

**Office of Enterprise Assessments
Assessment of the Nevada National Security Site
2016 Full-Scale Exercise DORSET-16**



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**Office of Emergency Management Assessments
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Acronyms

AHJ	Authority Having Jurisdiction
C/E	Controller/Evaluator
CAT	Consequence Assessment Team
CRAD	Criteria and Review Approach Document
DM	Duty Manager
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
EAL	Emergency Action Level
EOC	Emergency Operations Center
EPHA	Emergency Planning Hazards Assessment
EPI	Emergency Public Information
EPIP	Emergency Plan Implementing Procedure
ERG	Emergency Response Guidebook
ERO	Emergency Response Organization
HWSU	Hazardous Waste Storage Unit
IC	Incident Commander
ICP	Incident Command Post
IRG	Initial Response Guide
LED	Local Emergency Director
NFO	Nevada Field Office
NFPA	National Fire Protection Association
NLVF	North Las Vegas Facility
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NSF	Nevada Support Facility
NSTec	National Security Technologies, LLC
OCC	Operations Command Center
OE	Operational Emergency
OENRC	Operational Emergency Not Requiring Classification
OFI	Opportunity for Improvement
PA	Protective Action
PAC	Protective Action Criteria
PAO	Public Affairs Officer
PAR	Protective Action Recommendation
RWMC	Radioactive Waste Management Complex
SAE	Site Area Emergency
SFO	Senior Federal Official
UAV	Unmanned Aerial Vehicle
UPS	Uninterruptible Power Supply
VTC	Video Teleconference

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EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) Office of Emergency Management Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the National Nuclear Security Administration (NNSA) Nevada National Security Site (NNSS) full-scale exercise. National Security Technologies, LLC (NSTec), operates NNSS, and the NNSA Nevada Field Office (NFO) provides Federal oversight. EA performed this assessment from February 2 to March 10, 2016.

NSTec designed this full-scale exercise to test and demonstrate the proficiency of selected emergency response capabilities of the NNSS emergency response organization. During this assessment, EA evaluated the conduct of the exercise and evaluation activities to determine whether the exercise program validates emergency management program elements by initiating responses to a simulated, realistic emergency exercise. This assessment also reviewed key exercise program elements (plans and procedures and training, drills, and exercises) directly related to performance deficiencies noted during the exercise. Finally, EA followed up on findings identified in the *Independent Oversight Review of Preparedness for Severe Natural Phenomena Events at the NNSS*, dated February 2014.

A full-scale exercise is the most complex of the operations-based exercises, focusing on implementing, analyzing, and evaluating plans, policies and procedures. NSTec effectively conducted this exercise in accordance with DOE requirements, and EA evaluated the performance of the emergency response organization at the operations command center, incident command post, facility command post, emergency operations centers (EOCs), and consequence assessment team room. During the exercise, the operations command center staff verified classification of the emergency, activated the EOC and first responders, and informed the site and offsite authorities of event conditions and protective actions. The incident commander quickly developed an overall incident action plan, developed proper contingency actions, and maintained reliable, continuous, effective, and accurate communication among the emergency response organization throughout the exercise. The local emergency director maintained personnel accountability, successfully integrated into the unified incident command, and appropriately evacuated non-essential personnel. The EOC cadre adequately supported the incident commander, maintained communications with offsite organizations, and made follow-up notifications. The consequence assessment team effectively provided accurate and timely initial assessments and ongoing continuous assessments.

EA also noted two best practices during the exercise. NSTec used the risk communication team from Argonne National Laboratory to develop a mock newscast, allowing exercise participants to participate in a realistic press conference. Additionally, the operations command center team, presented with the complex problem of maintaining a clear understanding between real world and exercise events, addressed the situation by stating “exercise message” or “real world message” before each communication. This allowed the team to effectively respond to real world events during the exercise.

Although the exercise plan included activation and operation of the EOC, the scope of this exercise required minimal involvement of the EOC cadre. Also by design and contrary to the concept of a full-scale exercise, this exercise involved minimal participation by offsite agencies and the EOC consequence assessment team; had no simulated radiological or hazardous material release necessitating offsite protective action recommendations or onsite protective actions; and involved no injured personnel. EA also noted several weaknesses in emergency response organization performance. The operations

command center staff did not make timely, accurate, and complete offsite emergency notifications. The local emergency director did not categorize one emergency event correctly and did not classify the other event in a timely manner. The EOC cadre did not fully use available tools and resources necessary for effective command, control, and communications, which are critical functions in maintaining situational awareness and a common operating picture throughout the emergency response organization.

Additionally, the follow-on programmatic assessment determined that NSTec and NFO have a number of weaknesses in their implementing documentation, including a lack of guidance for the EOC cadre for effectively using tools and resources to improve situational awareness; inconsistencies in the Senior Federal Official duties and authorities; and ambiguous predetermined protective actions. Exercise conduct processes did not prevent exercise controllers, evaluators, and an observer from injecting an unplanned and unrealistic simulation into exercise play; providing players with unearned information; and prompting three players to perform tasks during the exercise. The exercise planning process also did not result in an exercise plan that guided the emergency response organization towards the desired response or a sufficient set of exercise objectives to evaluate the expected performance.

The follow-up to EA's 2014 assessment determined that NSTec appropriately entered the four 2014 EA findings into its corrective action system, and the corrective actions for one finding effectively resolved the issue. However, NSTec closed two of the findings, and NFO and the North Las Vegas support service contractor, Alutiiq-Pacific, LLC closed another finding without resolving the original issues. Significantly, NFO and NSTec did not resolve how to provide information needed by state and county emergency management organizations to effectively respond to NNSS emergencies with offsite consequences. Additionally, the Nevada Support Facility (which houses an EOC) backup power system for emergency egress lighting does not fully comply with National Fire Protection Association codes and standards.

Ultimately, the limited scope of this full-scale exercise was a missed opportunity for NSTec and NFO to implement, analyze, and evaluate response plans and procedures for improving the emergency management program. NSTec has the guidance necessary for good exercise design, conduct, and evaluation. However, limitations in the exercise scenario lessened NSTec's effectiveness to fully evaluate and validate response plans and procedures.

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1.0 PURPOSE

The U.S. Department of Energy (DOE) Office of Emergency Management Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the preparedness of National Security Technologies, LLC (NSTec), and the National Nuclear Security Administration (NNSA) Nevada Field Office (NFO) emergency response organization (ERO) to respond to a simulated Operational Emergency (OE) in accordance with the site's emergency plans and procedures and DOE Order 151.1C, *Comprehensive Emergency Management System*. EA performed this assessment at the Nevada National Security Site (NNSS) from February 2 to March 10, 2016.

2.0 SCOPE

This assessment evaluated the preparedness of NSTec and NFO to respond to an OE and conduct an emergency management exercise. Based on observations made during the exercise, EA also conducted a targeted assessment of selected aspects of the emergency management program elements that support personnel performance (plans and procedures and training, drills, and exercises). Finally, EA reviewed the closure of four findings from the 2014 EA report of the NNSS emergency management program.

3.0 BACKGROUND

NNSS is located in Nye County, Nevada, and encompasses a 1,375 square mile area located 65 miles northwest of Las Vegas, Nevada. The U.S. Air Force controls land and air space use through a Memorandum of Understanding between DOE and the U.S. Air Force that excludes public use or access. Access to and from NNSS is tightly controlled, restricted, and guarded on a 24-hour basis.

NNSS supports the NNSA/NFO waste management activities and national security-related research, development, and testing programs. The NNSA/NFO is responsible for the Federal oversight of the NNSS. NSTec is the management and operations contractor for NNSS and affiliated facilities.

4.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*. EA implements the independent oversight program through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. Organizations and programs within DOE use varying terms to document specific assessment results. In this report, EA uses the terms "deficiencies, findings, and opportunities for improvement (OFIs)" as defined in DOE Order 227.1A. In accordance with DOE Order 227.1A, DOE line management and/or contractor organizations must develop and implement corrective action plans for the deficiencies identified as findings. Other important deficiencies not meeting the criteria for a finding are also highlighted in the report and summarized in Appendix C. These deficiencies should be addressed consistent with site-specific issues management procedures.

