

**Office of Enterprise Assessments Review of the
Sandia National Laboratories/New Mexico
Emergency Management Exercise Program**



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Acronyms

CAP	Corrective Action Plan
CDNS	Chief of Defense Nuclear Safety
CRAD	Criteria, Review, and Approach Document
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
EEG	Exercise Evaluation Guide
EOC	Emergency Operations Center
EPHA	Emergency Planning Hazards Assessment
ERO	Emergency Response Organization
FY	Fiscal Year
HAZMAT	Hazardous Material
IC	Incident Commander
NNSA	National Nuclear Security Administration
OE-1	Operating Experience Level 1
OFI	Opportunity for Improvement
PA	Protective Action
SBMS	SFO Business Management System
SFO	Sandia Field Office
SNL/NM	Sandia National Laboratories/New Mexico

Office of Enterprise Assessments Review of the Sandia National Laboratories/New Mexico Emergency Management Exercise Program

EXECUTIVE SUMMARY

The U.S. Department of Energy's independent Office of Enterprise Assessments (EA) conducted a review of the emergency management exercise program at the National Nuclear Security Administration (NNSA) Sandia National Laboratories/New Mexico (SNL/NM). This review complements EA's severe event response review performed at SNL/NM in 2014 to allow conclusions based on a more complete evaluation of the exercise program. The purpose of this EA assessment was to evaluate the exercise program's effectiveness in validating, through tests and demonstrations, all elements of the SNL/NM emergency management program and fostering continuous program improvements. EA performed this review from May 5 to June 4, 2015. EA also drew on its observations of SNL/NM exercise planning and execution activities from the 2014 severe event exercise to reach conclusions for this review.

The Sandia Corporation serves as the management and operating contractor for SNL/NM. The SNL Emergency Management department manages the site-level emergency management program, and the NNSA Sandia Field Office (SFO) provides Federal oversight.

SNL Emergency Management has adequately incorporated the DOE Order 151.1C, *Comprehensive Emergency Management System*, requirements into the exercise program. SNL Emergency Management appropriately documents the exercise program description and implementing processes, including the processes used to design, develop, conduct, evaluate, and document emergency management exercises. SNL Emergency Management also uses a structured process for evaluating exercises, prepares in-depth after-action reports that list issues noted during the exercise, assigns reasonable due dates, and completes timely corrective actions. In addition, SNL Emergency Management has enhanced its ability to respond to a severe event and effectively conducted and controlled several aspects of the 2014 severe event exercise. Sandia Corporation has a detailed process for resolving issues that includes appropriate instructions for performing causal analyses, extent-of-condition reviews, and independent verification of corrective action closure. SFO conducted a comprehensive self-assessment of its emergency management program responsibilities and several performance-based assessments of SNL Emergency Management exercise program.

However, EA identified weaknesses in SNL Emergency Management's and SFO's implementation of the emergency exercise and issues management programs:

- In the area of evaluation and validation, the exercise evaluation guides do not include observable and measurable evaluation criteria for each objective that would promote an objective evaluation of responder performance, so exercise evaluators rely heavily on their own experience in recognizing emergency response organization performance issues. SNL Emergency Management also does not adequately confirm the ability to shelter, evacuate, and account for personnel because evaluated drills are not conducted to validate some parts of the site emergency management program. In addition, SNL Emergency Management allowed six trusted agents to also act as exercise players, with three in key decision-making roles; since these individuals had prior knowledge of the exercise scenario, their participation invalidated some aspects of the exercise results. Finally, SNL Emergency Management has not validated planning for some important elements of the emergency management program, such as responding to hazardous material release scenarios for bounding events, utilizing alternate command centers, or implementing response plans for large fires in hazardous material facilities. With regard to

Federal oversight, SFO does not perform comprehensive assessments of the contractor exercise program.

- In the area of program improvement, SNL Emergency Management and SFO self-identified that SNL/NM has not effectively validated some necessary capabilities for responding to severe events, and EA identified additional weaknesses in this area. The SNL Emergency Management procedures do not address developing corrective actions within 30 working days as required, and they do not require independent validation of corrective action effectiveness for all findings. EA noted several weaknesses in the implementation of the issues management process, including incorrectly categorizing some issues and failing to conduct causal analyses for several findings. EA also noted several corrective actions that would not prevent recurrence of an issue, and SNL Emergency Management closed some findings and corrective actions before the underlying issues were resolved. SFO and SNL Emergency Management make minimal use of lessons-learned systems. SFO also had several deficiencies in the area of program improvement in that SFO does not use its issues management process to resolve emergency management issues that require SFO action and did not develop corrective actions for one finding and seven weaknesses from a 2014 Chief of Defense Nuclear Safety review. These issues remain unresolved.
- In the area of program documentation, SNL Emergency Management does not always take corrective actions to resolve emergency response organization performance issues noted by evaluators. SFO does not document its evaluation criteria in its contractor assessment reports.

