briefings.

At DAF, ALWDs 3001814946, *Fan Blower Motor, Glovebox Ventilation Blower Preventative Maintenance*, and 3001778034, *Air Handler PM Inspection*, clearly identify the purpose and scope for two preventive maintenance (PM) activities performed during the review, including hazards, controls, and steps required for lockout/tagout (LO/TO) of blower motors and servicing of blower belts and bearings. Similarly, the activity-level documents/work packages for 3001684786, *Installation of Flex Duct*, and 3001814946 (weekly) *Glovebox Ventilation Blower Preventative Maintenance*, also adequately define the work scope and steps necessary for working within radiological areas and implementing radiological control requirements.

NSTec accomplishes the work at the RWMC mostly through operating procedures, although work packages are used for non-routine operations. The primary REOP adequately describes the real property (including the Area 5A RWMC disposal cells) and the scope of work/safety envelope. NSTec Standard Operating Procedure (SOP)-2151.203, *Low-Level Waste Handling and Storage Program*, adequately addressed the observed activities. The incoming shipments are accurately listed on the POD, and the POD entries include a description of the type of shipment (e.g., drums, cask, and compressors) and whether a pre-job briefing is required for the activity. The operator rounds and daily pre-start walkdown

of Area 5 are appropriately addressed in SOP-2151.207, *Radioactive Waste Management Site Inspections*. Additionally, SOP-2151.234, *Radioactive Waste Operations General Craft Activities*, adequately addresses the skill-of-craft routine activities. These processes are sufficient for describing the scope of work for these routine activities.

At NPTEC, the EA team observed the general cleanup of non-hazardous materials and equipment, which was performed under a general cleanup work package initiated in November 2014 (several months after the accident involving explosion of a 55-gallon drum). The identification, categorization, and sorting of materials was systematic and rigorous, and materials were inventoried and sites photographed. EA also observed two POD meetings, each of which included a pre-job briefing for the day's planned cleanup activities. Hazards and controls presented at the pre-job briefing were appropriate for the planned activities. The instructions and work steps, as well as the JHA in the work package, were sufficient to identify the work process, hazards, and controls.

At the U1a Complex, EA observed NSTec performing construction work in accordance with work order 3001457909, *Fabricate and Install Containment Barrier in the 05 and 07 Drift*. The Type II work package included an adequate description of the scope of work, work instructions, and detailed drawings. The scope of work in the primary REOP NSTEC-0363, *U1a Complex*, adequately covers such construction activities. This construction work package was appropriately listed on the U1a POD. EA also reviewed a Diagnostic and Instrumentation work package. The work scope was adequately defined on the ALWD coversheet, in the work package, and in the JHA. This work package was listed on the plan of the week under the section for routine work packages. The scope of work is appropriately described in the secondary REOP JLON-0050, *Experiment Fielding and Execution at U1a*.

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.

CCD-QA05.001-003, *Job Hazard Analysis*, provides several mechanisms to ensure that work hazards are identified, analyzed, and documented. These include the planning team job aid, previously called the Activity Hazard Inventory Checklist (AHIC); the JHA; and the pre-task and post-task hazard review (PTHR). Additional analyses are conducted as required for radiological hazards, industrial hygiene concerns, and other topics. The safety envelope is defined in the primary REOP, which includes the documented safety basis, as appropriate. Unreviewed safety question determinations (USQDs) are also conducted as part of the job hazard analysis process to ensure the activity remains within the bounds of the safety basis hazard analyses.

At DAF, the EA team observed three work packages associated with PM blower surveillance prepared for weekly, quarterly, and annual maintenance. The work activities/packages contained basic information on hazards and controls that were necessary to properly perform the system inspections and assigned tasks. During observation related to work document 3001754220, *Lead Cleanup and Survey*, the maintenance superintendent did not have the results of prior lead sampling to support required personal protective equipment (PPE), or documentation of any measurements taken just before the conduct of cleanup activities, readily available to address workers' questions during the pre-job briefing. The toxic hazard work permit (THWP) reviewed at the pre-job briefing contained a statement under Special Instructions that "No respiratory protection required due to previous air monitoring results." After the workers' questions, the supervisor recognized that it was unclear how the negative exposure determination was derived to exclude use of respiratory PPE, so the supervisor appropriately paused the work evolution. The NPTec Industrial Hygiene (IH) subject matter expert (SME) revised the THWP to remove the statement referenced above and to include additional Special Instructions, including a statement that if the lead cleaning activity is different than stated in the work description, please contact IH for re-evaluation. However, the revised work package still lacked additional information about the results of prior IH

monitoring and/or exposure assessments. IH SMEs produced a process/activity exposure assessment from 2007 with air monitoring data that was used as the basis for the revised THWP. Although the IH SMEs believe the 2007 exposure assessment is the worst case, it provides no basis for determining the frequency of exposure assessments or the consistency of operational activities (i.e., materials and/or quantities that generated the lead contaminants) over the years. (See **OFI-NSTec-2**.)

At RWMC, the REOP refers to a documented safety analysis and technical safety requirements for Area 5. The Facility Execution Plan and the Support Execution Plan appropriately identify hazards associated with the RWMC facilities. NSTec performs JHAs in support of the Type II technical procedures.

During the observation of the NPTEC cleanup activities, NSTec was emptying a number of legacy containers, including older Conex containers and trailers, located near the "motels" and filling them with some of the salvaged materials from other site cleanup work activities. During the walkthrough of Conex P6-AL-6, EA identified a bucket of non-sparking tools that had not been surveyed or characterized under the NSTec beryllium program. In follow-up interviews, NSTec IH indicated that they considered such tools to be beryllium articles as defined by 10 CFR 850, *Chronic Beryllium Disease Prevention Program*, and therefore exempt from the NSTec chronic beryllium disease prevention program (CBDPP). Although the tools themselves are exempt, such tools have historically proven to be a primary source of beryllium dust at other DOE sites. The NSTec CBDPP has been effective in identifying over 40 legacy beryllium sites within the NNSS and characterizing and/or sampling most of the occupied buildings for beryllium, but most of the several hundred remaining unoccupied buildings/structures and buildings with limited occupancy have not been characterized and/or sampled for beryllium, including the Conex containers at NPTEC. Interviews revealed that NSTec IH expects to be notified before such buildings or structures become occupied and before dust-disturbing activities are planned within these structures, so that IH can evaluate the need for further beryllium characterization and/or sampling; this expectation is not formalized in procedures. During the cleanout of the Conex trailers at NPTEC, IH was not notified. As a follow-up to this concern raised by EA, NSTec IH conducted a site-wide search for additional non-sparking tools and identified multiple locations at the NNSS where beryllium alloy non-sparking tools were used. NSTec took beryllium swipe samples from the tools in various locations and the results of the swipe samples indicated the values exceeded the release criterion for beryllium and dermal exposure to beryllium was possible, although there was no indication that any NNSS workers had been exposed. On June 17, 2015 a Significance Category 4 DOE Occurrence Report (Report No. NA—NVSO-NST-2015-0016) was initiated by the site. (See **FIND-NSTec-1** and **OFI-NSTec-3**.)

The NNSS NSTec work control process has no work planning "triggers" to ensure that IH is consulted for beryllium characterization or sampling before dust-disturbing activities in unoccupied buildings or structures. NSTec work planners indicated that the only "triggers" for notifying IH of potential beryllium concerns are limited to the 40 or so pre-identified beryllium legacy sites identified in the Facility Data Base. Furthermore, there is considerable misinformation across the NNSS concerning which buildings have been characterized and/or sampled for beryllium. For example, a statement in the Centerra-Nevada Security Police Officer training course on beryllium hazards states that "The site Management and Oversight (M&O) contractor is characterizing each facility associated with NV operations" and that "Each facility is sampled in accordance with a statistical sampling plan for the presence of beryllium." The lesson plan does not point out that such characterization and sampling is limited to legacy sites or buildings that are continuously occupied and does not apply to numerous other NNSS structures and buildings such as the Conex trailers, where Security Police Officers may need to conduct searches or other protective force activities. (See **OFI-NSTec-3.)**

At the U1a Complex, Type II work package 3001457909, *Fabricate and Install Containment Barrier in the 05 and 07 Drift*, includes a USQD, an AHIC, a PTHR, and a JHA. In general, the AHIC and JHA appropriately identify hazards associated with the work tasks, such as welding, falling tools, worker/area

congestion, and aerial work. The JHA also identifies exposure to high or sudden thunderstorms, which is not applicable to underground work. Work package AAxx-SAL-SAL-0798, *Diagnostic and Instrumentation*, is a Type III work package and, although not required, includes a JHA in addition to an AHIC and a PTHR. The AHIC included a tabletop or walkdown with appropriate safety SMEs and technical SMEs. The AHIC, PTHR, and JHA were thorough and identified appropriate hazards and controls. This work package was classified as Type III because of the designated complexity of the work (Level 2 – somewhat easy). However, the work package instruction includes a warning that that the work involved high voltage up to 5kV and that failure to abide by approved key controls could result in exposure to high voltage shock hazards. Furthermore, the high voltage electrical hazard was selected on the AHIC, the PTHR, and the JHA. Per CCD-QA05.001, *NSTec Integrated Work Control Process*, this work complexity should have been Level 3 (level 3 electrical work $\geq$ 50 V). Level 3 complexity with serious consequences for work frequently performed is required by NSTec to be a Type II work package. EA notified facility management of this isolated case of incorrect classification of a work package.

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

CCD-QA05.001-003, *Activity Level Hazards Analysis Process*, is used to identify and analyze hazards and identify controls for activity-level work. The procedure includes the appropriate hierarchy of controls (starting with elimination of the hazard, then use of engineered controls, then use of administrative controls, and finally use of PPE). Although NSTec uses some engineered controls (e.g., ventilation, machine guarding, fencing), most of the hazard controls for the work that EA observed were either administrative or PPE. The administrative controls are included the technical procedures and work packages.

Technical procedures are the primary ALWD for the RWMC waste management operations, and NSTec has developed standing radiological work permits (RWPs) for routine work activities. As required by CCD-QA05.001-006, *Technical Procedure Process and Use*, the identified hazards are included in the Precautions/Limitations section. For example, SOP-2151.203, *Low-Level Waste Handling and Storage Program*, identifies the hazards associated with the observed work activities and includes appropriate Warning and Caution boxes. Similarly, SOP-2151.207 addresses the controls for identified hazards in the Precautions/Limitations section. The NSTec operating procedures at RWMC are generally well-written but contain some errors. For example, SOP-2151.203, Section 6.4, Step 8, says to lift off the secondary cover, when it should refer to the primary cover. This procedure, which is Type II, General Use, could not have been performed as written. EA communicated this observation to facility management, and corrective action has been taken. Additionally, IH collected noise monitoring data for RWMC operations involving fork trucks at portable loading docks. IH noise dosimetry results for this activity (P250-TG-10-0249) stated that the range of noise exceeded 104 dBA on numerous occasions, requiring double hearing protection for all employees evaluated, including the loader operators (i.e., forklift operators). This control was not specifically identified in the ALWDs. (See **OFI-NSTec-4**.)