As identified in the EA assessment plan, EA used portions of Criteria and Review Approach Document (CRAD) 45-61, *Exercise Program Review and Severe Event Response Evaluation*, applicable to this exercise evaluation. EA's independent evaluators assessed the response to, and conduct of, the exercise scenario using the DORSET-16 exercise package, exercise evaluation guidelines, and various other response tools developed by NSTec. This assessment also reviewed selected aspects of the emergency management program related to performance deficiencies noted during the exercise. This programmatic review examined key documents, such as plans, procedures, and manuals, and numerous other documents. EA also conducted interviews of key personnel involved in the exercise or responsible for developing and executing relevant program elements.

EA had conducted a previous assessment of the NNSC emergency management program in September–October 2013; the results were provided in a report entitled *Independent Oversight Review of Preparedness for Severe Natural Phenomena Events at the NNSC*, dated February 2014, and this 2016 assessment examined the completion and effectiveness of corrective actions from the findings described in the 2104 report of the NNSC emergency management program. Results of this review are included in Section 5.2.

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

5.0 RESULTS

Section 5.1 documents the results of EA's observations at the evaluated venues (operations command center [OCC], incident command post [ICP], facility command post, emergency operations centers [EOCs], and consequence assessment team [CAT] room) and the overall conduct of the exercise. Based on these observations, EA targeted components of plans and procedures; training, drills, and exercises; and readiness assurance (corrective actions) elements for further analysis and assessment. These results are documented in Section 5.2.

5.1 Exercise Evaluation

Criterion:

An exercise validates elements of an emergency management program by initiating a response to simulated, realistic emergency events/conditions in a manner that, as nearly as possible, replicates an integrated emergency response to an actual event. Planning and preparation use an effective, structured approach that includes documentation of specific objectives, scope, time lines, injects, controller instructions, and evaluation criteria for realistic scenarios. Exercises are conducted, controlled, evaluated, and critiqued effectively and reliably and result in lessons learned, corrective actions, and program improvements for identified program weaknesses. (Paraphrased from CRAD 45-61, Exercise Program Review and Severe Event Response Evaluation)

EA's observations of the DORSET-16 exercise at the NNSC provide the basis for this section. The initiating event for the exercise consisted of several severe weather systems that moved over the site throughout the preceding 24 hours. This weather led to an accumulation of approximately one to two inches of rain, saturating the ground. Additional torrential downpours caused road shifting, soil sloughing, and material instability at the hazardous waste storage unit (HWSU) and radioactive waste management complex (RWMC) facilities in Area 5.

Exercise play began when the waste specialist inspection of the HWSU hazardous material pad identified that the accumulation of water had eroded the concrete pad, resulting in the displacement of two metal drums from the flammable waste section into the corrosive waste section. The drums were no longer upright and were resting against other stored items, causing further instability.

Simultaneously, the RWMC facility manager dispatched a work crew to evaluate the active waste disposal cells. Upon arrival, the work crew saw continued soil sloughing at a considerable rate, gross erosion of the cell floor, pooling of water throughout the area that was mainly concentrated at the base of the perimeter of stacked materials, and some possible shifting of material. The crew noted a strong water flow moving between two waste disposal cells with deep crevices at the corners of both cells. Rushing water forced a truck containing two members of the work crew off the road, leaving them trapped inside the truck.

Operations Command Center

At the start of the exercise, NSTec adequately staffed the OCC with a qualified OCC duty manager (DM), an OCC operations support specialist, two Fire and Rescue dispatchers, an air and ground operations support specialist, and a protective force liaison. The OCC and the onsite EOC share the same building in Mercury, the main onsite administrative area, adjacent to one another. NSTec personnel continuously staffed the OCC to monitor site conditions and activities and made notifications to personnel at impacted facilities and to offsite authorities during the exercise.

The OCC staff effectively used procedures, checklists, and equipment; the OCC DM appropriately delegated response tasks to the other OCC support staff to complete the DOE required offsite notifications, including initial and update notifications, and notifications to onsite workers outside of the facility boundary. In addition, the OCC maintained excellent differentiation between actual activities and exercise responses, clearly communicating all actual activities. The OCC also collected personnel accountability information and status updates from the local emergency director (LED) and relayed the information to the EOC, once activated. The air and ground operations support specialist followed the protocol for acquiring help from the U.S. Air Force for an unmanned aerial vehicle (UAV); however, the simulation was not appropriate for the exercise meteorological conditions (see the Conduct of Exercise subsection for further details).

The LED called the OCC DM to report the HWSU incident categorization, initially reporting it as an Operational Emergency Not Requiring Classification (OENRC) with a protective action (PA) distance of 100 meters in all directions. However, the OCC DM did not agree with the OENRC rationale presented by the LED and said that the LED must have a specific emergency action level (EAL) identification number for the OCC DM to concur on the categorization. An 8-minute discussion on the use of Initial Response Guide (IRG)-2120.002, *Nevada National Security Site Initial Response Guide*, which contains the EALs, did not result in a decision and the OCC DM asked the LED to review the RWMC event and call back with a categorization and classification for the RWMC conditions. The LED returned the call with a classification determination of Site Area Emergency (SAE) for the RWMC event, which the OCC DM verified as correct, and the LED determined that the HWSU event did not require categorization.

The OCC did not accomplish all actions required by OP-2120.078, *Operations Command Center Standard Operations*, including the completion of all required notifications to DOE and NNSA Headquarters and offsite agencies within 15 minutes of the SAE declaration. The OCC sent the initial NFO-149, *NNSA/NFO Emergency Notification Form*, via email to offsite agencies and via fax to the State of Nevada 22 minutes after event classification. The OCC confirmed receipt of the NFO-149 with offsite agencies between 25 to 40 minutes after the event classification, at least 10 minutes beyond the 15-minute requirement from DOE Order 151.1C (**Deficiency** and see **OFI-NSTec-1**).

In addition, the approved NFO-149 forms (initial and updated) contained some contradictory or erroneous information (see **OFI-NSTec-1**). For example:

- The updated NFO-149 form stated the conflicting prognosis that the situation was both unknown and stable.
- The updated NFO-149 form indicated the classification status as the initial classification rather than as an information update.
- Both the initial and updated NFO-149 forms incorrectly recorded wind speed in knots rather than in meters per second, which could result in offsite organizations using incorrect data when confirming the site's airborne concentration calculations and plume arrival times.

Overall, the OCC staff demonstrated good recognition of emergency events; used their procedures, checklists, and equipment; accurately verified classification of the RWMC event; activated the EOC and first responders; and informed the site and offsite authorities of event conditions and PAs. However, the OCC staff lacked proficiency in performing timely, accurate, and complete notifications. Additionally, EA observed proficiency issues in the use of IRG-2120.002 and associated EALs related to the HWSU event.

Incident Command Post

At the start of the exercise, the fire department deployed resources to the RWMC and established a safe operating location for the ICP in the RWMC office building conference room. This ICP provided a central location that was an adequate distance from the two incident scenes. The central location allowed viewing of both event scenes and was easily identifiable to any arriving resources. The senior fire department officer commenced an appropriate initial response to the emergency by assigning an event scene safety officer and dispatching resources to the truck stuck in floodwaters with two trapped occupants near the RWMC waste disposal cells.

The senior fire department officer assumed the role of incident commander (IC) and quickly established a unified incident command that included the LED and support personnel from radiological control, the protective force, and local law enforcement. An industrial hygienist subsequently joined the IC staff to assist with the incident at the HWSU. Further, the IC clearly established command and control of the on-scene emergency response and the IC worked collaboratively with the ICP staff to evaluate the two events. The IC also ensured the availability of the truck occupants for questioning by local law enforcement regarding the vehicle accident, once rescued and surveyed by radiological control.

The IC adequately assessed the magnitude and safety concerns associated with two incidents. Throughout the emergency, the IC effectively ensured the safety of field emergency responders. The IC developed, implemented, and tracked an appropriate incident action plan as required by OP-2120.049, *Incident Command System*. The IC also appropriately assessed and prioritized the emergency response activities and established the top priorities as removing endangered occupants from the truck and treating any potential injuries. Further, the IC appropriately coordinated internal and external response assets, including a UAV that provided overhead imagery of the two event scenes. To confirm that none of the HWSU drums were leaking, the IC and industrial hygienist used binoculars to verify that the drums were intact with no visible signs of leakage. In addition, the IC reviewed the U.S. Department of Transportation *Emergency Response Guidebook* (ERG) to determine the required PAs if the situation at the HWSU deteriorated. The IC determined the greatest hazard was a large spill of the waste fuel with an

initial downwind evacuation distance of 1,000 feet. Based on this information plus the weather conditions and input from the ICP industrial hygiene representative, the IC appropriately chose not to attempt an entry into the HWSU because the situation posed no immediate hazard.