Overall, the Sandia Corporation and SFO have adequately documented the processes for exercise planning and evaluation, as well as for issues management. However, EA noted weaknesses that result in the exercise program and corrective action process having limited effectiveness in accomplishing stated program objectives. The absence of evaluation criteria for exercise objectives, timely corrective actions, and independent validation that corrective actions were effective, have decreased the effectiveness of these components of the emergency management program.

Office of Enterprise Assessments Review of the Sandia National Laboratories/New Mexico Emergency Management Exercise Program

1.0 PURPOSE

The U.S. Department of Energy (DOE) independent Office of Enterprise Assessments (EA) conducted a review of the emergency management exercise program at the National Nuclear Security Administration (NNSA) Sandia National Laboratories/New Mexico (SNL/NM). This review complements EA's severe event response review performed at SNL/NM in 2014 to allow conclusions based on a more complete evaluation of the Sandia Corporation exercise program. The purpose of this EA assessment was to evaluate the exercise program's effectiveness in validating, through tests and demonstrations, all elements of the SNL/NM emergency management program and fostering continuous program improvements.

EA performed this review from May 5 to June 4, 2015. This report discusses the scope, background, methodology, results, and conclusions of the review. The review team's findings and opportunities for improvement (OFIs) are also included.

2.0 SCOPE

This EA review assessed the effectiveness and implementation of the emergency management exercise program established by the Sandia Corporation, as well as the line oversight of the exercise program provided by the NNSA Sandia Field Office (SFO). The *Plan for the Office of Enterprise Assessments Review of Emergency Management at the Sandia National Laboratories/New Mexico*, dated March 19, 2015, describes the specific focus of this review. This review evaluated the site's exercise program to determine whether it uses plausible and realistic Operational Emergency event scenarios, validates all elements of the emergency management program, effectively evaluates emergency response, properly conducts exercises, and provides a means to improve the site's preparedness to respond to Operational Emergencies. The review evaluated key exercise program documents; exercise planning and implementation activities for the fiscal year (FY) 2014 severe event exercise; exercise after-action reports for the past five years; corrective action processes for deficiencies, weaknesses, and improvement items identified during exercises; and use of lessons-learned programs.

3.0 BACKGROUND

SNL/NM provides critical elements of the NNSA's missions that ensure the safety, reliability, and performance of the U.S. nuclear weapons deterrent. The primary mission of SNL/NM is research and development. Its mission areas include nuclear weapons; nonproliferation and assessments; military technologies and applications; energy and infrastructure assurance; homeland security; and science, technology, and engineering. SNL/NM has sufficient quantities of radioactive material and hazardous chemicals to require SNL/NM to have an Operational Emergency hazardous material (HAZMAT) program in accordance with DOE Order 151.1C, *Comprehensive Emergency Management System*.

The Sandia Corporation has assigned responsibility for the emergency management program to the SNL Emergency Management department. SNL/NM has a site-level emergency response organization (ERO), which responds to all emergency events within the SNL/NM boundaries. As the 24-hour point of contact for SNL/NM, the incident commander (IC) initially directs site-level responses. When an Operational Emergency occurs at SNL/NM, personnel notify appropriate personnel, and the IC then implements the

emergency plan and procedures. The IC initially categorizes the incident and determines the proper emergency classification in accordance with established emergency action levels, and may activate the ERO. The emergency operations center (EOC) provides site-level support to the IC, including activating and deploying additional site response assets to the scene, sending mutual aid requests to Kirtland Air Force Base, providing technical support such as site field monitoring, coordinating with state and local governments, and performing notification and communications functions.

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

This EA review evaluated the SNL emergency management exercise program to assess how thoroughly the site-level exercises tested the SNL/NM emergency management program over the past five years and how effective the exercise program has been in fostering continuous improvements and lessons learned. As part of the five-year program review, EA also examined the use of severe event exercise scenarios described in the 2013 DOE's Operating Experience Level 1 (OE-1), *Improving Department of Energy Capabilities for Mitigating Beyond Design Basis Events*. EA also reviewed how the corrective action process was applied to address the internal findings from the SNL Emergency Management after-action report for the FY 2014 severe event exercise.