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

For the observed facilities, NSTec verifies readiness to perform work on a daily basis using POD schedules, POD meetings, shift operations manager meetings, and/or pre-job briefings. Procedure CCD-QA05.001-007, *Plan of the Day/Plan of the Week*, describes the process for scheduling and authorizing work and is used to integrate activity-level work with planned operations. Pre-job briefings are addressed in Procedure CCD-QA05.001-009, *Pre-Job Briefings and Post-Job Debriefings.* POD/Plan of the Week meetings and pre-job briefings were conducted for all observed activities.

DAF work management personnel conduct a POD meeting each afternoon to review the scheduled work activities for the next day and again each morning to discuss any changed conditions. Maintenance work supervisors or the maintenance superintendent hold pre-job briefings for all involved workers before starting maintenance work activities. The pre-job briefings provide workers with relevant facility information, safety topics, and assignment of jobs for the day. Most observed pre-job briefings were well attended and detailed, and they effectively communicated job assignments, support needs, and work priorities. Workers performed most observed operations in accordance with ALWDs, written procedures, and required controls. Maintenance craft and radiological control technicians (RCTs) are experienced and knowledgeable of their assigned work activities, and they interacted with each other in a professional manner.

EA observed a few potential weaknesses related to the conduct and/or content of pre-job briefings. Pre-job briefings for Work Package 3001778034, *Air Handler Unit, PM Inspection*, did not include a review of the lesson learned (LL) contained within the work package. During this and one other briefing, the work supervisor often paused the pre-job briefing while attempting to identify the areas that were covered and/or needed to be covered while attempting to complete NSTec Form FRM-1063, (required in accordance with company directive CCD-QA05.001-009, *Pre-Job Briefings and Post-Job Debriefings*). The placement of documents within the work package did not match the order of checklist items, causing the supervisor to flip between package sections, reorder the package contents, and lose track of the items already discussed. Additionally, workers and the supervisor completed the signoffs before some items (e.g., the JHA) were discussed. LLs included in work packages and reviewed during pre-job briefings were not always directly applicable to the work activity. For example, Work Package 3001684786, *Installation of Flex Duct*, contained an LL related to receipt at NNSS of a contaminated waste shipment container from the Portsmouth Gaseous Diffusion Plant, and Work Package 3001754220, *Lead Cleanup and Survey*, contained a National Institute for Occupational Safety and Health bulletin and did not discuss local or DOE complex LLs for similar activities. (See **OFI-NSTec-1**.)

On March 25, 2015, a near miss occurred (and was documented in NSTec Case ID 2015-024) at DAF. Two workers (NSTec operator and subcontractor suspect/counterfeit inspector) were working at height in a scissor lift in the DAF corridor and within the swing radius of an active building's pneumatic-operated door when three experimenters began to exit through the door. The pneumatic door began to open before the two workers were able to move the scissor lift out of the swing radius. The three experimenters held onto the opening door to slow it down until the workers cleared the scissor lift. The door did not contact the scissor lift, and no injuries were reported. The near miss was immediately reported to the DAF Nuclear Operations manager, the maintenance superintendent, and the NNSS Industrial Safety SME. The subsequent investigation resulted in a recommendation to reinforce the protocol of not working within the swing radius of pneumatic-operated door without active control of the door (control of building or LO/TO of door). While EA noted that work planning deficiencies contributed to this event, the facility response to the near miss was appropriate and in accordance with NSTec requirements for incident response, reporting, and investigation but was not consistent with requirements for reporting to the DOE Occurrence Reporting and Processing System (ORPS). (See **OFI-NSTec-5**.)

At RWMC, EA observed a planning meeting for a Type B shipping cask activity; a Waste Acceptance Review Panel meeting; a work planning meeting; and a POD meeting (post-job briefings are included at the beginning of the POD meeting). The work planning meeting and POD meeting were effective in establishing what work was going to be accomplished. The POD included a post-job debriefing of the day's work; the status of expected waste shipments; how the work would be accomplished; and two LLs pertinent to the work. The POD was well attended, and there was good interaction with the crew. Overall, work was well planned and communicated.

EA observed a waste specialist performing daily pre-start activities at RWMC, including completing the Area 5 Low-Level Waste pre-start checklist and the mixed waste disposal unit Cell 18 round sheet. The waste specialist obtained the appropriate forms and conducted the rounds in a diligent manner. On the mixed waste disposal unit Cell 18 round sheet, he identified the "Loadout Tank Full/ Leak Detect Alarm" as unsatisfactory, and recorded the information appropriately. The housekeeping in the waste cell areas was good.

NSTec completed an activity involving the unloading of a Type A cask at RWMC. This activity is covered by SOP-2151.203, *Low Level Waste Handling and Storage Program*, and was included in the POD. The waste operations supervisor effectively conducted the pre-job briefing. The RCT discussed the applicable radiological controls and the RWP. The pre-job briefing was well attended, with good interaction. The RCT and a safety specialist provided appropriate support during the evolution, and one person in charge was controlling the work. The training records for the crane signal person were in order. The workforce has significant experience and is well qualified to perform the work. The Type A cask evolution was well planned and coordinated and was conducted in a controlled manner.

Other observed RWMC activities included the unloading of waste containers from a tractor-trailer in waste disposal Cell 20, which was also covered by technical procedure SOP-2151.203, *Low-level Waste Handling and Storage Program*. Ironworkers directed the flow of forklift traffic, and RCTs were in attendance, as well as a waste specialist. Personnel performing the work EA observed at RWMC were wearing appropriate PPE, except that the forklift operators were not wearing hearing protection during unloading of waste packages from inside a trailer. The area was appropriately posted as requiring hearing protection, in accordance with the two procedures that govern these forklift operations, SOP-2151.203, *Low-Level Waste Handling and Storage Program*, and SOP-2151.234, *Radioactive Waste Operations General Craft Activities*, which both require the hearing protection requirement to be posted at portable loading platforms or applicable work locations. EA asked the onsite safety specialist why the forklift operators were not wearing hearing protection, and was told that an IH assessment showed that they did not need it. This assertion was not correct, as discussed above in relation to OFI-NSTec-4. The forklift operators, with the concurrence of the safety specialist, were not following the established controls (e.g., posting for hearing protection) while performing work. (See **OFI-NSTec-4**.)

EA attended the POD for the U1a Complex, which was followed by the laboratory POD. The U1a facility manager conducted the U1a POD and also attended the laboratory POD. The laboratory POD included a list of the daily activities. Emphasis was placed on deconflicting work activities, and both PODs were performed effectively and in accordance with applicable requirements.

The Type III Work Package AAxx-SAL-SAL-0798, *Diagnostic and Instrumentation*, stipulates skill of the worker (SOTW) training requirements for the diagnostic and instrumentation workers. The training for a diagnostic technician performing the work met the SOTW requirements as defined in the work package.

NSTec workers were performing Work Package 3001457909, *Fabricate and Install Containment Barrier in the 05 and 07 Drift*. The work scope is to fabricate and install Plug #2 (Containment Barrier) in the U1a.05 extension drift. During work, the Facility Representative (FR) observed the following:

- A worker walked under the arm of the JLG articulating boom lift several times while the lift was in operation, in violation of the contractor process, CD-P280.043, *Aerial Work Platforms/Lifts*, which states: "Allow no one to stand on or pass under the elevated portion of any lift."
- A flexible ventilation duct was lying on the JLG arm while the JLG lift was moving side to side, creating undue stress on the flexible duct and the permanent ventilation duct in the overhead. The contractor lead had not identified the hazard introduced by the undue stress on

the flexible ventilation duct as required by CD-P280.043 *Aerial Work Platforms/Lifts*, which states: "Observe operator performance to ensure that safe work practices are being followed."

- Two portable ladders were stored up against the drift rib in a work area, creating a narrow walkway between the drift rib and the JLG tires. This housekeeping issue had not been addressed before work began in accordance CD-P280.001, *Housekeeping*, which states: "Keep work areas, passageways, stairways, and all other areas free of debris, equipment, and materials" and "Maintain all areas in a safe, secure, and orderly condition, because housekeeping is the responsibility of every person."

The DOE FR discussed these concerns with the contractor lead and was informed that the worker had also passed under the arm of the JLG on the previous day. The contractor lead immediately talked with worker who walked under the arm of the operating JLG, had the flexible ventilation duct tied up away from the JLG arm, and had the ladders moved out of area.

5.3 Strategic Partnership Projects (Formerly Known as Work for Others)

NSTec Company Directive (CD)-0300.007, *Work for Others*, defines work for others (WFO) as the performance of work for non-DOE entities by DOE contractor personnel and/or the use of DOE facilities that is not directly funded by DOE appropriations. Typical customers include branches of the military, the Defense Threat Reduction Agency, other DOD agencies, the Department of Transportation, and the Department of Homeland Security. Per discussion with the NSTec Global Security managers, WFO activity-level work follows the approved NSTec procedures. If the WFO customer plans to do the hands-on work, a secondary REOP is required, and NSTec SMEs are required to conduct a review to ensure that the processes are equivalent. Although NSTec has an active strategic partnership projects (SPP) program, formerly known as WFO, EA did not identify much activity-level work during onsite data collection.

EA observed elements of two SPPs at NNSS during this review. The first program was the initial planning stages of the Passenger Railcar Chemical and Improvised Explosives Seminar and Test (PRCIEST), which is sponsored by the Federal Bureau of Investigation (FBI) Chemical Countermeasures Unit. It consists of two separate tests, one requiring an improvised chemical device and the second an explosive device. The NSTec plan is that each device will be detonated in one of two rail cars provided by the FBI and located in the Frenchman Flats area of the NPTEC site. The FBI scope is limited to data collection, with no direct-contact work. The work is performed under a NSTec primary REOP with no secondary REOP, since the sponsor's work scope is limited to data collection. The NSTec team is responsible for initial test setup, which will be addressed in an NSTec construction work package. NSTec personnel are also responsible for rigging the chemicals and explosives, installing and monitoring the sensors, performing the tests, securing the site after the detonations, and providing the sensor data to the FBI for their analysis. The test performance is covered under a separate NSTec work package. During week one of EA's onsite data collection visit, EA observed the initial walkdown for placement of the two rail cars at Frenchman Flats, prior to and in support of the development of the construction work package. The walkdown was informative and well attended by NPTEC and NSTec program managers, staff, NSTec and NFO SMEs, and Global Security project personnel. The NSTec construction work planner responsible for developing the construction package was not in attendance, so a second walkdown was performed before the EA team arrived for the second data collection visit.