The IC maintained reliable, continuous, effective, and accurate communication among the field emergency responders, OCC, and EOC throughout the exercise. In addition, the IC and LED shared information frequently to ensure that they were aware of each other's actions. The IC also participated, along with the LED, in conference calls with the EOC over a speaker phone. Locating the ICP in the RWMC office building conference room further enhanced the available communication options by adding landline telephones and an Internet connection (with access to WebEOC) in addition to the radios and cell phones already in use.

Overall, the fire department established a safe operating location for the ICP and began an appropriate initial response to the emergency. The senior fire department officer assumed incident command, quickly established a unified incident command, prioritized the response actions, and developed an overall incident action plan. Further, the IC appropriately coordinated internal and external response assets and developed proper contingency actions if the situation were to deteriorate. In addition, the IC maintained reliable, continuous, effective, and accurate communication among the field emergency responders, OCC, and EOC throughout the exercise.

Facility Command Post

At the start of the exercise, the HWSU and RWMC LED established a facility command post in the main office building consistent with the requirements of NFO-EOC-PLN-101, *Consolidated Emergency Management Plan*. A cadre of three support LEDs and two staff members assisted the LED in the facility command post; a radiological control supervisor, radiological control technicians, and the emergency action team also supported the LED on site.

The LED successfully supported many aspects of the emergency response. The facility command post provided adequate equipment and tools for communications and recordkeeping. The LED and support cadre accurately recorded event information and personnel accountability on local status boards to maintain situational awareness. Further, a support LED completed the LED position specific checklist, including notifying the OCC DM regarding personnel accountability. In addition, the LED established and maintained effective communications with the OCC DM, IC, and the EOC throughout the response. The LED also provided a comprehensive briefing of important information to the IC upon the IC's arrival. In response to the flooding and potentially impassible NNSS site roads, the LED, working within the unified incident command, successfully evacuated non-essential facility personnel. RWMC personnel safely and successfully completed the evacuation, including confirmation of full accountability upon relocation to the Mercury cafeteria.

The LED did not correctly declare the HWSU event as an OENRC. The LED and support staff had difficulty using IRG-2120.002, initially referencing the facility section for the Area 5 RWMC instead of the HWSU facility. The LED appropriately used the HWSU storage pad hazardous waste inventory record and the ERG to determine that the storage pad had no extremely hazardous materials (known as green highlighted materials) and, therefore, would not result in a classifiable emergency per IRG-2120.002. The LED and OCC DM discussed the possible categories for an OENRC that applied to the HWSU conditions and could not agree on an EAL. Even though the LED wanted to categorize the HWSU event as an OENRC, the LED did not have an EAL to support his supervisory judgement in the HWSU set of EALs. The LED concluded that the event was not an OENRC 25 minutes after discovery. However, DOE Order 151.1C requires event categorization no later than 15 minutes after event discovery. As a result, the LED did not achieve the intent to categorize the event as an OE and to activate

the ERO. The existing NSTec criteria available for determining quickly whether an event is an OE are not effective as required by DOE Order 151.1C (see the Plans and Procedures subsection in Section 5.2 for further discussion and **OFI-NSTec-2**).

For the RWMC event, the LED accurately classified the event as an SAE, but the classification was not timely. Approximately 15 minutes after receiving the report from the HWSU, the LED learned that two workers were trapped in a truck with rising floodwaters and that conditions were deteriorating in the RWMC disposal cells. This included cell wall erosion and flooding, putting the waste containers at risk of rupture. The LED used IRG-2120.002 to correctly classify the event as an SAE based on the potential for a release of radiological material. The time from discovery to classification was 18 minutes; slightly greater than required by DOE Order 151.1C.

The LED also did not follow the required preplanned PA listed in the EAL for the RWMC emergency. The SAE EAL section of the IRG PA guide states, “Evacuation of the immediate affected area and shelter in place in a nearby facility.” IRG-2120.002 does not define the terms “immediate affected area” or “a nearby facility.” The LED instructed workers to remain indoors in nearby facilities, but not to shelter in place. The IRG-2120.002 EAL for this specific RWMC emergency states that the protective action criteria (PAC) distance is 0.26 km. All nearby facilities are located beyond 0.26 km from the event scene. However, NSTec does not define the relationship between the PAC distance and the PA guide. Consequently, NSTec did not establish consistent and detailed preplanned PAs for onsite personnel in accordance with DOE Order 151.1C (see the Plans and Procedures subsection in Section 5.2 for further discussion).

Overall, the LED responded appropriately to changing information and the support cadre worked efficiently as a team. They used position specific checklists, sustained good communications across the ERO, maintained personnel accountability, and successfully integrated into the unified incident command. The LED also appropriately evacuated non-essential facility personnel because of deteriorating road conditions. Nevertheless, the LED did not categorize the HWSU event correctly as an OE and did not classify the RWMC event in a timely manner. The absence of a useable EAL for declaring a supervisory judgement OE and lack of familiarity with IRG-2120.002 contributed to these outcomes. In addition, IRG-2120.002 did not provide clear instructions on the preplanned PAs for the RWMC SAE event.

Emergency Operations Center, Mercury and North Las Vegas

The EOC comprises one organization that simultaneously operates in two locations: one at the North Las Vegas Facility (NLVF) and one in Mercury at the NNSS. Both locations are dedicated facilities and serve as an alternate to one another. The centers work as a cohesive unit with a single mission of responding to and supporting emergencies at NNSA/NFO locations. Most notably, using a video teleconference (VTC) bridge, the EOC cadre is able to report to either location and perform their specific roles and responsibilities. Since this reduces the travel time for the EOC cadre, they are able to staff the EOC quickly and either EOC can support a response.

At the start of the exercise, the EOCs at both locations were vacant and then quickly staffed once the OCC DM activated the ERO for the SAE declaration. Within four minutes of activation, the emergency management advisor arrived and received a briefing from the OCC DM. The EOC cadre achieved minimum staffing, support unit staff established the EOC VTC bridge (although the NNSS EOC support unit player could not establish the bridge until helped by a controller/evaluator [C/E]), and the emergency manager declared the EOC operational 28 minutes after activation. In addition, the public affairs officer (PAO) issued the first press release within the required hour of ERO activation; the EOC offsite liaison initiated contact with offsite organizations; and the operations group lead established communications

with the LED. Further, after the OCC DM issued the second NFO-149 form, the EOC planning group lead took responsibility for the third and future NFO-149 forms. Furthermore, the EOC held regularly scheduled meet-me-calls, maintained the situational awareness board, appropriately supported the IC and LED, interacted with offsite interfaces, and provided timely press releases. Finally, several EOC teams maintained effective internal communication throughout the event.

However, EA noted some communications weaknesses related to situational awareness and record keeping among the EOC cadre:

- The EOC cadre made minimal entries on the WebEOC significant event, position log, and mission/tasks assignment boards and did not capture or share the results of the verbal discussions and decisions; subsequently, the emergency manager did not tell the NNSC EOC and IC that the EOC was operational until the end of the first joint NNSC-NLVF EOC briefing.
- The Fire and Rescue representative received maps and inventory information from the IC assistant, but delayed sharing the information on WebEOC, as a result, the information took 2 hours and 15 minutes to reach the CAT so they could then complete their assessment.
- The EOC cadre displayed only the image of the other EOC and the situational awareness board (which was delayed and had errors) on the video walls, despite the capability of the system to show multiple status boards and position logs on selected wall mounted or video wall displays (NLVF – seven displays and NNSC – ten displays), consequently, some members of the EOC did not share a common operating picture.

Collectively, the EOC cadre did not provide for an accurate and complete chronology of activities and did not provide for continuing effective communication among the response organizations throughout the emergency as required by DOE Order 151.1C (**Deficiency** and see **OFI-NSTec-3**).

The EOC PAO performed the duties described in NSTec procedures using the PAO checklist. The pre-approved initial news release was released within one hour of the declaration of the event. The PAO then distributed all subsequent public information, which was accurate and timely, via social media. Additionally, as a best practice, the exercise used the risk communication team from Argonne National Laboratory, which developed mock newscasts and narrative videos to provide players with a more realistic decision-making environment, including a mock press conference.