EA's exercise review in 2014 identified several strengths and issues. Personnel readily performed their duties in the face of a challenging exercise scenario. The IC appropriately assessed and prioritized the emergency response activities, and prioritized the response to reported injuries to ensure that the most critically injured patients were treated first. However, EA also identified some performance issues. Significantly, EA observed inadequate communications and information management that degraded situational awareness and prevented a common operating picture among onsite and offsite organizations. Additionally, the IC did not promptly and accurately classify the emergencies based on the actual and potential releases of HAZMAT to determine the appropriate protective actions (PAs). Further, the IC did not modify PAs when the situation changed after the potential and simulated releases of HAZMAT became known. Finally, the ERO did not adequately track the status of injured personnel. This 2015 review evaluated the effectiveness of corrective actions associated with these issues by looking at corrective action plans (CAPs); the processes used to track and close out corrective actions; and the records and documents that serve as objective evidence of completed actions.

4.0 METHODOLOGY

As identified in the EA review plan, this review considered the requirements related to the emergency management exercise program issued through DOE Order 151.1C for an Operational Emergency HAZMAT program. The EA review team used key aspects of these requirements as set out in the inspection criteria and lines of inquiry of Criteria, Review, and Approach Document (CRAD) 45-61, *Exercise Program Review and Severe Event Response Evaluation*. EA completed the SNL/NM review under CRAD 45-61 through two inspections and separate reports. In 2014, EA evaluated the site's response to a postulated severe event, as planned and conducted by SNL Emergency Management for their annual site-level exercise, and issued a report on the site's response. This 2015 report discusses both EA's exercise program review and the site's actions addressing the findings from the SNL Emergency Management FY 2014 severe event exercise after-action report.

To gather data for this 2015 review, the EA team examined key documents, such as the site emergency plan, exercise program procedure, exercise plans, exercise schedules, the set of exercise objectives, after-action reports, CAPs, the corrective action tracking system, records associated with corrective action closure, and the use of corporate and DOE/NNSA lessons-learned programs. The EA team also interviewed key personnel responsible for developing and executing the exercise program and used the observations from the FY 2014 severe event exercise in arriving at conclusions. The members of the EA team, the Quality Review Board, and EA management responsible for this review are listed in Appendix A. Appendix B provides a detailed list of the documents reviewed and personnel interviewed.

5.0 RESULTS

The results of this review are organized around six principal components of an exercise program: exercise plans and procedures, exercise evaluations, after-action reports, exercise conduct, corrective actions and improvements, and lessons learned. In addition, Section 5.4 addresses the severe event exercise evaluation component described in OE-1.

5.1 Exercise Plans and Procedures

Review Criteria:

A formal exercise program must validate all elements of an emergency management program over a 5-year period. The exercise program must validate facility and site-level emergency management program elements by initiating 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 must use an effective, structured approach that includes documentation of specific objectives, scope, time lines, injects, controller instructions, and evaluation criteria for realistic scenarios. (DOE Order 151.1C, paraphrased from CRAD 45-61)

For this portion of the review, EA reviewed the site emergency plan, exercise procedure, the exercise objectives bank, the FY 2014 severe event exercise after-action report, the six-year exercise schedule, and exercise plans and after-action reports for the last five years.

SNL Emergency Management has established an adequate exercise planning process using a structured approach. SNL Emergency Management has appropriately documented the exercise program description and implementing processes in NM-EM-PLAN-01, *SNL/NM-Tonopah Test Range Emergency Plan*, and procedure NM-EX-PD-01, *Emergency Management Exercise Program*, which includes the processes that SNL Emergency Management uses to design, develop, conduct, evaluate, and document sitewide emergency management exercises. Collectively, these documents incorporate the applicable DOE Order 151.1C requirements, except for two NNSA-approved temporary exemptions.

The NNSA Office of Emergency Operations granted SFO two exemptions on September 11, 2008, as part of the effort to transition from transactional oversight to systems based oversight of the contractor. The first exemption relieves SFO from approving the annual site exercise package, based on the understanding that SNL Emergency Management will provide a review copy to SFO 30 days before the exercise, which SNL Emergency Management has done consistently. SFO was also required to review the methodology for developing exercise packages during SFO assessments of the exercise program elements, which SFO has done by observing the regularly scheduled exercise planning meetings. The second exemption relieves SFO from submitting SFO-approved exercise packages to the program secretarial officer and the Director, NNSA Office of Emergency Operations. NNSA granted the exemption based on the

understanding that SFO reviews the approved exercise package before the exercise, and provides feedback on the adequacy and effectiveness of the exercise package.