EA also observed the planning and initial dry run for the source physics experiment (SPE) project, which is designed to provide ground truth data to create and improve ground motion and seismic wave generation and models for explosions. The experiment involves well logging, drilling and coring studies, detonation of explosives at varying depths, and recording of explosions on seismic instruments. From a work control perspective, the SPE project team consists of participants from NSTec Global Security Defense Experimentation & Stockpile Stewardship, and NSTec construction, as well as participants from

the Defense Threat Reduction Agency, LLNL, LANL, Sandia National Laboratories, and the University of Nevada (Reno). NSTec is the primary REOP holder for the overall activity, and LANL is the secondary REOP holder for explosive operations. NSTec is responsible for construction, operations, and infrastructure; LLNL is the designer of the crucible that will hold the explosives package; and LANL is responsible for the explosives and detonation. All of the participants are involved in sensor placement and data retrieval. Overall coordination and integration among the SPE team participants and partners was comprehensive and effective. The level of project integration was an improvement from the multi-organizational project teams observed by DOE Independent Oversight in 2007, when the focus on individual contributions overshadowed the importance of a teaming relationship. The only concern identified by the EA team was some confusion regarding the purpose of the daily morning all-hands meeting. NSTec has two separate CCDs, one addressing pre-job briefings and another addressing PODs, and the all-hands meeting did not fully meet the requirements of either directive. EA shared these concerns with the SPE project supervisor, and changes in meeting content, structure, and attendance rosters were reported to the EA team the next day.

In general, the SPP WP&C elements observed by EA at both PRCEIST and SPE were adequate to ensure that the work observed was conducted in accordance with established controls. Concerns noted by the EA team, such as the confusion regarding POD and pre-job briefings at the SPE project, were corrected during the EA assessment. Overall, EA noted improvements since a 2007 review of WFO projects, particularly in integration and communication among the various participating organizations.

5.4 Joint Laboratory Office-Nevada Work Control

The JLON represents LLNL and LANL in Nevada within the construct of the NvE. JLON-PRO-900 establishes the framework for implementing NNSA/NFO requirements for national laboratory activities at NNSS. This document identifies roles, responsibilities, and requirements for implementing the REOP process and NNSS specific requirements for laboratory programmatic work managed by JLON.

EA observed work evolutions associated with four JLON-managed projects at the DAF including the National Criticality Experiments Research Center (NCERC) managed by LANL, as well as Nuclear Material Operations (NMO) associated with Nuclear Counterterrorism (NCT) activities, staging and glovebox operations, and computed tomography (CT), all managed by LLNL.

JLON has established appropriate WP&C processes that encompass DOE integrated safety management policy while ensuring that NNSS/NFO-specific requirements are met for all activities sponsored and performed by the national laboratories at the NNSS. Work activities for JLON-managed operations at DAF are generally defined broadly in operating permits and primary ALWDs, which for the most part are sufficient to permit identification of the range of activity-level hazards and controls associated with the work. In most cases, work scopes are further defined in subordinate plans and procedures that effectively tailor broadly defined hazards and controls to specific work evolutions. The work observed by EA followed the appropriate hierarchy of controls, including engineered controls, administrative controls, and PPE when necessary. JLON management confirmed readiness to perform work each day, and the observed pre-job briefings were thorough and complete. Still, EA observed a few weaknesses in overly broad work scope definition for one evolution and in the proper specification and implementation of radiological controls, including contamination control, air sampling, and extremity dosimetry.

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.

Scopes of work for JLON-managed operations at DAF are defined in specific JLON secondary REOPs and JLON-approved work packages. All observed work was appropriately governed by a primary and secondary REOP and by a JLON work package prepared consistent with the requirements of JLON-PRO-900. Some operations were also supported by subordinate plans and procedures intended to govern specific activities.

Individual scopes of work for observed activities at DAF are generally defined broadly in REOPs and Integration Work Sheet (IWS)/Integrated Work Document (IWD). For the most part, they are sufficient to permit identification of the range of activity-level hazards and controls associated with the work. Subordinate plans and procedures further tailor the hazards and controls from the IWS/IWDs. For example, secondary REOP JLON-0067 covers LLNL CT operations in DAF and adequately defines the scope of work and the discrete activities covered by the REOP. Work package JLON-ALWD-DAF-0017, *LLNL Computed Tomography*, includes IWS 18011.01, which further refines the work scope into discrete tasks. A supporting operating procedure, PSP-OP-031, *Computed Tomography at DAF*, contains work instructions that convey the workflow and actions to be taken for completing each of the tasks defined in the IWS. Similarly, secondary REOP JLON-0053, *NCERC Operations*, covers LANL criticality operations and radiation test object (RTO) design and construction work taking place in the DAF. JLON work package JLON-ALWD-CEF-0001, *NCERC Operations*, further refines the work with four LANL IWDs covering the range of NCERC operations. The EA team observed RTO construction and measurement activities, which fell under the IWD for subcritical operations. Work tasks and steps associated with this activity were adequately defined in the IWD and further tailored through LANL SOP CEF-SOP-RTO-019, an in-hand use procedure that details the steps and workflow.

Although the above examples show that the high-level work scope definitions in REOPs and IWS/IWDs can be effectively refined and tailored through subordinate work scope mechanisms such as specific plans and procedures, this was not the case for all observed JLON work. Specifically, REOP JLON-0054, *LLNL Nuclear Material Operations*, addresses the use of special nuclear materials in specified buildings at DAF. The REOP and two IWSs define a series of broad tasks for this work. While the IWSs adequately identify the collective range of hazards that could be encountered during performance of these tasks, specific scopes of work are not always further defined in subordinate documents that define the specific scope for the day and/or the associated work steps where workers would encounter specific hazards identified in the IWS. For example, during an observed evolution involving taking radiation measurements from various detector/source shielded configurations, the RWP in use was selected on the basis of the responsible manager's (RM) personal knowledge of the radiation source to be used, rather than on a documented scope of work with sufficient information to make this determination. (Several RWPs could have supported the same type of work, depending on the specific conditions or hazards associated with various radiation sources that could be used.) The IWS did not provide linkage to specific RWPs, and the RWP used was for "short term nuclear material unpacking/repacking including evaluation of nuclear material previously opened in the last 30 days." However the available work scope information did not indicate the previous opening time. In addition, according to the pre-job briefing, cadmium hazards would be encountered, and certain parts to be handled could present a potential for radiological contamination. Since no documentation describes the specific work steps or workflow associated with this activity (e.g., work instructions, procedure), direction on the hazard controls from the IWS (e.g., the need for gloves and radiological contamination surveys of certain parts) sometimes must be provided by the knowledgeable RM rather than by work instructions or the RWP, depending on the knowledge level of personnel involved in the work. The RCT covering the work was new to DAF and was not familiar enough with the workflow to know which items required surveys and when these would need to be performed. The RWP generically identified the need for radiological contamination surveys but provided no details on when they were required, and the RM for the work provided this direction for the RCT. (**See OFI-JLON-1**.)

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.

JLON implements each of the national laboratories' respective work control processes and hazard analysis through LANL Procedure P300, *Integrated Work Management*, or LLNL Institutional ES&H Document 2.2, *LLNL Institution-Wide Work Planning and Control Process*. The resulting work control documents (i.e. IWDs for LANL and IWSs for LLNL) define hazards and controls and establish line management responsibility and accountability for worker safety and security.

For observed operations performed by both LANL and LLNL, the hazards associated with the work were adequately identified, analyzed, and documented in the applicable IWSs and IWDs. While somewhat different in terms of format and content, IWSs and IWDs generated by the home laboratory work control processes each contained task-based work breakdown, along with the general hazards and controls for work to be performed under each task.

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

Engineering and administrative controls are used whenever possible to mitigate activity-level hazards during JLON work at DAF. Facility engineered controls consist of interlocked access control systems, containment and enclosure devices, and ventilation systems. These are supplemented by administrative controls, and PPE if necessary, to mitigate hazards. Administrative controls include work permits, postings, and administrative and operations plans and procedures. In addition to the JLON work control process in JLON-PRO-900, JLON, along with LANL and LLNL home laboratory personnel, have also developed comprehensive supplemental plans and procedures intended to ensure proper application of safety and health requirements during their work at DAF.

The home laboratories have further clarified implementation of IWS and IWD safety and health in subordinate plans and procedures. For example, for LANL NCERC activities, CEF-PLA-006, *Radiation Protection and Contamination Control at NCERC*, describes the radiological controls to be implemented for the NCERC based on the JLON radiological protection program. RTO work observed by EA was also governed by an in-hand use, specific NCERC RTO Construction Procedure, as well as an SOP covering required criticality controls. For LLNL glovebox work, GB-PLA-001, *DAF Glovebox Safety Plan*, was developed to specify the safety controls for staging material and glovebox operations within DAF. The controls in this plan supplement the requirements in the LLNL ES&H Manual for work at DAF. For LLNL radiography operations in DAF, Operating Procedure PSP-OP-031 R02, *Computed Tomography at DAF*, provides detailed operating procedures for CT, digital radiography, and film radiography radiographic techniques for the evaluation of encapsulated special nuclear material.

Overall, controls for most hazards within JLON activities were adequately identified and implemented. However, EA identified some problems with the specification and implementation of some radiological controls during NCERC work and DAF glovebox operations, as described below (see **OFI-JLON-2** and **OFI-JLON-3**.):

- Radiological survey and monitoring practices during glovebox work may not be sufficient to detect and prevent the inadvertent spread of low levels of contamination. During glovebox work and associated hot breaks in a radiological buffer area (RBA), the RCT did not always take and count technical smears on a portable swipe counter with the sensitivity necessary to detect 20 dpm/100 cm^2 of alpha contamination (the threshold for a contamination area). For example, during bag in activities, the RCT used masslin cloth to wipe around the bag-in port and cover and field-counted the masslin using a portable rate meter with a much poorer detection capability than

can be achieved with a technical smear. Technical smears were not taken during the bag in activity. (See **OFI-NSTec-8**.)

- DAF lacks automated hand and foot/personnel contamination monitoring equipment for personnel egress and relies on self-survey, which is of variable effectiveness. According to DOE Guide 441.1-1C, *Radiation Protection Programs Guide for Use with Title 10, Code of Federal Regulations, Part 835*, automated whole body frisking devices should be considered in order to produce consistent results. (See **OFI-NSTec-8**.)
- RCTs did not perform job-specific grab air sampling as required to characterize potential airborne concentrations when respirators were required to be worn during glovebox hot breaks. In accordance with RWP # LL14-006, respirators were required during this portion of glovebox operations. Specific instructions were not provided in the RWP to specify what actions to take prior to removal of respiratory protection. The RCT incorrectly stated that the fixed air heads in the area support removal of respiratory protection and air sampling needs. However fixed air heads are not adequate for this purpose per NSTec and LLNL procedures. After the observation was over, JLON indicated the respiratory protection is worn as a best management practice and that no airborne radioactivity is expected. JLON also stated that evaluation of workplace indicators (e.g., contamination survey results) with no detectable contamination is adequate to support removal of respiratory protection. JLON indicated RWP #LL14-006 is an older RWP and that it is scheduled for revision. The JLON health physicist indicated additional detail will be provided in the revision to ensure appropriate actions are specified for air sampling and to allow removal of respiratory protection. (See **OFI-JLON-2**.)
- NCERC RWP LA14004 lacks sufficient specificity regarding the need for extremity dosimetry during RTO work. The RWP states that extremity dosimetry is required for extended (more than five minutes) hands-on work with nuclear material, in contrast to the criteria in CEF-PLA-006, *Radiation Protection and Contamination Control Requirements at NCERC*, which states: "At a minimum, extremity dosimeters will be worn for NCERC radiological work if, based on the As Low As Reasonably Achievable (ALARA) review determination dose estimates, individual extremity dose for that activity when the contact dose rate is greater than 10 times the 30-cm dose rate and the contact dose rate is greater than 50 mrem/hr." The ALARA review determination for this RWP did not evaluate the dose gradient against the above criterion, although the calculated handling time per evolution was shown as 9 minutes using a 100 mrem/hr average dose rate. The RWP contained no time restrictions on handling, and the actual contact neutron plus gamma dose rate for the observed evolution exceeded 200 mrem/hr. The fissile material handler was not wearing extremity dosimetry during this evolution. (See **OFI-JLON-3**.)