However, EA noted some weaknesses in documentation and approval authorities for emergency public information (EPI). Some WebEOC boards and news releases either omitted the date and time or did not specify whether the time represented issuance of a draft, approval for release, or actual release to the media. Also, not all tweets were approved prior to release as required by procedure. Further, the NNSC/NFO EPI Program Manual does not adequately identify who approves public releases. Finally, DOE Order 151.1C states each cognizant field element must prepare an EPI plan that includes identification of personnel to provide EPI, and to train and exercise them. However, a senior NFO official did not participate in the mock press conference, and NFO/NSTec have not designated public spokespersons for NNSC (see **OFI-NSTec-4**).

During the exercise, the NFO SFO conducted his duties as specified in his checklist, participated in and contributed to EOC discussions, approved social media releases as required, and communicated with the DOE and NNSC Headquarters Operations Center. However, EA noted inconsistencies in the authorities and responsibilities assigned to the SFO as follows (**Deficiencies** and see **OFI-NFO-1**):

- NFO plans do not specify the decision-making authorities and responsibilities of the SFO as required by DOE Order 151.1C.
- NFO did not clearly specify in writing the delegation of specific authorities from the NFO site manager to the SFO as required by NFO Order 111.X, *U.S. Department of Energy National Nuclear Security Administration Nevada Field Office Functions, Responsibilities, and Authorities*.
- The SFO checklist does not specify for the SFO to oversee the facility/site response or coordinate the tactical response to the event with tribal, state, and local governments, as required by DOE Order 151.1C.

Overall, the EOC cadre adequately demonstrated many significant functions during the exercise, such as supporting the IC, maintaining communications with offsite organizations, and making follow-up notifications. In addition, several EOC teams maintained effective internal communication throughout the event. Nevertheless, the EOC cadre did not fully use available tools and resources necessary for effective command, control, and communications, which are critical functions in maintaining situational awareness and a common operating picture throughout the EOC. In addition, the EOC cadre did not properly document the event to provide a clear and complete chronology of activities. Further, NFO has not designated a public spokesperson for NNSS. Lastly, EA identified discrepancies in the supporting documentation and formal authority delegation related to the SFO position.

Consequence Assessment Team Room

The CAT provided an accurate and timely initial assessment of the SAE at the RWMC. The CAT, composed of a two-person team, arrived quickly after ERO activation at their workstation within the Nevada Support Facility (NSF), started using their checklist, and immediately retrieved the NFO-149 form from WebEOC to gather initial event information for use in conducting an initial consequence assessment. The CAT completed the initial assessment by:

- Reviewing IRG-2120.002 and the selected EAL to verify proper event classification and PA distances
- Reviewing the emergency planning hazards assessment (EPHA) to identify the analyzed scenario for the selected EAL and exposures at receptors of interest
- Determining the actual source term information through a phone call to the OCC DM
- Developing an initial plume plot using the Hotspot dispersion modeling program.

The OCC DM told the CAT that no hazardous material release occurred, so the CAT obtained the entire inventory reported by the LED for the waste disposal cell and analyzed the potential impact from a release of twice that amount of radiological material using the exercise meteorological data. The CAT used the Hotspot model to confirm that the one rem PAC is not exceeded if the release includes the entire active disposal cell inventory. The CAT informed the EOC cadre of the consequence assessment results by telephone, and a planning group member and the CAT agreed to not post the plume results in WebEOC because there had been no release and airborne concentrations would remain below PAC if a release occurred. Furthermore, the CAT was aware that, if a release occurred later, the meteorological data used for the plume results would be out of date.

The CAT accurately assessed the conditions reported at the HWSU, but there was a significant delay in CAT receiving the information, which was also incomplete. Approximately 2 hours and 15 minutes after the LED learned that a shift in drums occurred at the HWSU, the CAT first heard of this information during a VTC bridge line discussion with ERO members. The CAT learned that the drums contained arsenic, sulfuric acid, and “jet diesel fuel”; that the inventory did not contain extremely hazardous material; and that no release had occurred. The CAT reviewed IRG-2120.002, the ERG, and the DOE PAC database to confirm that the reported chemicals were not hazardous material under DOE Order 151.1C criteria. However, no one told the CAT that the inventory also included a drum of waste aerosol, although insignificant because the waste aerosol did not meet hazardous material criteria. For additional confirmation, the CAT used the EPICode dispersion modeling program to model the release of the entire fuel inventory and the results indicated that a release would not exceed the PAC.

The CAT performed adequate ongoing continuous assessments. As part of this process, the CAT posted periodic weather updates in WebEOC, monitored weather forecasts, anticipated performing additional dispersion modeling if a release occurred, participated in ERO conference calls, and telephoned individual ERO personnel to share information.

Overall, the CAT effectively provided accurate and timely initial assessments, adequate ongoing continuous assessments, and kept the ERO adequately informed of consequence assessment results in accordance with site procedures.

Conduct of Exercise

NSTec conducted the full-scale exercise in a manner that enabled the exercise evaluators to validate elements of the NNS emergency management program by initiating a response to simulated, realistic emergency events/conditions that closely replicated an integrated emergency response to an actual event. In addition, NSTec used a comprehensive simulation center staffed with experienced and knowledgeable controllers to portray the agencies and individuals who would likely participate during a real event. The simulation center generated injects based on player requests, received player responses, and delivered information to represent actions, activities, and conversations with individuals who were not participating.

NSTec provided venue exercise C/Es, controllers in the simulation center, and observers with exercise-specific training, rules of conduct, and guidelines on interactions with players. Venue C/Es executed the exercise package as designed, and NSTec held a hotwash at each venue immediately after the exercise to gather and document the participants’ observations. NSTec also conducted a follow-on C/E debrief to determine whether the players accomplished the individual exercise objectives, based on a synthesis of the observations and information gathered during the conduct of the exercise.

EA noted a best practice in the OCC. The OCC team, presented with the complex problem of maintaining a clear understanding between real world and exercise events, addressed the situation by stating “exercise message” or “real world message” before each communication. This enabled the OCC team to effectively respond to real world events during the exercise.

Although NSTec conducted the full-scale exercise in accordance with most DOE requirements, EA identified the following issues in exercise planning, control, and evaluation:

- Discussed further in the Section 5.2, the exercise plan did not test the revised OENRC EAL, as the plan did not guide the ERO to the desired response (i.e., categorization of the HWSU event as OENRC).

- The exercise plan did not contain enough exercise objectives to evaluate the players' expected actions, discussed further in Section 5.2.
- Despite being a full-scale exercise, the exercise did not provide an opportunity to implement, analyze, and evaluate plans, policies, and procedures; rather, the exercise included:
 - Minimal participation from offsite agencies.
 - Minimal activities for the EOC cadre and CAT.
 - No simulated radiological or hazardous material release requiring onsite PAs or offsite protective action recommendations (PARs).
 - No injured personnel.
- C/Es provided players with unearned information, specifically:
 - Before the exercise started, a C/E inappropriately provided the OCC team with photos of the flooded RWMC cell and sloughing soil conditions, as well as a schematic of the RWMC that identified the vehicle accident location; consequently, the players did not use their normal communication channels to get this information.
 - A C/E provided the IC with the HWSU inventory from the exercise package when the IC asked what he could see using binoculars; as a result, the IC discovered a discrepancy regarding the LED's HWSU inventory before the players were able to resolve the inventory discrepancy through their own actions.
- C/Es and an observer inappropriately prompted players to perform tasks, specifically:
 - A C/E told the OCC DM to call the LED when the OCC DM asked whether she should contact the LED after 15 minutes had elapsed since event recognition/discovery without a categorization and classification of the simulated emergencies, inappropriately influencing the timing of the categorization and classification decision.
 - A C/E helped the NNSS EOC support unit player turn on the EOC VTC when the player had difficulty operating the equipment, rather than allowing the player to request help from other players.
 - An NNSS EOC observer directed a player to reposition the WebEOC situational awareness board for greater visibility within the NNSS EOC, rather than allowing the players to determine how they wished to view the board.
- A controller injected an unplanned and unrealistic simulation when a player asked for and received support from a UAV without the senior controller's approval as required. In this case, aerial support gave players information on the extent of the emergency that they would have had to learn using alternate methods. NSTec did not discuss UAV support in the exercise plan, and the simulated weather conditions (heavy rain and low clouds) would have prevented its use.