SNL/NM has a single ERO that responds to all emergency events within the SNL/NM boundary, so a site-level exercise program is adequate to validate the emergency management program. Appropriately, SNL Emergency Management has conducted an annual exercise in each of the last five years, and SNL Emergency Management has conducted several other exercises to validate elements of the emergency management program. SNL/NM has also participated in the NNSA Office of Emergency Operations no-notice exercise program; the last such exercise was conducted on June 16, 2009.

SNL Emergency Management also adequately documents the schedule for executing an ongoing five-year exercise program in a *Six-Year Exercise Scheduling Plan*, using hazards and response element matrices, as required by the *Emergency Management Exercise Program* procedure, to ensure that exercises address all program elements and all documented hazards over a five-year period. However, this plan is an informal document and is not included in the annual emergency readiness assurance plan, as required by the site emergency plan. (See Section 8.0, **OFI-SANDIA-1**.) SNL Emergency Management invites all offsite response organizations to participate in their annual exercises; however, these invitations are extended only verbally and are not followed up with a written invitation. Additionally, although informally invited, several offsite EROs (i.e., Presbyterian Health Care Services, Lovelace Health Services, and the New Mexico Department of Homeland Security) have not participated in an exercise during the last five years. (See Section 8.0, **OFI-SANDIA-2**.)

Although the *Emergency Management Exercise Program* procedure requires all exercises to be based on objectives and each objective is required to be attainable and measureable, the exercise program process suffers from limitations in the exercise objectives and evaluation criteria used to establish the breadth and depth of exercise evaluations. Most importantly, the process does not provide the corresponding site-specific standards of performance for each objective in the objective bank; such standards are essential for exercise evaluators to determine whether an objective has been met by measuring responders' performance against predetermined program-specific documentation, such as the site's emergency plans and procedures. (See Section 8.0, **OFI-SANDIA-3**.) Since SNL Emergency Management does not provide standards of performance for each objective, SNL/NM exercise evaluators rely primarily on their own experience in recognizing ERO performance issues, as discussed in Section 5.2.

Finding F-SANDIA-1: Contrary to DOE Order 151.1C, SNL Emergency Management does not provide evaluation criteria for each exercise objective.

EA identified some additional weaknesses in the *Emergency Management Exercise Program* procedure. For example, SNL Emergency Management's process for evaluating exercises is similar to the guidance provided in DOE Guide 151.1-3, *Programmatic Elements Emergency Management Guide*, except that SNL Emergency Management does not categorize its findings as either deficiencies or weaknesses, as recommended by the guide. As a result, SNL Emergency Management does not recognize that some issues – called deficiencies, per the DOE guide – have a more significant impact on the program element and require greater urgency in implementing corrective actions than the lesser issues that the DOE guide calls weaknesses. (See Section 8.0, **OFI-SANDIA-4**.)

EA also identified that SNL Emergency Management does not perform evaluated PA drills. Consequently, SNL Emergency Management does not adequately confirm the ability to shelter, evacuate, and account for personnel because it does not use evaluated drills to validate parts of the site emergency management program. In addition, the *Emergency Management Exercise Program* procedure does not discuss evaluating actual responses using exercise evaluation criteria. (See Section 8.0, **OFI-SANDIA-4**.) Furthermore, SNL Emergency Management and SFO both noted that some of the recent annual

exercise plans were revised significantly during the week before the exercise, as documented in an errata sheet attached to the exercise plan (discussed further in Section 5.5). Finally, the Radiological First Responder Team has not participated in an exercise annually, and the *Emergency Management Exercise Program* procedure does not address how all site-level ERO elements are to participate in at least one exercise annually. SNL Emergency Management also self-identified this issue in their FY 2015 self-assessment.

Lastly, the SNL Emergency Management exercise program has not validated the full scope of some important program elements over a five-year period. For example, SNL Emergency Management has not conducted exercises that involve severe event or multi-facility HAZMAT release scenarios that correspond to an analyzed bounding event – i.e., a design basis event or a beyond-design-basis event in which the maximum inventory of a facility’s HAZMAT is released. In addition, SNL Emergency Management has not validated the planning for some other important aspects of the SNL/NM emergency management program, such as: (See Section 8.0, **OFI-SANDIA-5**.)

- Testing the capabilities of alternate command centers
- Testing all required PAs (i.e., remaining indoors, sheltering, and evacuating)
- Testing backup power systems during an integrated response
- Responding to large fires in HAZMAT facilities
- Testing the treatment of contaminated/injured employees at offsite hospitals.