EA did not observe similar contamination control and air sampling concerns during LLNL CT work in DAF. In this case, workers unloaded the source using an RWP that clearly specified the needed radiological controls, including precautionary posting of the area as a CA, dress-out and respiratory protection during source unloading, job-specific air sampling, and the use of technical smears to be counted on a swipe counter for down-posting the area if no contamination was detected during the evolution. The CT RWP was developed more recently than the glovebox work and, based on interviews with radiological staff, reflects management's desire for more prescriptive radiological controls.

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

DAF publishes a weekly work schedule and holds formal POD and pre-shift meetings to prioritize and authorize individual activities for each shift. These meetings were sufficient to ensure appropriate resource availability and to minimize and manage potential schedule conflicts. The published schedule is well-organized and includes linkage to controlling work packages governing each activity.

EA observed several JLON pre-job briefings that were informative and included good engagement and participation by workers. An NSTec DAF supervisor was assigned to supervise each job and provided facility-level input to the pre-job briefings, such as facility conditions and emergency contacts and response actions. JLON personnel and NSTec RCTs conducted the hands-on portions of the pre-job briefings, including tasks for the day, and discussed non-radiological and radiological hazards and controls.

Workers in DAF were experienced and knowledgeable, and the observed work was performed in accordance with approved and authorized work packages and within established controls. For example, NSTec's initial setup and operation of the linear accelerator followed an in-hand SOP and used the reader/verifier technique to ensure proper performance. NSTec also conducted the handoff to LLNL for CT according to an in-hand operating procedure.

5.5 Centerra-Nevada Work Control

Centerra-Nevada provides protective force services to safeguard special nuclear material; engineering and electronic security systems services that encompass the design, installation, operation, maintenance, and testing of electronic security systems (ESS); and technical security services as well as external and support services in support of their contract requirements. Centerra-Nevada WP&C can be segregated in the following three distinct but related categories: protective force, training, and ESS. The work control process for the protective force is implemented through operations orders and procedures, and the training element includes classroom training with lesson plans, student training manuals, and risk assessment plans. Additionally, Centerra-Nevada conducts Limited Scope Performance Testing (LSPT), specific physical Force-on-Force actions (Aspects of the Battle) and full Force-on-Force Exercises to validate training and evaluate actions against adversary forces. Training is driven by an all-encompassing mission oriented guideline called the Enterprise Mission Essential Task List which identifies individual and collective tasks required to protect NNSS facilities through a model oriented on adversarial Deterrents, Detection Actions, and Denial procedures. The ESS work control process is implemented through Type III work packages and procedures and typically follows the NSTec work package process as defined in NSTec CCD-QA05.001-005, *Work Package Process*. During this review, EA observed protective force requalification training, reviewed Centerra-Nevada procedures and work packages, and interviewed Centerra-Nevada facility, training, and ES&H staff.

Overall, the Centerra-Nevada WP&C processes are adequate to ensure that work is conducted safely. Work scopes are sufficiently defined, and most hazards are analyzed and controls are appropriately selected. Workers are trained and qualified, and work is conducted in a planned, coordinated, and controlled manner. However, EA identified some concerns with respect to not following all elements of the Centerra-Nevada work control procedure as written, insufficient Centerra-Nevada IH exposure sampling data, the lack of integration of ES&H SMEs into the REOP review process.

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.

With respect to ESS, Type III work packages are well developed and robust. Centerra-Nevada prepares work packages in accordance with NSTec requirements for Type III work packages, and the NSTec facility manager appropriately authorized the packages for those facilities in which Centerra-Nevada ESS work is performed. Post-job briefings typically include supplemental notes provided by the workers, with specific feedback and improvement suggestions. Documented pre-task hazard reviews identify the appropriate work hazards and hazard controls, which were implemented in accordance with the work package. An area of concern is that in some cases, Centerra-Nevada staff did not follow Centerra-Nevada

Policy PI-07, *Work Control*, as written. For example, Section C.1 of PI-07 states that the Centerra-Nevada Director of the Safety, Training and Performance Division "approves or delegates to a safety professional approval of all Job Hazard Analysis and the content of Pre-task Hazard Reviews." However, a Centerra-Nevada safety professional is rarely involved in the approval of ESS JHAs or ESS pre-task hazard reviews, which are typically approved only by the work supervisor. In another example, PI-07 states that the same Centerra-Nevada Director "approves or delegates to a safety professional approval of the Skill of the Craft list prepared by the ESS Section Manager". However, a Centerra-Nevada safety professional is rarely involved in the approval of the Skill of the Craft list as required by PI-07. (See **OFI-CN-1**.)

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

EA observed the training and annual requalification of security police officers during a limited-scope performance test (LSPT). The requalification process involves an initial briefing/training followed by an instructor-guided live-fire functional performance test on one or more of the NNSS firing ranges, including the Live Fire Shoot House. The security briefing addressed the appropriate items on the range training safety check sheet, and afterward each student performed an instructor-observed demonstration of loading, unloading, and clearing malfunctions on the firearms they would use during the LSPT. Preparations for and performance of the LSPT were completed in accordance with the training plan. Hazards and controls for the LSPT are well-documented in three Centerra-Nevada risk analysis reports associated with tactical maneuver training, live fire activities in training, and the Live Fire Shoot House. A sample of reported hazards and controls for the Live Fire Shoot House were found to be appropriate for the activity observed.

Before 2009, the primary NNSS contractor (NSTec and predecessor organization) performed the ES&H responsibilities, including IH sampling, as requested for the protective and security force. Since then, the Centerra-Nevada ES&H group has provided the bulk of IH evaluations and monitoring and sampling for the protective force and associated activities and facilities. Centerra-Nevada has performed a baseline set of 27 IH health hazard evaluations to date; however, a few of the reports took up to ten months to complete. Centerra Nevada is working to expedite the completion of these reports.

In December 2006, significant exposures to carbon monoxide (CO) above Immediately Dangerous to Life and Health levels were identified in the DAF when firing blank ammunition in engagement simulation system weapons. The incident resulted in an occurrence report (NA-NVSO-WSIN-NTS-2006-003) and limitations on the use of blank ammunition inside the DAF except when shooting in designated locations; Airsoft weapons are now used within the DAF except in designated locations. Even with shooting blank ammunition only in designated locations, carbon monoxide levels were measured in 2006 at 182 ppm, exceeding the American Conference of Governmental Industrial Hygienists (ACGIH) upper excursion limit of 125 ppm for carbon monoxide. Airborne lead concentration measurements in May 2012 indicated airborne concentrations that, when adjusted for a full-shift time-weighted average, was below the ACGIH threshold limit value for lead. However, the practice of shooting blank ammunition in designated locations continues today, and the limited sampling data on carbon monoxide and lead, as well as the lack of IH data for other potentially toxic gases and airborne metals from firing M200 blank ammunition, does not support a comprehensive characterization of the potential for protective force member exposures during this activity. (See **OFI-CN-02**.)

Since the NNSS protective force provides a continuing and active presence at most of the NNSS work sites and facilities, Centerra-Nevada is the primary or secondary REOP holder for 22 NNSS site locations

and/or facilities. Centerra-Nevada implements the NNSA/NFO order on REOPs through Centerra-Nevada Standard Practice SP1-012. Most of a sample of REOPs generated by Centerra-Nevada met the NNSA/NFO and Centerra-Nevada requirements for REOPs, except in one case where hazards were missed. Within Building 06-CP-41, engagement simulation systems, which involve the use of low powered lasers (up to and including Class 3b lasers), are zeroed on an engagement simulation systems firing range, and blank ammunition and explosives are stored in an adjacent structure. However, the REOP for this facility (REOP CNV-0006) does not identify the hazards of the lasers or the explosives/ munitions. (See **OFI-CN-3**.)

Centerra-Nevada ES&H staff do not typically review the Centerra-Nevada REOPs. Although the REOP procedures do not require such a review, a number of the hazard analysis questions posed by the REOP process may best be answered by ES&H SMEs. For example, a typical REOP includes a five-page Risk and Hazard Questionnaire to identify and address potential security and ES&H hazards. One page of this questionnaire includes 15 questions under the topic "Will the scope of work involve industrial hygiene?" Although Centerra-Nevada reviews its REOPs annually, the Centerra-Nevada ES&H organization has not reviewed any of the Centerra-Nevada REOPs in over two years. Although the ES&H staff review selected REOP's as requested by the Centerra-Nevada REOP Coordinator, the current Centerra-Nevada ES&H Manager, who is also the Centerra-Nevada industrial hygienist, does not recall ever reviewing a REOP, and acknowledges that he is generally unfamiliar with the REOP process. A number of NSTec site organizations' staff members interviewed by EA found an ES&H SME review to be a prudent practice. (See **OFI-CN-3**.)

5.6 Contractor Assurance

Objective: The Contractor Assurance System produces periodic scheduled and non-scheduled evaluations (e.g., self-assessments, independent assessments, management walkthroughs, etc.) of WP&C activities which identify issues, concerns and opportunities for improvement in the WP&C program.

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EA evaluated the establishment and implementation of feedback and improvement program processes that evaluate and ensure NSTec compliance with WP&C requirements and guidance established by DOE. EA reviewed the scheduling of WP&C assessments, the results of these assessments, and the corrective action system used to drive improvements in NSTec WP&C processes.

CD-W200.001, *Joint Assessment Schedule (JAS) Development*, establishes the framework for the development, maintenance, submittal, and responsibilities for the JAS. The RM is responsible for ensuring that assessments are performed at the appropriate frequency, using a risk based process (unless otherwise specified by contract). NSTec uses the performance adjusted risk prioritization process implemented in CD-W200.001. The JAS provides NNSA/NFO with a tool for monitoring contractor assessment activities while maximizing the efficiency of NNSA activities. NSTec develops and submits an annual assessment schedule to NNSA/NFO before August 15 of each year; NNSA/NFO then develops the Assessment Implementation Plan (AIP), which takes into consideration NSTec's assessment schedule. These processes are adequate to ensure that NSTec schedules the appropriate WP&C assessments.