- NSTec assigned most personnel the dual roles of evaluators and controllers, which DOE’s emergency management guidelines discourage because each role has specific responsibilities that require total concentration to be performed effectively.
- NSTec did not capture most of the previously mentioned issues in its post-exercise debrief with the C/Es, partly because of the dual assignment as C/Es.

Collectively, these examples indicate that NSTec did not effectively plan, control, and evaluate the exercise as required by DOE Order 151.1C (**Deficiency** and see **OFI-NSTec-5** and **OFI-NSTec-6**).

Overall, NSTec conducted an exercise in accordance with DOE requirements, but deviated from some DOE guidelines in its planning, control, and evaluation of the exercise. EA also identified a few areas, such as the thoroughness of exercise planning and evaluation and appropriately interacting with players, where NSTec could further improve the NNSC exercise program.

5.2 Program Assessment

In addition to evaluating exercise performance and assessing the effectiveness and implementation of the emergency management exercise program established by NSTec, this assessment reviewed selected aspects of the emergency management program elements directly related to performance deficiencies noted during the exercise. These elements are plans and procedures and training, drills, and exercises. EA also followed up on the NNSC findings documented in the *Independent Oversight Review of Preparedness for Severe Natural Phenomena Events at the NNSC*, dated February 2014.

Plans and Procedures

Criterion:

Specific, comprehensive implementing procedures must be developed in conformance with the documented program, and these implementing procedures must be usable by the personnel responsible for their implementation. (Paraphrased from DOE Order 151.1C, Comprehensive Emergency Management System)

As discussed in Section 5.1, EA noted issues with inadequate communications among the EOC cadre that were partly a result of EOC cadre members not using available tools and resources within the EOC. NSTec does not describe all available EOC tools and resources in the emergency plan implementing procedures (EPIPs). NSTec also noted this issue and the need for additional guidance for the EOC cadre on tools and resources (see **OFI-NSTec-3**).

EA also identified weaknesses with the players’ use of IRG-2120.002 during the exercise (discussed in detail in Section 5.1). NSTec does not define the terms “immediate affected area” or “a nearby facility.” When the LED applied IRG-2120.002 at the RWMC, the LED did not implement the shelter-in-place PA because IRG-2120.002 does not provide specific instructions for the facilities that are nearby the RWMC, possibly resulting in inadequate protection of collocated workers. Consequently, NSTec does not establish preplanned PAs for onsite personnel in accordance with DOE Order 151.1C (see **OFI-NSTec-7**).

Also, as discussed in Section 5.1, the LED did not have an EAL available to declare an OENRC for the HWSU event and activate the site-level ERO. The event at the HWSU met the definition of an OE and the LED initially requested the OCC DM to activate the ERO, although IRG-2120.002 has no EAL to permit activation of the ERO for this event. Upon investigation, EA determined that NSTec revised IRG-

2120.001, *Nevada National Security Site Initial Response Guide*, changing the indicators for the supervisory judgement OENRC EAL SJ-1 from indicators that adequately captured the HWSU OENRC event to indicators for a classifiable emergency similar to a General Emergency classification. Consequently, NSTec lacks specific EALs for the spectrum of potential OEs identified by the EPHAs (**Deficiency** and see **OFI-NSTec-7**).

In summary, EA noted some weaknesses within the NSTec EOC and IRG EIPs. For example, the EIPs do not provide adequate guidance to the EOC cadre on effectively using tools and resources to ensure situational awareness within the EOC. In addition, NSTec does not establish unambiguous predetermined PAs for onsite personnel within IRG 2120.002. Finally, NSTec lacks a supervisory judgement EAL for non-classifiable emergencies.

Training, Drills, and Exercises

Criterion:

To develop and maintain the necessary emergency response, a coordinated program of training and drills must be an integral part of the emergency management program and apply to all emergency response personnel and organizations relied on to respond to emergencies. For a training and proficiency program to be effective, it must include both initial and annual refresher training for the instruction and qualification of all personnel comprising the ERO, as well as drills and a formal exercise program. (Paraphrased from DOE Order 151.1C, Comprehensive Emergency Management System)

As mentioned in Section 5.1, EA noted issues with the ability of the LEDs and an EOC support unit player to perform their tasks. Specifically, the LEDs were unable to quickly use IRG-2120.002 to determine the categorization and classification of the event and associated PAs, and the EOC support unit player was unable to operate some of the equipment. NSTec provides LEDs with a one-time, detailed briefing on how to use IRG-2120.002. NSTec does not formally test the proficiency of the LEDs at the conclusion of the briefing, but the LED qualification card requires satisfactory demonstration of required activities, including the ability to use IRG-2120.002 to categorize and classify an emergency and determine appropriate PAs, to achieve initial qualification. Additionally, NSTec provides several opportunities for LEDs to practice using IRG-2120.002 during quarterly facility drills and periodic emails with mock emergencies to categorize and classify, but participation in these activities is optional and NSTec only requires that each LED participate in one drill annually to demonstrate proficiency.

NSTec does not provide specific training on the support unit player's more complex duties (such as setting up the video wall and initiating a VTC) in the position's qualification card, although NSTec provides informal, hands-on training on operating the equipment. The qualification card requires satisfactory demonstration of position checklist tasks for initial qualification, but does not require reading of relevant procedures, including job aids on operating the equipment. In addition, NSTec does not require personnel assigned to the position to participate in a drill annually (as required by NFO-EOC-PLN-101) or demonstrate continued proficiency.

For both positions, CD-2120.020, *Drill and Exercise Program*, requires ERO members to demonstrate proficiency in the performance of their duties; however, no procedures describe how this proficiency will be determined or documented or what remedial actions would be taken if personnel do not demonstrate proficiency. NSTec recognized the need for more formal training and testing of personnel. Current plans include upgrading the LEDs' initial training from a single briefing to a recurring training course with a formal test and requiring participation of ERO personnel in evaluated workshops to demonstrate proficiency, but a formal plan with corrective actions and due dates to implement this change does not exist. Nonetheless, NSTec does not currently require ERO personnel to demonstrate proficiency in the performance of their duties as required by DOE Order 151.1C (**Deficiency** and see **OFI-NSTec-8**).

EA also noted issues regarding the conduct of the exercise (discussed further in Section 5.1), specifically allowing an unplanned and unrealistic simulation, providing players with unearned information, and inappropriately prompting players to perform actions. CD-2120.020 and the training that NSTec provides to controllers and evaluators specifically state that:

- Unplanned simulations require the senior controller's approval.
- Players must earn information through their actions.
- C/Es and observers may not prompt players to perform actions.

However, the exercise plan only briefly discussed not prompting players to perform actions in the rules of conduct for controllers, evaluators, and observers, and NSTec omitted the other two topics. Further, in the pre-exercise briefing given to controllers, evaluators, and observers to highlight the important aspects of the exercise plan, NSTec only briefly discussed not prompting players and did not discuss the other two topics. Consequently, the exercise plan and pre-exercise briefing did not sufficiently reinforce the prohibited practices of unapproved simulations, providing unearned information, and prompting players (see **OFI-NSTec-5**).

Section 5.1 also contained issues related to the exercise planning process. CD-2120.020 requires the exercise plan to contain sufficient information and data to effectively conduct, control, and evaluate the exercise, but does not address having sufficient indicators in the scenario to drive the ERO towards the expected response. For the displaced drums at the HWSU included in the exercise, the exercise plan indicated that the LED would categorize that event as an OENRC based on EAL SJ-1; however, NSTec did not recognize during the exercise planning process that the exercise scenario did not match the indicators for that EAL or that an EAL did not exist that would allow the LED to make the desired categorization for the HWSU event.

Furthermore, the exercise plan did not contain enough exercise objectives designed to evaluate the performance expected during the exercise. During the exercise planning process, NSTec selected exercise objectives from a master set of objectives that cover all venues plus exercise control and evaluation. However, CD-2120.020 does not discuss the process for selecting or excluding certain exercise objectives during the exercise planning process. The resulting exercise plan did not include some objectives for player performance and exercise control and evaluation (where EA noted issues) even though NSTec expected performance of these actions during the exercise. For example, NSTec did not include objectives related to:

- EOC cadre using available tools and resources in responding to the incident
- EOC cadre providing adequate oversight of the incident based on development and tracking of objectives, strategies, and priorities
- EOC cadre establishing and maintaining effective and accurate internal communications between and among EOC groups and ERO venues
- Controllers providing planned and/or earned information
- Role players accurately demonstrating the proper simulation(s).