In conclusion, SNL Emergency Management has established an adequate exercise program process to validate emergency management program elements at the site. The site emergency plan and the *Emergency Management Exercise Program* procedure appropriately incorporate the DOE requirements for the contents of an exercise plan, with the exception of fully documented evaluation criteria. Since SNL Emergency Management does not provide evaluation criteria for each objective, SNL/NM exercise evaluators mostly rely heavily on their own experience in recognizing ERO performance issues. EA also identified other weaknesses in the exercise process, such as defining findings, deficiencies, and weaknesses in a manner inconsistent with DOE Guide 151.1-3, and SNL Emergency Management does not adequately confirm the ability to shelter, evacuate, and account for personnel because it does not use evaluated drills to validate parts of the site emergency management program. Further, SNL Emergency Management has not validated planning for some important elements of the SNL/NM emergency management program during the past five years.

5.2 Exercise Evaluations

Review Criteria:

Exercises are evaluated and critiqued effectively and reliably and result in corrective actions and program improvements for identified program weaknesses. (DOE Order 151.1C, paraphrased from CRAD 45-61)

For this portion of the review, EA observed the FY 2014 severe event exercise and the controller and evaluator debrief held after the exercise. EA also reviewed the site emergency plan and the SNL Emergency Management exercise and issues management procedures, exercise plans, and exercise after-action reports.

SNL Emergency Management fully describes the exercise evaluation process in the *Emergency Management Exercise Program* procedure, and exercise packages provide for a documented evaluation of the exercises. The scenario material in the exercise packages is consistent with the exercise objectives and supports a demonstration of each objective. SNL Emergency Management also appropriately

documents in the exercise packages any limitations or simulations regarding the participation of onsite and offsite organizations. SNL Emergency Management typically uses an experienced group of evaluators who are familiar with the areas assigned for evaluation. In addition, SNL Emergency Management conducts a critique at each venue immediately after the exercise, using the protocol outlined in procedure NM-PA-CAR-3.3, *Incident/Event Feedback and Improvement Hotwashes and Critiques*, to foster critical assessments and to gather and document the participants' observations. SNL Emergency Management also conducts a formal factual accuracy review with controllers and evaluators after full-scale exercises to determine whether the responders accomplished the individual exercise objectives and to identify issues, based on a synthesis of all the observations and information gathered during the conduct of the exercise. SNL Emergency Management categorizes issues identified during exercises as either findings or observations.

EA noted some weaknesses in SNL Emergency Management's process for evaluating exercises. SNL Emergency Management provides controllers and evaluators with exercise-specific training that includes appropriate rules of conduct and guidelines for interactions with players, but provides this information only verbally. In addition, SNL Emergency Management rarely evaluates whether emergency response facilities and equipment are readily available, operational, and habitable and whether emergency response procedures contain adequate content. Further, the exercise evaluation guides (EEGs) do not allow evaluators to rate an objective as not met, contrary to DOE Guide 151.1-3. (See Section 8.0, **OFI-SANDIA-6.**) As previously discussed in Section 5.1, SNL Emergency Management's exercise process does not provide evaluation criteria for each objective, so none of the exercises conducted over the last five years used any evaluation criteria. The resulting evaluations were based more on the evaluators' subjective determinations than on observable, measurable evaluation criteria. (See **Finding F-SANDIA-1.**)

In conclusion, SNL Emergency Management uses a structured process for evaluating exercises and typically employs experienced evaluators. Exercise packages support a demonstration of exercise objectives and document any limitations or simulations regarding participation organizations. However, the exercise evaluation process does not ensure an effective and reliable evaluation of emergency responder performance, and all of the exercises conducted during the last five years lacked evaluation criteria. SNL Emergency Management rarely evaluates the status of emergency response facilities and equipment or the adequacy of emergency response procedures and does not allow evaluators to rate objectives as not met. Further, the EEGs do not include observable, measurable evaluation criteria for each objective that would promote an objective evaluation of responder performance.

5.3 After-Action Reports

Review criteria:

Evaluation reports for facility and site exercises must be completed within 30 working days and submitted to the Cognizant Field Element, the Program Secretarial Officer(s), and the Director, Office of Emergency Operations. (DOE Order 151.1C)

For this portion of the review, EA reviewed the site emergency plan and the SNL Emergency Management exercise plans and exercise after-action reports.