NSTec currently schedules and performs WP&C assessments in accordance with the JAS for 2014 and 2015. In 2015, NSTec has scheduled eight such assessments, including management assessments implemented by CCD-QA09.001, *Management Assessment Program*; independent assessments implemented by CCD-QA10.001, *Independent Assessments*; and surveillances implemented by CCD-QA09.002, *Surveillances*. EA reviewed 4 independent assessments reports, 13 management assessments,

and 4 surveillances from fiscal years (FYs) 2013, 2014, and 2015. NSTec developed formal criteria review and approach documents (CRADs) for the management and independent assessments reviewed.

Three of the four independent assessments reviewed were assessments of facility manager programs, with a CRAD section identified as work control/deconfliction and an associated checklist that evaluated the facility manager, the facility training, authorization of work packages, and maintenance of POD documentation. The fourth was an independent assessment of WP&C using the Energy Facility Contractors Group (EFCOG) CRADs. All of these assessments were comprehensive and identified findings, observations, and opportunities for improvement (OFIs), as well as LLs for improving the assessment process.

Some of the management assessments EA reviewed would have been more effective if they contained performance observations. For example, Management Assessment MA-13-G075-001, *Work Planning Implementation Assessment*, analyzed hazards that could potentially affect workers, the environment or the facility were by reviewing selected work packages and interviewing work planners. However the assessors did not perform any observations of the work packages in use and consequently could not validate whether the work package addressed the hazards actually encountered in the field and whether the established hazard controls were appropriate for actual field conditions. In another example, MA-13-G075-002, *Skill of the Worker*, assessed the SOTW program against CCD-QA05.0001-004, *Skill of the Worker*. However, again the assessors did not actually observe the work documents in use and did not gain essential insight into either document detail or worker skill as applied in the field. In a third example, MA-13-G075-003, *IPOW/POD Compliance*, assessed the implementation of CCD-QA05.001-007, *Plan of the Day/Plan of the Week*, in high hazard nuclear facilities only through a documentation review and interviews with facility managers and did not observe or evaluate the performance of any actual PODs or plans of the week. DOE and NSTec management stated that actions are under way to move the site from compliance-based observations to performance-based observations, which they stated would address EA's observations. (See **OFI-NSTec-9**)

Examples of management assessments that included performance observations were MA-13-H000-006, *Environmental Restoration Work Control Implementation*; and MA-14-X150-001, *Activity Level Work Control Processes at RSL Facilities*, at the Remote Sensing Laboratory (RSL). Seven of the management assessments reviewed contained findings, and most contained OFIs. Overall, these assessments add value by providing effective feedback to line management.

EA reviewed three surveillances. Although they are narrow in scope by design, they are effective in identifying issues that show inconsistencies, errors, and incompleteness of work package documentation.

Overall, the NSTec assessment process identifies and drives improvements in WP&C processes. Pending NSTec improvements in the issue management system are designed to increase the effectiveness of assessments. The Performance Assurance Division is also restructuring its assessment program to achieve a performance-based approach.

EA observed a potential weakness in the assessment process, which NSTec also recognizes, as stated in the Integrated Management Improvement Plan (IMIP) originated in September 2013. An action in the plan states: "Examine the disposition authority currently afforded the RM when dealing with issues and adjust as warranted." PD-0001.003 *Contractor Assurance System Description*, states "The issue priority level (significance) is determined by the Responsible Manager in accordance with CCD-QA03.001 *Issues Management*, prior to issue entry into the issues management system."

Allowing the RM to determine the levels of issue priority can result in issues not being analyzed properly. Accident Investigation Board report *Chemical Explosion at the Nonproliferation Test and Evaluation*

Complex (NPTEC) on June 13, 2014 identified problems in the way the RMs were handling issues that were not in accordance with procedural expectations. These include: placing issues on hold with inadequate justification, the under-categorization of issues, and not processing (i.e. not entering in the caWeb tracking system) issues that were identified in assessments.

Through document reviews (procedures, metrics, and the Integrated Management Improvement corrective action plan) and interviews with the Performance Assurance and Assessments Manager and the Issues Management and Performance Improvement Manager, EA confirmed that RMs can determine issue priority, waive Issues Screening Team (IST) recommendations, use extended timelines to address issues, and cancel with justification (where full resolution is not achievable due to project termination, operating facility decommissioning, contractual changes, or acceptance of risk) issues that are in the issues management system. This authority could compromise the effectiveness of the assessment process, because the RM is also responsible for implementing corrective actions associated with assessment results.

NSTec has not completed corrective actions to address the self-identified issue management deficiencies, so EA could not evaluate the planned modifications. Some of the planned corrective actions are to revise CCD-QA03.01, *Issue Management*, so that issues can be entered into the issue management system prior to discussing the issue with the RM, and to revise the IST charter to give the team more authority in the categorization of issues.

CCD-QA03.001, *Issue Management*, does not describe IST roles and responsibilities in the issue management process but points out that the IST functions are described in CHTR-QPID.002, *Issues Screening Team Charter*. (See **OFI-NSTec-6**.)

As noted above in Section 5.2, a near miss was reported at the DAF on March 25, 2015. Two workers were working in a scissor lift in the DAF corridor within the identified swing radius of a pneumatic door. The door was activated when three other workers were leaving the building. The three workers exiting the building held onto the opening door, decreasing its speed and allowing the scissor lift to be moved out of the swing radius. The RM determined that this event was not reportable under ORPS but reported it as an NSTec internal near miss. This event could have been reported in ORPS as a management concern (Group 10 – Management Concerns (3) 1-3, "A near miss to an otherwise ORPS reportable event, where something physically happened that was unexpected or unintended, or where no or only one barrier prevented an event from having a reportable consequence."). (See **OFI-NSTec-5**.)

Objective: The contractor analyzes, tracks, trends internally and externally identified issues and concerns; evaluates this information against established performance objectives and expectations (i.e., measures and metrics); develops and implements corrective actions; and conducts effectiveness reviews to ensure continued improvements in the WP&C program.

NFO raised concerns about the NSTec issue management system in May 2013, and the NSTec Annual Assessment Report and the President's State of the Company acknowledged concerns about the NSTec issues management processes. In September 2013, the IMIP was issued. Between May 2014 and July 2014, seven incidents called the NSTec issues management program into question and resulted in a letter from the NFO Manager to the NSTec President. In August 2014, NSTec created a "Get Well Plan" that revised the IMIP to include an Issues Management Improvement corrective action plan, which was placed on hold (September 2014) so that a detailed project plan could be developed. In December 2014, NSTec developed a detailed project plan, which NSTec management approved in February 2015. At the time of this EA review, no modifications of the issues management procedure and processes had been implemented, so EA could not determine their effectiveness.

EA reviewed the project plan and interviewed the Issues Management and Performance Improvement Manager and the Performance Assurance and Assessments Manager. The discussion covered detailed tasks to improve issues management, such as the revision of the issue management procedure, a communication plan to communicate issues, a training needs analysis, changes in issue originating and reporting, detailed performance metrics, the performance of an annual survey on the issue management system, and changes to the issue tracking system (called caWeb). These managers are knowledgeable of the weaknesses identified in the causal analysis and are working to improve some aspects of the issues management program detailed in the project plan.

Issues are managed using procedure CCD-QA03.001, *Issue Management* (now being revised), which provides guidance for issue identification, evaluation, analysis, data entry into caWeb, issue tracking, corrective actions, and post-closure activities. This procedure is augmented by NSTec procedures OP-T400.001, *Corrective Action Verification*, and OP-T400.002, *Corrective Action Effectiveness Validation*. These NSTec procedures provide the processes that are intended to ensure that corrective actions are verified and validated and are used to verify the effective closure of priority level 1 and 2 issues. No level 1 or level 2 issues have been identified related to WP&C or issues management in the last 5 years.

EA also reviewed WP&C level 3 issues and OFIs entered into the issue management system, as well as the apparent cause analysis and the corrective action plans for the level 3 issues. The analysis and corrective action plans adequately addressed the issues.

NSTec performance metrics are maintained on a web-based dashboard accessible to all NSTec and NNSA/NFO employees. Procedure CCD-QA03.005, *Performance Measurement/Metric Development, Dashboard, Posting, Updating, and Retirement*, establishes lifecycle processes for the performance measures and metrics. EA reviewed the Performance Metric Dashboard (further discussed in Section 5.6) for the performance assurance and WP&C elements. The performance assurance sub-elements are issues management, assessments, operating experience/LL, metrics, and process improvement. Issues management and assessments were rated yellow from September 2014 through January 2015. This rating is consistent with the problems identified by NFO related to the issue management system although the metrics have a subjective quality. The reviewed performance assurance metrics do not have established goals or action levels, however the following performance metrics do have action levels: Secret Internet Protocol Router (SIPR), % overdue issues / actions, % of corrective action plans completed on time and management assessment performance. The WP&C metrics under development are planned to include outputs based on work analysis and measurement, work execution, work planning, and work scheduling. (See **OFI-NSTec-7**.)

5.7 Nevada Field Office Oversight

EA reviewed the NFO oversight processes to determine their effectiveness with respect to AL-WP&C. EA reviewed NFO oversight of the CASs, the NFO management oversight processes, and the FR program with respect to AL-WP&C.

Objective: DOE field element line management has established and implemented effective oversight processes that evaluate the adequacy and effectiveness of contractor assurance systems and DOE oversight processes.

NFO's line oversight model is described in NFO P 226.X, *NNSA NFO Line Oversight System Description Document*. NFO's line oversight is a risk-informed/performance-based system that uses information from the CAS to influence the level of oversight provided. NNSA Policy NAP-21, *Transformational Governance and Oversight*, defines a process (an affirmation review) for validating the Line Oversight/CAS system involving self-assessments and an independent NNSA Federal team review. An

independent team comprised of senior NNSA and contractor staff conducted an affirmation review in 2012 and found this system for NFO and NSTec to be effectively implemented.

An additional aspect that was recently implemented is the Executive Council (EC) oversight program, which is documented in the two-page *Executive Council Guidance – Field Presence and Customer Liaison*, dated October 28, 2014. The intention, as stated in the document, is to conduct performance-based oversight through greater operational awareness of contractor performance by a broader group of Federal personnel. The expectation is to conduct biweekly site visits by members of the EC, with a weekly rotation schedule. An EC Liaison Logbook is handed off to the EC member on rotation to document the site visit and any areas of interest that the next EC member on rotation should observe or follow up on.

A key element of NSTec's CAS is the Performance Metric Dashboard, which is available to all NFO staff and communicates key performance information in specific mission and functional areas, one of which is Work Planning. NFO assigns SMEs to oversee performance, develop an assessment plan, and provide feedback in these functional areas. Each SME assigns a risk score to the functional area based upon several factors. The risk score influences the amount of oversight (e.g., operational awareness, oversight assessments, shadow assessments) for the functional area. The SME develops a functional area summary, which is included in the annual AIP and is used as input to the master assessment schedule.