Additionally, NSTec's master set of objectives for exercise control and evaluation does not contain an objective prohibiting prompting of players by controllers, evaluators, and observers. Consequently, NSTec did not evaluate several aspects of player, controller, evaluator, and observer behavior exhibited during the exercise to determine whether their performance met expectations or required corrective actions (see **OFI-NSTec-6**).

In summary, NSTec provides initial training to LEDs on how to perform the critical tasks of determining the categorization/classification and associated PAs for an emergency, but provides only informal training to EOC support unit personnel on critical tasks. Further, NSTec does not specify the methods to formally determine and document the ERO's continued proficiency to perform critical tasks. In addition, exercise conduct processes did not prevent exercise controllers, C/Es, and an observer from injecting an unplanned and unrealistic simulation into exercise play, providing players with unearned information, and prompting several players to perform tasks during the exercise. The exercise planning process also did not result in an exercise plan that guided the ERO towards the desired response or a sufficient set of exercise objectives to evaluate expected performance.

Follow-Up to the 2014 EA Assessment Report Findings

The 2014 NNSS assessment report identified four findings regarding the emergency management program that warranted management attention to better prepare for and respond to significant events, including severe natural phenomena events. Importantly, EA identified that NNSS did not augment the information provided to state and county emergency management organizations to include offsite consequence assessment determinations derived from the facility EPHAs. Additionally, NNSS did not review sitewide backup power systems and associated testing and inspection programs for compliance with National Fire Protection Association (NFPA) codes and standards and ensure appropriate implementation of requirements.

NSTec appropriately entered the four findings into caWeb, a companywide corrective action tracking system, as Level 3 moderate issues. NSTec subsequently changed the findings to an adverse condition (with NFO's concurrence), which does not require NFO to approve and validate closure of the issues. NSTec developed a corrective action plan for each issue and closed all four issues. However, NSTec prematurely closed three of the four issues, and the corrective actions for these three issues were not effective in resolving the original findings.

Previous finding statement F-3: *The OCC backup power systems are neither tested as a NFPA level-2 system nor capable of supporting a 24-hour operating duration required to comply with NFPA-72 for a system that provides power to an operator-staffed supervisory station.*

EA previously identified that NSTec did not appropriately test and inspect the OCC backup power systems. The OCC uses an uninterruptible power supply (UPS) and diesel generator systems to provide backup power to an operator-staffed supervisory station, as defined by NFPA-72, *National Fire Alarm and Signaling Code*; however, the authority having jurisdiction (AHJ) did not evaluate the power systems to establish the appropriate test and inspection requirements. NFPA-72 requires this type of supervisory station to have backup power capable of 24 hours of operation without refueling/recharging and to comply with a level-2 test and inspection program described in NFPA-110, *Standard for Emergency and Standby Power Systems*, or NFPA-111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, as applicable to the type of power system.

Since 2014, NSTec completed significant corrective actions and closed the finding. The NSTec AHJ evaluated the OCC diesel generator and connected equipment and designated it as an NFPA-110 level-1 system (the most rigorous rating that an NFPA test and inspection program can give). NSTec also

developed work instructions (NSTec Work Package 3001670483, *Emergency Power System Preventive Maintenance*) to test and inspect the generator per these requirements, including an appropriate refueling frequency, duration classification testing, and load testing. The AHJ approved some deviations from NFPA-110, as allowed, with the most significant deviation being the reduction of inspection frequencies from weekly to monthly. EA considers these actions appropriate to close this finding.

Previous finding statement F-2: *NSTec does not ensure that either the NSF diesel generator system or the UPS system, which serves as backup power for NSF emergency egress lighting, is tested and maintained as an NFPA level-1 system, as required by NFPA-101.*

EA previously identified that the AHJ did not appropriately establish test and inspection requirements for the backup power systems for the NSF (which houses an EOC). At that time, facility personnel thought that a UPS or a diesel generator powered the NSF emergency egress lights upon loss of normal power. Facility personnel later determined that only the diesel generator provided backup power to the emergency egress lights. NFPA-101, *Life Safety Code*, requires diesel generator systems that provide emergency egress lighting to comply with the level-1 test and inspection programs described in NFPA-110.

Since 2014, NFO and Alutiiq-Pacific, LLC (the NFO subcontractor tasked with testing and maintaining the NSF diesel generator), completed several actions and closed the finding. Alutiiq-Pacific, LLC, issued a new *Generator Testing and Maintenance Procedure* that included NFPA-110 level-1 test and inspection requirements for the generator and tested the generator using the new procedure as the basis for closing the finding. Since then, NFO clarified the responsibilities and authorities between the two organizations' AHJs in a letter.

The new *Generator Testing and Maintenance Procedure* is consistent with NFPA-110 level-1 requirements in many areas. The procedure requires the following tests, inspections, and administrative requirements from NFPA-110:

- Load testing the generator
- Monthly exercise of the automatic transfer switch
- Annual test of the automatic transfer switch
- Routine inspections of all generator and generator support systems
- Annual fuel sampling and analysis
- A schedule of test and maintenance activities
- Administrative requirements for test records and vendor manuals
- Verification of emergency light illumination during testing while on generator power.

Nevertheless, the AHJ did not approve the following deviations from NFPA-110 level-1 test and inspection requirements:

- The test procedure acceptance criteria indicate that Alutiiq-Pacific, LLC, tests the generator as a type 15 generator, but the AHJ has not identified the NSF generator type to establish the appropriate test criteria.
- NFPA requires a monthly load test, but the procedure states that the test is done quarterly, and Alutiiq-Pacific, LLC, actually performs the test annually.
- Alutiiq-Pacific, LLC, performs the load test of the generator using an unknown amount of connected equipment rather than the nameplate rating loads specified by NFPA-110.
- Alutiiq-Pacific, LLC, does not perform a class duration test.
- Alutiiq-Pacific, LLC, performs required weekly NFPA-110 inspections on a monthly frequency.

The closure of this finding was premature. Although Alutiiq-Pacific, LLC, completed some corrective actions associated with previous finding F-2, NFO and Alutiiq-Pacific, LLC, have not yet resolved the original finding, as required by DOE Order 151.1C (**Deficiency** and see **Finding F-AP-1** and **OFI-AP-1**).

Previous finding statement F-1: *Emergency Planning and Preparedness has not ensured that site/facility-specific EALs include predetermined PARs for the public corresponding to each General Emergency event analyzed in the EPHAs, as required by DOE Order 151.1C.*

Previous finding statement F-4: *Because NNSC has not effectively interfaced with offsite agencies, some emergency response activities (e.g., offsite PAs, monitoring and consequence assessment plans, and actions anticipated by each interface agency) have not been integrated or coordinated as required by DOE Order 151.1C.*

EA previously identified that the NNSC EALs contained protective action statements for onsite personnel; however, there were no clearly defined statements associated with EALs for conveying recommended protective measures to offsite agencies for General Emergencies. Consequently, NSTec did not provide enough information to allow offsite agencies to efficiently and effectively make PA decisions related to the site's recommendations for General Emergencies, possibly resulting in offsite PAs being delayed or ineffective. NSTec addressed this issue by developing and issuing PAR cards to the surrounding offsite agencies that allow the agencies to correlate the PAR distance provided in the offsite notification form with protective measures.

Further, EA previously identified that offsite organizations were unaware of bounding event scenarios documented in the EPHAs, distance to PAC projections, and plume arrival times at specific offsite receptors outside of the facility emergency planning zones. Consequently, offsite officials are unaware that they may need to expand PAs beyond the facility emergency planning zones.

NSTec combined findings F-1 and F-4, conducted an apparent causal analysis, and completed a surveillance to determine additional gaps associated with the two findings and to identify activities required to close findings F-1 and F-4, along with activities to strengthen the programs related to the findings. The surveillance report concluded that there are unique circumstances and challenges with respect to implementing all DOE offsite response interface guidance. NSTec identified that NNSA/NFO and NSTec will have to collaboratively evaluate the results of the surveillance and establish how best to incorporate additional details into the site's emergency management program and determine a path forward relative to offsite interface. The report also grouped the proposed NSTec corrective actions into two groups, EA findings and programmatic issues, to assist with managing the corrective actions. NSTec

addressed the corrective actions assigned to the EA findings through minor revisions to NFO-EOC-PLN-101. NSTec plans to address the programmatic corrective actions (which also correct issues noted in the EA findings) through a major revision to NFO-EOC-PLN-101 due at the end of June 2016, but NSTec did not enter the programmatic corrective actions in caWeb for tracking.