SNL Emergency Management prepares detailed, timely exercise after-action reports that identify numerous issues requiring resolution, correlated with the applicable exercise objectives. SNL Emergency Management assesses the input from evaluators and typically includes in the after-action reports any evaluators' comments on the responders' proficiency, communications, coordination, and familiarity with procedures and equipment. The after-action reports do not include recommended corrective actions that would further clarify the issues observed during the exercises; SNL Emergency Management waits to

develop corrective actions until the issues management process begins. (See Section 8.0, **OFI-SANDIA-7.**)

When evaluators' comments note instances where the observed performance did not meet the objective, SNL Emergency Management does not always categorize these issues as findings or observations warranting corrective action. In some cases, SNL Emergency Management has tasked the responsible organizations to conduct a surveillance to determine whether corrective actions were warranted, but this process has not always led to corrective actions. For example, after an FY 2011 exercise, an evaluator commented that security officers did not check the side of a building where two building occupants were located, one with a gunshot wound. In an FY 2012 exercise, the emergency response team transported an injured worker to the medical clinic without warning the medical staff that the patient was possibly contaminated with hydrochloric and nitric acids. In both of these cases, SNL Emergency Management did not categorize the issues as a finding or observation, and the responsible organizations did not perform a surveillance as tasked or document that any corrective actions were implemented. Further, in the FY 2014 severe event exercise, the SNL ERO accounted for only 31 of the 40 postulated injured workers, but SNL Emergency Management did not categorize this issue as a finding or observation. Consequently, SNL never addressed these issues. (See Section 8.0, **OFI-SANDIA-7.**)

In conclusion, SNL Emergency Management prepares detailed after-action reports that list issues noted during the exercise. The exercise evaluators provide assessments of emergency response performance and provide comments on the adequacy of responder actions. However, SNL Emergency Management does not include recommended corrective actions in their after-action reports and does not always take corrective actions to resolve ERO performance issues noted by evaluators.

5.4 Severe Event Exercises

Review criteria:

Severe event exercises include events that impact multiple facilities that cause the loss of infrastructure and primary capabilities and introduce secondary or compounding severe events that occur during critical stages of the initial response or during later remediation efforts. (OE-1 and CRAD 45-61)

For this portion of the review, EA reviewed the site emergency plan, the site's response to OE-1 actions, the FY 2014 severe event exercise after-action report, and other severe event exercise after-action reports.

In response to OE-1, SNL Emergency Management prepared two consolidated emergency planning hazards assessments (EPHAs), one combining the analyses for the two large chemical facilities in Technical Area-I, and the other addressing the four radiological/nuclear facilities in Technical Area-V. Additionally, SNL Emergency Management conducted a beyond design basis earthquake tabletop exercise on February 15, 2015, using the Technical Area-V EPHA, and documented the results in an after-action report. SNL Emergency Management has also incorporated beyond design basis event exercises into the *Six-Year Exercise Scheduling Plan*.

When SNL Emergency Management was planning its FY 2014 severe event exercise, EA requested inclusion of severe event components from a list of EA focus areas that were consistent with the OE-1 scenarios. SNL Emergency Management added many of the requested focused areas, so EA was able to evaluate their capabilities for responding to the types of severe events described in OE-1. The exercise scenario consisted of SNL/NM's response to a severe event involving a postulated tornado, widespread damage across SNL/NM, mass casualties, a missing container of radioactive material, and an unknown chemical spill. During that exercise, the SNL/NM ERO exhibited generally good command and control of the event. The IC appropriately established a unified command at the mobile incident command trailer

with representatives from security, radiation protection, the facilities management and operations center, and the Kirtland Air Force Base Fire Department.

Despite these strengths, EA identified several performance issues during the FY 2014 severe event exercise review; EA did not issue any associated findings in the EA review report, because SNL Emergency Management included the EA evaluator's input among the findings and observations in its exercise after-action report. EA's observations included inadequate communications and information management that degraded situational awareness and prevented a common operating picture among onsite and offsite organizations. Additionally, the IC did not promptly and accurately classify the emergencies based on the actual and potential releases of HAZMAT to determine the appropriate PAs, and did not modify PAs when the potential and simulated releases of HAZMAT became known. Also, the ERO did not adequately track the status of injured personnel.

SNL Emergency Management and SFO self-identified after the 2014 exercise that they have not fully validated their capabilities for responding to the types of severe events described in OE-1. To address these performance issues, SNL Emergency Management is implementing several significant changes to the site emergency plan and response procedures, and plans to validate the new concepts and changes in the upcoming annual exercise in September 2015.