EA reviewed the 2014 and 2015 AIPs. Both appropriately included a functional area summary for WP&C. The NFO risk rating was "yellow" both years, which was lower than the contractor's self rating of "green". The analysis of the contractor's functional area performance was thorough. In 2014, NFO scheduled one focus area assessment and two shadow assessments. Of these, only one was completed (CS-14-AMSO-206, *Shadow Assessment of IA-14-P510-001, Work Planning and Control*). In 2015, the only scheduled assessment in this area is this EA assessment. The lack of scheduled and completed assessments for a functional area with a risk ranking of yellow does not meet the intent of NFO P 226.X. (See **OFI-NFO-1**.)

NFO O 226.1, *Line Oversight (LO) Program*, describes the field office's oversight processes for operational awareness; developing the AIP; assessment planning, execution, and reporting; issues management; external independent assessments; feedback and improvement; and records. The SMEs are responsible for conducting oversight and providing feedback on performance. During the course of the year, the SMEs provide input on the performance of their functional areas. Each SME provides a quarterly briefing to NFO management. EA reviewed the second quarter 2015 quad charts for the functional areas of Work Planning and Performance Assurance. These appropriately identified significant open issues, oversight activities, and an analysis of risk, performance, and emerging issues.

EA observed a planned operational awareness activity (OAA) in the functional area of Aviation Safety and Aviation Programs conducted by the OAA team of Federal SMEs at RSL-Nellis, and a concurrent NFO EC Liaison field observation. The OAA team provided a brief overview of RSL operations, aircraft maintenance, performance metrics, and pilot scheduling, as well as a quick tour of the RSL-Nellis hanger. The scope of the review was RSL pilot staffing, metrics, and daily operations by the three NFO SMEs. The NSTec Aviation Section Manager (and acting Chief Pilot) was interviewed via telephone since he was located at RSL-Andrews in Maryland. The OAA team systematically went through a binder with all the available metrics. EA noted that information on the Mean Time Between Repair metric was not included in the binder; a software problem prevented it from printing. The OAA team noted that there were no issues during the last review approximately three months earlier. Most of the metrics reviewed were within the established parameters, and trends were generally positive. The OAA team identified a few anomalies which they followed up on and noted the results in their surveillance report, OAA-15-AMSO-TTH-32515, including staying abreast of pilot staffing and short term coverage to maintain

mission readiness until a qualified pilot is hired to replace the RSL Chief Pilot (who separated two weeks before the EA review). The OAA team was knowledgeable and has been effective in identifying issues.

The EC Liaison asked questions during the OAA and followed up on issues documented in the EC Liaison Logbook. The RSL Aviation personnel provided adequate responses to close out the items. The EC field visits provide a positive addition to the operational awareness activities by providing senior leadership visibility in the field.

NFO enters issues in the M&O contractor's issues tracking system, caWeb. A joint NFO/NSTec issues screening team (IST) screens all new issues. However, DOE Order 226.1B requires DOE line management organization to categorize such findings. Per discussions with NFO staff, the IST does not always have a Federal staff presence. (See **OFI-NFO-1**.)

Field elements should conduct formal oversight assessments of the contractor's WP&C programs. These assessments should include evaluation of the contractor's activity level WP&C Program Definition as well as regularly scheduled evaluations of the WP&C Program Implementation. (DOE Guide 226.1-2A)

NFO conducted a set of formal assessments of the WP&C functional area in the 2006-2007 timeframe. Although NFO has conducted formal assessments of programs that included some WP&C elements (e.g., a joint assessment of the NSTec nuclear maintenance management program in March 2015), NFO has not conducted any formal oversight assessments specifically directed at WP&C since then, and none are currently scheduled. (See **OFI-NFO-1**.)

NFO conducted four shadow assessments in the WP&C functional area in FY 2013 and FY 2014. In the shadow assessments, the NFO assessor generally reviewed the team qualifications, assessment plan, final report, and applicable directives. In some cases, the NFO assessor observed portions of the field assessments. In each case, the NFO assessor appropriately documented the shadow assessment, which included a grading sheet and criteria.

Field elements should ensure a comprehensive set of routine operational awareness activities evaluating the effectiveness of contractor WP&C activities is identified, conducted, and documented. (DOE Guide 226.1-2A)

NFO documented 19 operational awareness activities (surveillances) in the primary functional area of work planning in FY 2013 and 36 operational awareness activities in this area in FY 2014.

To date in FY 2015, NFO has not documented any operational awareness activities in the primary functional area of work planning. The FY 2015 AIP functional area summary for work planning stated that NFO oversight in 2015 will "consist of increased operational awareness activity (OAA) by the NFO WP&C, focused on field implementation of the program and using the CRADs provided in Attachment D of the guide." The SME stated that he had participated in OAAs that looked at some aspects of WP&C and were performed by FRs and other SMEs. He also indicated that he had not used the CRADs, since there was no requirement to use CRADs for operational awareness activities. (See **OFI-NFO-1**.)

Each DOE Field Element should have an oversight schedule including activity level WP&C. (DOE Guide 226.1-2A)

Annually, NFO issues an AIP and master assessment schedule that includes the functional area of work planning. Both the FY 2014 and FY 2015 master assessment schedules included the functional area of WP&C.

Each DOE field element should identify WP&C oversight roles and determine who will perform the functions. Field element oversight programs typically include facility representatives and subject matter experts, and may include a lead for WP&C oversight. (DOE Guide 226.1-2A)

NFO O 111.X, *Functions, Responsibilities, and Authorities*, assigns responsibility for site work control practices, the REOP program, the FR program, conduct of operations, and management and performance assurance to the Assistant Manager for Site Operations (AMSO). Within that organization, an SME has been assigned as the lead for the WP&C functional area and the REOP process. The FRs perform operational awareness reviews of AL-WP&C as part of their daily responsibilities.

The AMSO is responsible for coordinating the NFO review and approval of REOPs, but this process is not documented. (See **OFI-NFO-1**.)

DOE field elements should ensure that WP&C oversight results and performance data are analyzed, tracked, and trended by the WP&C lead or other assigned personnel. (DOE Guide 226.1-2A)

The NFO WP&C SME is responsible for analyzing, tracking, and trending WP&C oversight results and performance data, and factoring this information into the assessment planning process and the contractor's annual performance evaluation. The FY 2015 AIP and the quarterly quad charts provide evidence of ongoing analysis of performance data.

DOE Field Element has implemented an effective FR program. (HSS CRAD 45-21)

NFO procedure FRG-01, *Facility Representative Procedure*, provides appropriate guidance and requirements in accordance with DOE-STD-1063-2011, *Facility Representatives*. NFO conducted a tri-annual FR program self-assessment in December 2012 and concluded that the FR program adequately implements all requirements and expectations as prescribed in the standard and local implementation directives. The assessment evaluated the NNSA/NFO FR program and all completed corrective actions from 2009 to December 2012. The assessment was thorough and adequately covered the requirements in FRG-01.

The FRs, SMEs, and safety system oversight (SSO) personnel are highly qualified and must complete formal qualifications within one year of reporting to NFO. The FRs are required to complete qualification cards and satisfactorily complete a written exam and oral boards, in accordance NFO O 426.1, Revision 0, *Technical Qualification Program*. Of the current slate of five FRs, four are fully qualified, and one is interim qualified (90% complete with full qualification).

FRs are based on-site, affording them day-to-day access to contractor and subcontractor activities. Typical activities include reviewing documentation, attending meetings, interviewing personnel, and observing work activities as appropriate to determine the effectiveness of the work control process. NFO completed an FR staffing analysis for FY 2015 in accordance with DOE-STD-1063-2011 and determined that seven FRs were needed to provide oversight at NNSS. Presently, there are five qualified FRs, one of whom has been enrolled in a one-year offsite training course and is not available to perform FR duties. NFO recognized the need to increase FR coverage and on October 2, 2014, issued a memorandum addressing facility-specific compensatory measures. The NFO AMSO is managing shortfalls by assigning personnel who have maintained their FR qualifications to provide oversight at a minimum of 40 hours per quarter, in addition to assigning other staff (e.g., interim qualified FR, SSO, SME) to provide additional oversight on a routine basis. However, 40 hours per quarter is less than 10% of an FTE performing fully qualified FR oversight for certain nuclear facilities. NFO is in the process of hiring additional FR staff. (See **OFI-NFO-1**.)

The FRs and SMEs have been effective in identifying issues. EA observed the FRs at the U1a Complex and the Joint Actinide Shock Physics Experimental Research (JASPER) facility as they conducted oversight of these facilities. The FRs were extremely knowledgeable of their area and interacted with contractor personnel appropriately while reviewing and discussing the work package. The FRs document their operational awareness activities with surveillance reports and prepare a weekly report of all activities.

At U1a, EA attended the pre-job briefing for the work being performed, and observed activity-level work for Work Package 3001457909, *Fabricate and Install Containment Barrier in the 05 and 07 Drift*. The work scope is to fabricate and install Plug #2 (Containment Barrier) in the U1a.05 extension drift. The FR wrote an OAA report (OAA-15-AMSO-JRE-03/25/15) for this observation, which adequately documented the observation and was submitted to management for approval.

At the JASPER facility, the contractor was performing Work Package 3001620145, *Remove Existing 4 Ton A/C Unit and Replace with New Unit*. The work scope is to remove the four-ton air conditioning unit and associated electrical equipment and install a new unit on the existing concrete pad. During work, the FR and EA representative observed the final portion of work, which included removal of LO/TO and initial start of the unit. The FR was extremely knowledgeable of his area and interacted with contractor personnel appropriately while reviewing and discussing the work package.

6.0 CONCLUSIONS

The REOP process provides a framework that generally ensures that work performed on site is appropriately planned, integrated, and controlled. For the most part, the REOP process ensures that work is clearly defined and authorized and that the safety coordination responsibility is assigned to one entity, although the process for ensuring equivalency of secondary REOP holders' processes has not been documented.

In general, NNSS WP&C processes are adequate to ensure that work is planned and conducted and that hazards are appropriately analyzed and controlled. The scope of work for the activities that EA observed was sufficiently defined. Most hazards were analyzed and controls appropriately selected, and (with few exceptions) work was authorized and conducted in a planned, coordinated, and controlled manner and in accordance with written ALWDs and required controls. Managers, supervisors, and operations, craft, and ES&H personnel were experienced and knowledgeable of assigned work activities, and they interacted with each other in a professional manner. Most observed pre-job briefings were thorough, interactive, and tailored to the activities.

EA noted a few concerns among the various reviewed organizations. One sitewide NSTec concern was the lack of WP&C "triggers" to characterize potential beryllium legacy areas in unoccupied buildings before potential dust-disturbing work is performed in those areas. Within JLON, EA observed an overly broad work scope definition for one evolution and a few weaknesses in proper specification and implementation of radiological controls, including vulnerabilities in contamination control, air sampling, and extremity dosimetry. Centerra-Nevada had some problems with following all elements of the Centerra-Nevada work control procedure as written, insufficient IH exposure sampling data in some cases, a REOP in which the laser and explosive hazards were missed, the lack of integration of ES&H SMEs into the REOP review process, and inadequate controls for potential beryllium hazards in unoccupied buildings.