Although NSTec completed the corrective actions assigned to the EA findings, the corrective actions did not resolve the original issues to establish and maintain effective offsite interfaces, as required by DOE Order 151.1C (**Deficiencies** and see **Finding F-NSTec-1**). The NSTec surveillance identified 11 programmatic corrective actions that NSTec has not completed, but are relevant to resolving the 2014 findings noted by EA to include:

- Enhancing public protection planning by identifying:
 - Assumptions made by the facility as the basis for public protection planning
 - Actions anticipated by each interface agency and information required by each agency to respond effectively
 - Potential PARs (e.g., sheltering, evacuation, relocation, food control)
 - Evacuation routes for site personnel and offsite public
 - Geographic areas for PA, special needs populations, and other locations of significance with regard to hazardous material releases.
- Identifying the level to which specific hazardous materials at the site, including their characterization (quantities, storage, and use locations; the magnitude and impact of potential release consequences; and the characteristic health effects of each hazardous material), will be incorporated in interfaces between onsite and offsite medical and other response capabilities
- Providing additional consequence assessment descriptions to include:
 - Specifics with regard to understanding differences in modeling methods and engineering units used in consequence assessments
 - Clarification of how NSTec calculates a PAC of one rem using various methodologies
 - Information that the State of Nevada needs to perform its consequence self-assessment.
- Identifying a formal mechanism to offer offsite interface organizations facility-specific orientation training on hazards, protection from the hazards, emergency response procedures, and emergency notifications and communications.
- Determining what information in emergency plans and PAs will be provided to the public before an emergency to ensure the public understands the following:
 - Messages given during an emergency
 - Specific hazards associated with NNSA/NFO programs and activities as identified in the emergency planning hazards surveys and EPHAs.

Overall, NSTec appropriately entered the 2014 findings into caWeb and the corrective actions for previous finding F-3 effectively resolved the issue. However, the remaining three findings were closed without resolving the original issues. Consequently, NFO and NSTec did not resolve how to provide information needed by state and county emergency management organizations to respond to NNS emergency with offsite consequences. Additionally, the NSF backup power system for emergency egress lighting does not fully comply with NFPA codes and standards and the AHJ did not approve deviations from these codes and standards.

6.0 FINDINGS

Findings are deficiencies that warrant a high level of attention from management. If left uncorrected, findings could adversely affect the DOE mission, the environment, the safety or health of workers and the public, or national security. DOE line management and/or contractor organizations must develop and implement corrective action plans for EA appraisal findings. Cognizant DOE managers must use site- and program-specific issues management processes and systems developed in accordance with DOE Order 227.1A to manage these corrective action plans and track them to completion. In addition to the findings, deficiencies that did not meet the criteria for a finding are listed in Appendix C, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

Alutiq-Pacific, LLC

Finding F-AP-1: Corrective actions were not effective in resolving the original 2014 finding for not appropriately testing the NSF generator. (DOE Order 151.1C)

National Security Technologies, LLC

Finding F-NSTec-1: Corrective actions were not effective in resolving the original 2014 findings related to the information provided to state and county emergency management organizations. (DOE Order 151.1C)

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified some OFIs to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies identified in appraisal reports, they may also address other conditions observed during the appraisal process. EA offers these OFIs as recommendations for line management consideration; they do not require formal resolution by management through a corrective action process and are not intended to be prescriptive or mandatory. Rather, they are suggestions that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

Nevada Field Office

OFI-NFO-1: To improve Federal oversight of the response, consider:

- Delegating specific decision-making authority and responsibilities to the SFO during an incident that includes:

- Designating a senior official as the emergency manager
- Verifying or confirming onsite PAs and offsite PAR decisions
- Overseeing the facility/site response and providing guidance and operational direction to the facility/site management
- Coordinating the tactical response to an event with tribal, state, and local governments.
- Specifying the individuals who will serve as the NNSS spokespersons and training them accordingly.

National Security Technologies, LLC

OFI-NSTec-1: Consider improving the offsite notification process by:

- Automating the cumbersome process to notify state and local officials and the DOE and NNSA Headquarters Operations Center of an Alert, SAE, or General Emergency.
- Providing the initial emergency notification to the DOE and NNSA Headquarters Operations Center via a phone call within 15 minutes of the SAE declaration, giving all known information, with an email or a fax sent either immediately before or after the phone call that provides the same information.
- Emphasizing in training, drills, and exercises that initial notifications include accurate information and as much of the following information as possible:
 - Declaration of an OE and classification of the emergency
 - Description of the emergency
 - Date and time of emergency discovery
 - Damage and casualties
 - Other facility/site operations or program activities stopped because of the emergency
 - PAs taken and/or recommended
 - Recipients of offsite notifications
 - Weather conditions at the emergency scene
 - Level of any media interest
 - Contact information for the DOE and NNSA points of contact.

OFI-NSTec-2: Consider enhancing the timeliness of categorization and classification for HWSU events by clearly highlighting on the waste inventory when NSTec is storing extremely hazardous materials at the HWSU.

OFI-NSTec-3: Consider improving EOC communications by:

- Developing a guide of EOC tools and resources for the EOC cadre.
- Establishing recorder positions at the command table at both EOCs to capture key information so the command staff can focus on strategic issues instead of administrative note-taking duties.
- Establishing a few WebEOC boards to display key information to help the EOC cadre's focus on a common operating picture, such as significant events, overall event strategy, field monitoring team status, and environment, safety, and health information regarding hazards.
- Establishing key WebEOC status boards for initial display for all events and incorporating initial board display requirements into the support unit position checklists.
- Reformatting the key WebEOC status boards to display approximately 10 to 15 entries at a time (as the chat room board displays) rather than the 3 or 4 entries that the boards currently display.
- Clearly assigning the responsibility for capturing, validating, and disseminating specific event Information (*Office of Enterprise Assessments Lessons Learned from the 2014 Emergency Management Reviews*, April 2015).
- Expanding the use of incident management tools to allow a rapid interface with other systems necessary to communicate a common operating picture and shared situational awareness by:
 - Providing a real-time description of events at the incident scene
 - Providing details of the ERO's response to the incident
 - Enabling the ERO to predict changes during the incident
 - Supporting ERO objectives that forecast future actions
 - Integrating incident management tools with other web-based geographical information systems to provide ERO personnel with views, data, and analysis tools for the site, surrounding area, and interiors of many onsite buildings, including:
 - Meteorological monitoring data
 - Plume projections
 - Damage assessments
 - Field monitoring data
 - Site master planning data and engineering drawings (such as site drawings, utility drawings, and facility floor plans)
 - Personnel data

- Facilities information management data (*Office of Enterprise Assessments Lessons Learned from the 2014 Emergency Management Reviews*, April 2015).
- Defining expected actions for achieving and maintaining situational awareness among all teams (*Office of Enterprise Assessments Lessons Learned from the 2014 Emergency Management Reviews*, April 2015).

OFI-NSTec-4: Consider improving EPI response by:

- Maintaining chronological files with news releases, pending releases, media inquiries, and rumor control by:
 - Clarifying the times of release and approvals of releases to the public
 - Documenting the process for tweets that contain information from previously approved releases
 - Clarifying who can approve social media content.
- Specifying the individuals who will serve as the NNSS spokespersons and training them accordingly.

OFI-NSTec-5: Consider enhancing exercise conduct and evaluation processes by:

- Expanding the exercise plan rules of conduct for controllers, evaluators, and observers and pre-exercise briefing to include a more detailed discussion on providing earned information, prompting players, and including unplanned simulations.
- Emphasizing during pre-exercise briefings and training the importance of:
 - Providing players with only earned information
 - Not prompting or assisting players to perform their duties
 - Using the C/E radio network to obtain additional guidance when needed
 - Obtaining the approval of the senior controller before introducing an unplanned simulation into the exercise.
- Recruiting and training a sufficient number of controllers and evaluators to minimize the need for assigning dual C/E responsibilities.
- Promoting an exercise evaluation culture that seeks program improvements (*Office of Enterprise Assessments Lessons Learned from the 2014 Emergency Management Reviews*, April 2015).