In conclusion, SFO and SNL Emergency Management have implemented a number of improvements to their program, including revising EPHAs and conducting a tabletop exercise with a severe event scenario. SNL Emergency Management and SFO self-identified that SNL/NM has not effectively validated some necessary capabilities for responding to the types of severe events described in OE-1. SNL Emergency Management is currently developing plans and procedures for responding to the types of severe events described in OE-1; these documents are also intended to address the issues identified by EA during the FY 2014 severe event exercise.

5.5 Exercise Conduct

Review Criteria:

Each exercise must be conducted and controlled effectively and reliably. (DOE Order 151.1C, paraphrased from CRAD 45-61)

For this portion of the review, EA observed the conduct of the FY 2014 severe event exercise and reviewed SNL Emergency Management after-action reports.

SNL Emergency Management effectively controlled and conducted several aspects of the FY 2014 severe event exercise. SNL Emergency Management coordinated exercise planning among onsite and offsite organizations and adequately provided for exercise initiation, interruption, and termination. Controllers permitted free play among the responders when free play would not interfere with the scenario, and they prevented interference and prompting by non-responders. In addition, responders performed their respective functions, initially and throughout the exercise, in a professional manner as if the situation were an actual emergency. Further, SNL Emergency Management simulated activities with sufficient realism to provide confidence that those activities could have been performed during a real emergency.

However, EA noted several weaknesses in the conduct of the FY 2014 severe event exercise. Contrary to the *Emergency Management Exercise Program* procedure, the exercise-specific training that SNL Emergency Management provided to evaluators and controllers before the exercise did not include the rules of conduct or guidelines on appropriate interactions with players. SNL Emergency Management categorized this issue as a finding in the after-action report and implemented appropriate corrective actions to prevent recurrence. In addition, SNL Emergency Management gave the evaluators draft

response procedures and checklists shortly before the exercise started, with the expectation that the evaluators would use them to evaluate the players' performance, but allowed no time for the evaluators to become familiar with these draft documents. Although SNL Emergency Management revised the *Emergency Management Exercise Program* procedure in response to this issue (categorized as an observation in the after-action report), the revision did not modify the practice of changing evaluation expectations without sufficient time to prepare the evaluators. Further, six trusted agents participated as players in the exercise, including three in key decision-making roles (EOC Manager, Telecommunicator Supervisor, and IC Senior Advisor); because the trusted agents had prior knowledge of the exercise scenario, the exercise was not a valid test of their performance. SNL Emergency Management did not categorize this issue as a finding or observation. SNL did not address either of these issues. (See Section 8.0, **OFI-SANDIA-8**.)

In conclusion, SNL Emergency Management effectively conducted and controlled several aspects of the FY 2014 severe event exercise, including good coordination with the participating organizations. Controllers ensured that responders were able to perform their functions without interference, and simulations were sufficiently realistic. However, SNL Emergency Management did not allow sufficient time for evaluators to become familiar with response procedures and checklists that were changed before the exercise. Further, SNL Emergency Management allowed six trusted agents to serve as players in the exercise, three in key decision-making roles. SNL Emergency Management did not categorize either of these issues as a finding or an observation.

5.6 Corrective Actions and Improvements

Review Criteria:

Lessons learned must be developed, resulting in corrective actions and improvements. (DOE Order 151.1C, paraphrased from CRAD 45-61)

5.6.1 Contractor Issues Management Process

For this portion of the review, EA reviewed the site emergency plan and contractor assurance system description, the contractor issues management procedures, and the SNL Emergency Management exercise program self-assessments.

SNL Emergency Management follows procedure NM-QA-SOP-0030, *Issues Management*, which is based on the Sandia Corporation corporate procedure CG100.6.6, *Determine and Take Action*. Collectively, these documents provide a detailed description of the contractor's process for formally resolving issues. The procedures appropriately require identification of root causes, extent-of-condition reviews, and independent verification of completion of corrective actions. SNL Emergency Management also formally tracks issues and corrective actions using the Assurance Information System.

However, the issues management process does not address several key aspects needed for effective issue resolution. The procedures provide guidance on developing corrective actions, but address recurrence prevention only as part of effectiveness reviews after corrective actions are completed, not as part of corrective action development. The procedures also do not address developing corrective action plans within 30 working days as required by DOE Order 151.1C; SNL Emergency Management self-identified this shortcoming during its FY 2015 self-assessment but categorized it only as an observation (discussed further in Section 5.6.2). The Assurance Information System requires validation that corrective actions were effective only for findings where the responsible manager elects to perform a causal analysis, contrary to the requirement in DOE Order 151.1C that contractors independently validate the effectiveness of corrective actions for all findings. Further, the *Emergency Management Exercise Program* procedure includes a process for adding exercise objectives to ensure the adequacy of corrective

actions for issues identified in previous exercises. Despite multiple findings identified by SNL Emergency Management in previous exercise after-action reports, EA found no such objectives in the 2013-2015 exercise packages. Finally, SNL Emergency Management's FY 2015 self-assessment noted the failure to validate corrective actions but did not categorize this issue as a finding or observation. (See Section 8.0, **OFI-SANDIA-9**.)