The NSTec assessment process has demonstrated that it can identify weaknesses and drive improvements in WP&C processes. Pending improvements in NSTec's issues management system are designed to increase the effectiveness of the issue management process. The Performance Assurance Division is

restructuring its assessment program from a compliance-based approach to a performance-based approach. EA noted ongoing concerns about issue level categorization and performance indicators.

NFO's oversight processes for AL-WP&C are, for the most part, effective. The suite of procedures adequately defines NFO's assessment and issues management processes, although EA noted that NFO lacks an issues categorization process. The WP&C SME evaluates the contractor's performance in work planning through a review of the CAS and some operational awareness activities. However, NFO has not documented any WP&C OAAs, performed any formal WP&C functional area assessments since 2007, or included any formal WP&C assessments (other than this EA review) in the FY 2015 master assessment schedule. NFO has a well-defined qualification and requirements process for the FRs and SSOs. NFO has the infrastructure in place for an effective FR program, and the FRs, with input from SMEs and SSOs, identify WP&C deficiencies and enter them into the NSTec issue tracking system. Although the current FR staffing shortage has led to inadequate coverage for some facilities, NFO has implemented a stop-gap measure to provide compensatory coverage for the facilities until permanent staff are in place.

7.0 FINDINGS

FIND-NSTec-1: NSTec has not ensured that all NNSS facilities and structures that could be occupied have been adequately characterized for beryllium contamination prior to occupancy as required by 10 CFR 850.20 *Chronic Beryllium Disease Prevention Program.*

8.0 OPPORTUNITIES FOR IMPROVEMENT

The following potential enhancements are not intended to be prescriptive or mandatory. Rather, they 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, opportunities for improvement (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.

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OFI-NSTec-1: Consider increasing emphasis on improving the WP&C process. Specific actions to consider include:

- Establish a date for completing the transition to the planner credentialing program.
- Clarify when a walkdown and/or tabletop is required for the hazard analysis processes in procedures CCD-QA05.001 and CCD-QA-05.001-003.
- Increase emphasis on pre-job briefings with supervisors to ensure that they are complete and comprehensive and that they discuss lessons learned.

OFI -NSTec-2: Consider the timeliness of data used for exposure assessments or negative exposure determinations in support of work planning or preparation of THWPs. Ensure that exposure assessments are updated frequently enough to capture changes in operational activities or materials that could generate hazardous contaminants or conditions.

OFI-NSTec-3: For NNSS buildings and structures that have not been characterized though the NNSS CBDPP, consider either completing characterizations and/or sampling of these building and structures, or providing a work control mechanism that triggers such a review before undertaking any dust-disturbing activities within those buildings or structures. Ensure that all NNSS site workers are informed of the status of building characterization progress, limitations and expectations for when to contact NSTec Industrial Hygiene.

OFI-NSTec-4: Consider investigating why the results of the IH survey on hearing protection for forklift drivers were not appropriately captured in ALWDs or implemented. Also, consider reinforcing the expectation that postings be followed.

OFI-NSTec-5: Consider reevaluating ORPS reporting practices and issuing corporate guidance as necessary to conservatively address near misses. Ensure that guidance and communications address expectations for a reporting culture where managers and workers embrace the concept that recognizing and reporting near miss incidents can significantly improve worker safety and enhance the organization's safety culture.

OFI-NSTec-6: Consider including the roles and responsibilities of the IST in the revision of CCD-QA03.001 *Issues Management*.

OFI-NSTec-7: Consider completing development and implementation of WP&C performance indicators. Ensure that the metrics contain leading indicators, action levels, and an evaluation of the effectiveness of hazard controls, feedback, and corrective actions.

OFI-NSTec-8: Consider improving implementation of radiological controls during RBA work in gloveboxes, hoods, and CAs, as well as during hot breaks where respiratory protection is prescribed. Specific actions to consider include:

- Ensure collection of technical smears to be analyzed real time with a detection sensitivity of less than 20dpm/100 cm^2 alpha during and after work activities to verify that controls were effective in limiting the inadvertent spread of low levels of contamination during work.
- Install automated whole body counters and/or hand and foot counters to improve the detection efficiency of personnel frisking before workers leave operational areas in DAF.
- Modify radiological survey reports to ensure that the specific instrument used to evaluate technical smears and large area wipes are clearly specified, including MDAs applicable to each type of sample.
- Ensure that radiological personnel understand the purpose of job-specific versus fixed air sampling and that the appropriate grab air samples are specified and collected whenever respiratory protection for radionuclides is prescribed during work, consistent with NSTec requirements.

OFI-NSTec-9: Consider using performance observations as an integral part of management assessments.

Centerra-Nevada

OFI-CN-1: Consider reviewing and revising Centerra-Nevada Work Control Procedure P1-07 to meet Centerra-Nevada requirements and expectations for work control, and ensure that workers are trained on the revision.

OFI-CN-2: Consider performing additional sampling for carbon monoxide and airborne metals when firing blank ammunition in DAF designated locations. Based on IH sampling data from the DOE National Training Center for similar blank ammunition, airborne metal sampling should include lead and other airborne metals, in addition to the cadmium and chromium to which the current NNSS sampling has been limited. Similarly, sampling for toxic gases should include nitrous oxides and hydrogen cyanide as well as carbon monoxide.

OFI-CN-3: Consider revising the process for preparing Centerra-Nevada REOPs to ensure that the Centerra-Nevada ES&H SMEs are involved in the development and review of hazards and controls.

Joint Laboratory Office-Nevada

OFI-JLON-1: Consider reviewing the task breakdown presented in REOPs, IWS/IWDs, and RWPs to ensure that they are sufficiently detailed to convey an understanding of the workflow and steps associated with each evolution that may be performed under that task. If not, consider developing subordinate work instructions and/or campaign-specific work scope documents that address the specific work to be performed on a given shift, including specific materials to be handled and the associated hazards and controls.

OFI-JLON-2: Consider reviewing and revising older JNPO RWPs that may lack sufficient specificity on requirements for air sampling and use of workplace indicators when respiratory protection is required as a best management practice during system or container breaches.

OFI-JLON-3: Consider evaluating discrepancies between extremity monitoring practices and the differing RWP requirements for extremity dosimetry that vary from the NSTec and JLON specified dose rate threshold for extremity dosimetry when handling materials with contact dose rates of greater than 50 mrem/hr. If using a dose gradient exemption, ensure this is properly calculated and supported by actual data on sources to be handled. If using a handling time dose exemption, ensure that the RWP places clearly defined limits on time of handling, and track and verify those times.

Nevada Field Office

OFI-NFO-1: Consider increasing emphasis on improving NFO oversight processes, including the WP&C functional area. Specific actions to consider include:

- Develop an NFO issues screening and prioritization process independent of the contractor's process.
- Increase oversight of the WP&C functional area to include a formal oversight assessment of the WP&C program.
- Initiate performance and documentation of operational awareness activities specific to the WP&C functional area.
- Document the review and approval process for REOPs.
- Continue current efforts to recruit and hire FRs to meet the staffing plan and provide the desired oversight.

9.0 ITEMS FOR FOLLOW-UP

During this review, several NvE organizations were implementing organizational changes and other improvements in WP&C that have the potential to improve performance. EA will follow up in future reviews to determine whether these changes are effective in driving improvement.

Appendix A
Supplemental Information

Dates of Review

Onsite Review: March 23-26 and April 13-16, 2015

Office of Enterprise Assessments Management

Glenn S. Podonsky, Director, Office of Enterprise Assessments
William A. Eckroade, Deputy Director, Office of Enterprise Assessments
Thomas R. Staker, Director, Office of Environment, Safety and Health Assessments
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Mario A. Vigliani

Appendix B
Key Documents Reviewed, Interviews, and Observations

Key Documents Reviewed

Centerra-Nevada

Centerra-Nevada Integrated Safety Management System Description Document; CY 2015
Centerra-Nevada ORPS Summary Report
Centerra-Nevada Policy P1-07; Work Control
Centerra-Nevada Security General Order (SGO) 10 – Safety
Centerra-Nevada SPO Training Level 1; Explain/Avoid Beryllium Hazards
Centerra-Nevada Standard Practice SP10-012 Real Estate/Operations Permit (REOP) and DOE Facility Representative Access
Centerra-Nevada Standard Practice SP2-025; Laser Safety Program
REOP No. CNV-0006; 06-CP-41
REOP No. WSI-0004; WSI-Protective Force Training Complex
Risk Analysis Report 07-008; Tactical Maneuver Training
Risk Analysis Report 07-011; Live Fire Activities in Training
Risk Analysis Report 07-012; Dye Marking Cartridge Training
Risk Analysis Report 08-012; Live Shoot Tower
WSI Nevada 2013 Worker Safety and Health Program
WSI-Nevada Industrial Hygiene Health Hazard Evaluations; various health hazard evaluations for the Live Fire Shoot House (2007, 2013); WSI Ammunition Storage Facility (2014); Weapons Firing Training Monitoring at the DAF (2007); Second Weapons Firing Test Carbon Monoxide at the DAF (2007); UTM Study Lead Air Sample Results at the DAF (2014)
WSI-NV Standard Practice SP2-003; Industrial Hygiene Program

NSTec

Activity Level Work Document 3001684786, Installation of Flex Duct
Activity Level Work Document 3001754220, Lead Cleanup and Survey and associated The Toxic Hazard Work Permits (dated 3-24-15 and 3-25-15)
Activity Level Work Document 3001778034, Air Handler PM Inspection
Activity Level Work Document 3001814946, Fan Blower Motor, Glovebox Ventilation Blower Preventative Maintenance
CD-0300.007, Work for Others
CD-G610.017, Work Authorization (Real Estate Operations Permit and Facility Execution Plan)
CD-P280.001 Safety and Industrial Hygiene Manual, section, *general safety rules*
CD-P280.043 Aerial Work Platforms/Lifts
DAF General Employee Training (1DAF0001)
High Hazard Plan of the Day Checklists (completed for NPTEC)
NNSS Accident Investigation Board Report; Chemical Explosion at the Nonproliferation Test and Evaluation Complex (NPTEC) June 13, 2014; August 2014
NPTEC Work Package No. NPTEC-FY2014; General Clean-up
NPTEC Work Package No. NPTEC-FY2015; Excess Property, Materials and Equipment Removal
NSTec Company Directive CCD-QA03.001 *Issue Management*
NSTec Company Directive CCD-QA05.001, NSTec Integrated Work Control Process, R3, 9/16/13
NSTec Company Directive CCD-QA05.001-003, Activity Level Hazard Analysis Process, R3, 9/28/11
NSTec Company Directive CCD-QA05.001-004 Skill of the Worker
NSTec Company Directive CCD-QA05.001-005, Work Package Process, R6, 9/16/13