OFI-NSTec-6: Consider augmenting the exercise planning process by:

- Revising CD-2120.020 to include more detailed guidance on including the appropriate indicators in the exercise plan needed to drive desired ERO performance.

- Broadening the scope of full-scale exercises to take advantage of opportunities to:
 - Interact with offsite organizations
 - Exercise a wider range of EOC cadre and CAT responsibilities
 - Practice determining and implementing onsite PAs and transmitting offsite PARs
 - Rescue, triage, and treat injured personnel.
- Excluding only those exercise objectives not expected to be performed during the exercise.
- Developing an exercise control and evaluation exercise objective that evaluates whether controllers, evaluators, or observers prompt players.
- Including all exercise control and evaluation exercise objectives in each exercise.

OFI-NSTec-7: Consider improving IRG-2120.002 by:

- Establishing facility specific PAs that provides unambiguous guidance to the LED
- Defining the terms “immediate affected area” and “nearby facility”
- Incorporating a supervisory or discretionary EAL for an OENRC similar to IRG-2120.001 EAL SJ-1
- Reviewing and validating the functionality of all EALs changed in the IRG 2120.001 revision to IRG-2120.002.

OFI-NSTec-8: Consider improving the ERO training program by:

- Formalizing the NSTec plan for training program enhancements to include upgrading training and more frequent testing of LEDs, and holding evaluated workshops for ERO members to demonstrate their continued proficiency
- Providing team training where LEDs and OCC DMs work together on categorizing and classifying events
- Formalizing the training provided to EOC support unit personnel on the more complex duties of their position, and testing their ability to perform these duties
- Revising OP-2120.036, *ERO Qualification and Watchbill or Notification List Requirements*, to include a description of the process for determining and documenting that ERO members are proficient in performing their duties and remediation requirements for ERO members not demonstrating proficiency
- Reviewing drill and exercise schedules to determine whether ERO members have enough opportunities to practice response tasks (*Office of Enterprise Assessments Lessons Learned from the 2014 Emergency Management Reviews*, April 2015)

- Observing and critically evaluating training, drills, and exercises to ensure that responders perform appropriately and receive appropriate feedback for incorrect actions (*Office of Enterprise Assessments Lessons Learned from the 2014 Emergency Management Reviews*, April 2015).

Alutiq-Pacific, LLC

OFI-AP-1: Consider complying with NFPA-110 by:

- Performing a crosswalk between the test and inspection activities specified by NFPA-110 and the *Generator Testing and Maintenance Procedure*
- Evaluating deviations between NFPA-110 and the generator test and maintenance program for inclusion or properly justified exceptions; properly justified exceptions should have a basis, such as physical designs, vendor recommendations, machinery history, compensatory measures, and problems from testing too frequently
- Documenting the exceptions and justifications and the AHJ approval of them
- Performing tests and inspections using the methods and frequencies stated in procedures.

Appendix A Supplemental Information

Dates of Review

Onsite Assessment: February 2-4, February 22-25, and March 8-10, 2016

Office of Enterprise Assessments (EA) Management

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

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EA Reviewers

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Kurt W. Runge
John D. Bolling
Teresa A. Lachman
Charles B. Lewis
Thomas Rogers
William J. Scheib

Appendix B

Key Documents Reviewed, Interviews, and Observations

Documents Reviewed

- Alutiiq-Pacific *Generator Testing and Maintenance Procedure*
- CD-2120.020, *Drill and Exercise Program*, Rev. 4, 11/6/14
- IRG-2120.001, *Nevada National Security Site Initial Response Guide*, Rev. 4, 8/8/13
- IRG-2120.002, *Nevada National Security Site Initial Response Guide*, Rev. 2, 11/24/15
- NFO Order 111.X, *U.S. Department of Energy National Nuclear Security Administration Nevada Field Office Functions, Responsibilities, and Authorities*, 10/20/15
- NFO-149, *National Nuclear Security Administration Nevada Field Office Emergency Notification Form*, Rev. 0
- NFO-EOC-PLN-101, *Consolidated Emergency Management Plan*, Rev. 1, 9/14/15
- *NNSA/NFO Emergency Public Information Program Manual*, 3/15
- *NNSA/NFO Nevada National Security Site and North Las Vegas Facilities General Use and Operations Requirements*, 10/9/13
- NSTec Work Package 3001670483, *Emergency Power System Preventive Maintenance*, 9/24/14
- OP-2120.035, *Emergency Procedures and Supporting Documents Process*, Rev. 4, 9/2/15
- OP-2120.036, *Emergency Response Organization Qualification and Watchbill or Notification List Requirements*, Rev. 3, 3/4/14
- OP-2120.049, *Incident Command System*, Rev. 3, 10/5/15
- OP-2120.078, *Operations Command Center Standard Operations*, Rev. 3, 5/22/14

Interviews

- Air Resources Laboratory/Special Operations and Research Division Director/Consequence Assessment Team Members
- Alutiiq-Pacific Project Manager/Authority Having Jurisdiction
- NFO Contractor Officer's Representative
- NFO Public Affairs Officer
- NFO Senior Federal Official
- NSTec Emergency Management Coordinators (3)
- NSTec Emergency Planning and Preparedness Department Manager
- NSTec Emergency Response Organization Training Officer
- NSTec Equipment Manager
- NSTec Exercise Director and Site Exercise Coordinator
- NSTec Operations Command Center Duty Manager
- NSTec Operations Command Center Manager
- NSTec Procedures Coordinator
- NSTec Radioactive Waste Management Complex/Hazardous Waste Storage Unit Local Emergency Director
- NSTec Readiness Assurance Coordinator
- NSTec Senior Hazards Analyst
- NSTec Simulation Center Chief Controller and Emergency Facilities and Equipment
- NSTec Support Unit personnel (2)
- NSTec Work Planner

Observations

- Consequence Assessment Response
- Emergency Operations Centers Response
- Incident Command Response
- Local Emergency Director Response
- Operations Command Center Response

Appendix C Deficiencies

Deficiencies that did not meet the criteria for a finding are listed below, with the expectation from U.S. Department of Energy (DOE) Order 227.1A, *Independent Oversight Program*, for site managers to apply their local issues management processes for resolution.

Nevada Field Office

- The NNSA Nevada Field Office (NFO) plans do not specify the decision-making authorities and responsibilities of the Senior Federal Official, as required by DOE Order 151.1C.
- NFO did not clearly specify in writing the delegation of specific authorities from the NFO site manager to the Senior Federal Official, as required by NFO Order 111.X, *U.S. Department of Energy National Nuclear Security Administration Nevada Field Office Functions, Responsibilities, and Authorities*.
- The Senior Federal Official checklist does not specify that the Senior Federal Official oversee the facility/site response or coordinate the tactical response to the event with tribal, state, and local governments, as required by DOE Order 151.1C.

National Security Technologies, LLC

- National Security Technologies, LLC (NSTec), did not complete all required notifications with DOE and National Nuclear Security Administration (NNSA) Headquarters and offsite agencies within 15 minutes of the Site Area Emergency declaration, as required by DOE Order 151.1C, *Comprehensive Emergency Management System*.
- NSTec did not provide for continuing effective communication among the emergency operations center response organizations throughout the emergency, as required by DOE Order 151.1C.
- NSTec did not effectively control and evaluate the exercise, as required by DOE Order 151.1C.
- NSTec has not developed specific emergency action levels for the spectrum of potential Operational Emergencies identified by the emergency planning hazards assessments, as required by DOE Order 151.1C.
- NSTec does not require a demonstration of proficiency by the emergency response organization, as required by DOE Order 151.1C.
- NSTec has not provided analyzed emergency planning hazards assessment consequences results to the offsite authorities, as required by DOE Order 151.1C.
- NSTec has not provided the information that offsite authorities need to respond to Nevada National Security Site emergencies, as required by DOE Order 151.1C.

Alutiq-Pacific, LLC

- Alutiq-Pacific, LLC, closed the previous Office of Enterprise Assessments finding on the Nevada Support Facility diesel generator test and inspection program without complying with NFPA-110, *Standard for Emergency and Standby Power Systems*.