NSTec Company Directive CCD-QA05.001-006, Technical Procedure Process and Use, R5, 1/15/14
NSTec Company Directive CCD-QA05.001-007, Plan of the Day/Plan of the Week, R3, 11/18/14
NSTec Company Directive CCD-QA05.001-008 Time Out/Stop Work
NSTec Company Directive CCD-QA05.001-009, Pre-Job briefings and Post-Job Debriefings, R1, 2/28/15
NSTec Company Directive CCD-QA05.001-010 Activity Level Work Document Writing Requirements
NSTec Company Directive CCD-QA09.001 *Management Assessment Program*
NSTec Company Directive CCD-QA09.002 *Surveillances*
NSTec Company Directive CCD-QA10.001 *Independent Assessments*
NSTec Company Directive CD-P280.037, Lockout/Tagout
NSTec Company Directive CD-P450.014; Chronic Beryllium Disease Prevention
NSTec Company Directive CD-P450.016; Biological Safety
NSTec Company Directive CD-W200.001 *Joint Assessment Schedule (JAS) Development*
NSTec Company Directive PD-0001.003 *Contractor Assurance System Description*
NSTec Company Directive PD-0001.01 Integrated Safety Management System Description
NSTec Draft Injury/Illness/Incident Report, 2015-024
NSTec JHA for SOP-2151.203, Low-Level Waste Handling and Storage Program, 11/24/2014.
NSTec Lockout/Tagout training materials for Nevada Operations, Course 1E000444, CD-P 280.037
NSTec Management Assessment MA-13-G075 *Work Planning Implementation Assessment*
NSTec Management Assessment MA-13-G075-002 *Skill of the Worker*
NSTec Management Assessment MA-13-G075-003 *POW/POD Compliance*
NSTec Management Assessment MA-13-H000-006 *Environmental Restoration Work Control Implementation*
NSTec Management Assessment MA-14-X150-001 *Activity Level Work Control Processes at RSL Facilities*.
NSTec Power Point presentation on "Results of NFO/NSTec Joint Accident Investigation Addressing June 13, 2014 Drum Explosion at the Nonproliferation Test and Evaluation Complex (NPTEC); August 13, 2014"
NSTec Primary REOP NSTec-0033
NSTec Primary REOP NSTec-0212, RWMC,
NSTec Primary REOP NSTec-0363, U1a Complex,
NSTec Primary REOP NSTec-0125, RSL Nellis Complex
NSTec Procedure OP-T400.001 *Corrective Action Verification*
NSTec Procedure OP-T400.002 *Corrective Action Effectiveness Validation*
NSTec SEP SEP-H200-00, for Environmental Waste Management Operations
NSTec Work Package 3001457909, Fabricate and Install Containment Barrier in the 05 and 07 Drift
NSTec Work Package 3001776402, Fabricate Parts for Lyra Sub-Critical Series Test
NSTec Work Package AAxx-SAL-SAL-0798, Diagnostic and Instrumentation, R4,
Project Screening and Siting Form; Passenger Railcar Chemical and Improvised Explosives Seminar and Test (PRCIEST)
RWMC SOP-2151.203, Low-Level Waste Handling and Storage Program
RWMC SOP-2151.207, Radioactive Waste Management Site Inspections
RWMC SOP-2151.234, Radioactive Waste Operations General Craft Activities
RWMC Structural Ironworker SOTW Training Records and Qualification Card
U1a Diagnostics Technician SOTW Training Records
Work Package EM-14-INL 10-160B Cask Work-0010 R0

JLON

ALWD-CEF-0001 – NCERC Operations
ALWD-DAF-0003 – Glovebox Operations
ALWD-DAF-0017 – LLNL Computed Tomography

ALWD-DAF-007 – TACS Operations
ALWD-DAF-008 – LLNL Nuclear Counterterrorism (NCT) Activities at DAF
CEF-PLA-003 – Safety Plan for NCERC at the DAF
CEF-PLA-006 – Radiation Protection and Contamination Control at NCERC
CEF-PLA-010 – NCERC Subcritical Operations Radiological Control Plan
CEF-SOP-RTO-019 – NCERC Radiation Test Construction Procedure for RTO-019
CTR-PLA-001 – DAF Computed Tomography/Radiography/Staging Safety Plan
GB-PLA-001 – DAF Glovebox Safety Plan
GB-SOP-009 – Glovebox Project Operating Procedure
JLON-0020 – Staging and Glovebox Operations (REOP)
JLON-0053 – NCERC Operations (REOP)
JLON-0054 – LLNL Nuclear Material Operations (REOP)
JLON-0067 0 LLNL Computer Tomography
JLON-PLA-002 – JNPO Safety Management Program (SMP) Plan
JLON-PLA-600 – JLON Safety & Healthy Management Plan
JLON-PLA-601 JLON Radiological Safety Management Plan
JLON-PRO-900 – REOP and Work Control Process
JNPO-PRO-401 *Graded Approach*
JPNO-PRO-501 *JPNO Assessments*
JPNO-PRO-507, *Trend Analysis*
LA14004 – JLON RWP (DAF JLON NCERC Project)
Lab/NSTec Course Equivalencies
LLNL NMO Work Request, Rev 8 – LLNL Nuclear Material Operations
NMO-PLA-001 – Safety Plan for LLNL Nuclear Material Operations at DAF (sent again on 4/13)
NMO-PLA-003 – Radiological Control Plan for the Nuclear Material Operations Project at DAF
PSP-0P-031, R2 - Computed Tomography at DAF
RWP LL14001 – JLON RWP (DAF/NMO)
RWP LL14006 – JLON RWP (DAF)
RWP LL14007 – JLON RWP (DAF/NMO)
RWP LL14008 – JLON RWP (DAF/NMO)
RWP LL14010 – JLON RWP (DAF/NMO)
RWP LL15009 – JLON RWP (DAF/NMO)
RWP LL15021 – DAF

NFO

ASM-AMSO-10.2.2012-469649, Shadow Assessment
ASM-AMSO-10.2.2012-469650, Shadow Assessment
ASM-AMSO-10.2.2012-469651, Shadow Assessment
ASM-AMSP-10.2.2012-469532, NNSA/NFO Tri-annual FR Program Self-Assessment, 12/10/2012
CS-14-AMSO-206, Shadow Assessment
OAA-15-AMSO-CAW-02-11-2015, Maintenance Surveillance
FR Performance Metrics for FY 14 and 1st Quarter FY 15
FR Weekly Reports
Joint Assessment Schedule, Work Control Assessments from 2/24/13 to 2/24/15
Letter from Manager, NFO, dated 10/2/2014, subj: Compensatory Letter – Facility Representative Coverage
Letter to NSTec from Manager, NFO, dated 12/20/2012, subj: REOPs Requiring NNSA NSO Approval
Memo from NFO Manager to Manager, Federal Technical Capability Panel, 1/7/2015, NNSA NFO
Annual Workforce Analysis and Staffing Plan Report
Nevada Field Office Technical Qualification Program Status

NFO FY 2015 Facility Representative staffing analysis
NFO O 226.X, Rev. 1, "Line Oversight (LO) Program"
NFO P 226.X, NNSA NFO Line Oversight System Description Document
NFO procedure, *FRG-01Facility Representative Procedure*
NSO-O-412.X1F, "Real Estate Operations Permit" (REOP)
Surveillance Report Number: OAA-15-AMSO-TTH-32515, Review of RSL Pilot Staffing, Metrics, and Daily Operations
Executive Council Guidance – Field Presence and Customer Liaison, October 28, 2014
Executive Council Field Presence and Customer Liaison Rotation Schedule, March – July 2015

Interviews

NSTec

NPTEC Facility Manager
NPTEC Industrial Hygienist
NSTec Global Security Project Managers
SPE Project Team Managers and Coordinators
NSTec Industrial Hygiene Manager
DAF Maintenance Job Supervisors/Forman
DAF Maintenance Supervisor
DAF Maintenance Superintendent
DAF Radiological Control Supervisor
DAF Radiological Control Technicians
DAF Maintenance Workers
NSTec Performance Assurance Managers
NSTec Industrial Safety Professionals
NSTec Industrial Hygienist
NSTec LOTO SME
NSTec AHJ for Electrical Safety
U1a Diagnostic Technician
U1a Ironworker Foreman
U1a Facility Manager
U1a Engineer
DESS Work Package Coordinator
RWMC Facility Manager
RWMC Work Planner
RWMC Safety Professional
A-1 Machine Shop Manager
A-1 Machine Shop Superintendent Over Craft
A-1 Machine Shop Foreman

Centerra-Nevada

Centerra-Nevada Director, Safety Training & Performance Division
Centerra Nevada Manager ES&H Section
Centerra Nevada Training Academy Manager
Centerra-Nevada Certified Safety Professional
Centerra-Nevada Manager Support Services Section

JLON

JLON, LANL and LLNL managers and staff involved with operations work
JLON and home laboratory health physicists
NSTec DAF Health Physics personnel
NSTec DAF Supervisors
NSTec DAF Nuclear Operations Managers

NFO

Deputy Site Manager
Assistant Manager for Site Operations
WPC SME
Facility Representatives
Occupational Safety SME
Maintenance SME
Former WPC SME
Oversight detailee
Management Systems Group Lead
Aviation Safety Subject Matter Expert

Observations

Review of RSL Pilot Staffing, Metrics, and Daily Operations
Executive Council Operational Awareness Activity – site visit to RSL
JASPER activity level work for WP 3001620145, Remove/Replace 4 Ton A/C Unit

NSTec

NPTEC Plan of the Day and Pre-job Briefings
NPTEC Site General Clean-up and Disposition of Excess Materials and Equipment
Initial walk down of the Passenger Railcar Chemical and Improvised Explosives Seminar and Test (PRCIEST) at Frenchman Flats (NPTEC Site)
Observation of the initial dry run for the Source Physics Experiment (SPE) IV Prime Experiment
Plan of the Day and Pre-Job Briefings for the SPE IV Prime Experiment
DAF Daily Plan of the Day Meetings.
DAF Daily Maintenance Crew Briefings
Work Package 3001814946, Glovebox Ventilation Blower Preventative Maintenance, Pre-Job Briefing, Conduct of Maintenance Activity and Post-Job Review.
Work Package 3001754220, Lead Cleanup and Survey, Pre-Job Brief.
Work Package 3001684786, Installation of Flex Duct, Pre-Job Brief, scaffold and work area inspection by NSTec IS SME.
Work Package 3001684786, Installation of Flex Duct within Contamination Area, under RWP controls.
Work Package 3001778034, Air Handler Unit PM Inspection, Pre-Job Briefing, Conduct of Maintenance Activity.
LOTO evolutions associated with weekly, quarterly and annual air handler PM maintenance
Walkdown of DAF facility, including equipment level, (second floor)
RWMC – Daily pre-start activities and rounds; daily POD meeting; daily Work Planning meeting
RWMC - unloading of a Type A cask; unloading of waste containers
U1a- POD meetings; pre-job briefing
U1a Work Package 3001457909, Fabricate and Install Containment Barrier in the 05 and 07 Drift

Centerra-Nevada

Pro-Force Annual Training & Safety Briefing
Pro-Force Limited Scope Performance Test

JLON

National Criticality Experiments Research Center (NCERC) operations
Nuclear Material Operations associated with the Training Assembly for Criticality Safety (TACS)
Staging and Glovebox Operations
Computed Tomography Operations