Finding F-SANDIA-2: Contrary to DOE Order 151.1C, SNL Emergency Management does not independently validate that corrective actions were effective in resolving the findings identified in exercise after-action reports.

In conclusion, SNL Emergency Management's detailed process for resolving issues includes appropriate instructions for performing causal analyses, extent-of-condition reviews, and independent verification of corrective action closure. However, the issues management procedures do not address developing corrective actions within 30 working days or independently validating that corrective actions were effective for all findings, contrary to DOE Order 151.1C requirements.

5.6.2 Contractor Corrective Actions

For this portion of the review, EA reviewed the SNL Emergency Management issues management procedure, exercise after-action reports, exercise program self-assessments, corrective actions, and closure evidence.

SNL Emergency Management has assigned reasonable due dates and completed most of the corrective actions by the assigned due dates. However, EA noted several weaknesses in implementation of the issues management process. SNL Emergency Management did not appropriately categorize some issues identified in the FY 2014 severe event exercise after-action report. SNL Emergency Management's *Issues Management* procedure states that a finding is based on the failure to meet a written requirement; however, the responsible manager categorized an issue regarding the IC's failure to provide information required by their procedures as an observation, rather than as a finding. In another case, SNL Emergency Management categorized a significant issue regarding an EPHA that contained inaccurate source term data (contrary to the requirements in DOE Order 151.1C) as an observation rather than as a finding. Further, SNL Emergency Management did not conduct a formal causal analysis for six of the seven findings in the FY 2014 severe event exercise after-action report, even though the extent-of-condition review for these findings indicated that a formal causal analysis was warranted per the *Issues Management* procedure. SNL Emergency Management's rationale for not conducting a formal causal analysis states that the findings are local in nature, but the extent-of-condition review stated that these findings impact DOE Headquarters, and local, state, and Federal organizations. The rationale also states that the findings are a first-time occurrence, but the extent-of-condition review said that similar issues have been identified before and that corrective actions did not fix them. (See Section 8.0, **OFI-SANDIA-9**.)

Additionally, SNL Emergency Management does not consistently develop corrective action plans within 30 working days as required by DOE Order 151.1C (also noted as an issue in EA's 2009 inspection report). For example, SNL Emergency Management did not develop corrective actions for a finding on the unavailability of a derivative classifier during an FY 2010 exercise until the finding recurred seven months later in an FY 2011 exercise. In another case, SNL Emergency Management took one year to develop corrective actions for a finding on the joint information center's failure to provide information to the mock media. After the FY 2014 severe event exercise, SNL Emergency Management did not develop corrective actions for the findings until five months after issuing the exercise after-action report. (See Section 8.0, **OFI-SANDIA-9**.)

Finding F-SANDIA-3: Contrary to DOE Order 151.1C, SNL Emergency Management did not develop corrective action plans within 30 working days of receipt of a final evaluation report.

SNL Emergency Management also does not always develop corrective actions that help prevent recurrence of an issue. For example, SNL Emergency Management provided briefings to ERO personnel to address a finding from an FY 2011 exercise but did not ensure that new personnel in these positions received the same information. For an observation from the FY 2014 severe event exercise involving the IC's failure to provide information for notifications, PAs, and categorization/classification, the corrective actions developed by SNL Emergency Management did not address the notification and PA aspects of the observation, though they did address revising a procedure and providing training on the categorization/classification aspect of the observation. In another case, SNL Emergency Management developed corrective actions for an observation involving inaccurate source term data in an EPHA, without including actions to implement the revised notification process for inventory changes or revise affected EPHAs. (See Section 8.0, **OFI-SANDIA-9**.)

Further, SNL Emergency Management closed some findings and corrective actions before the associated issues were resolved. For example, SNL Emergency Management closed a finding about EOC derivative classifiers after only a few of the classifiers had received the required training. In another case, SNL Emergency Management selected an alternate notification system to meet the need for continuous communications with the workforce, but closed the associated finding before the system was implemented. SNL Emergency Management also closed a corrective action to revise the emergency management plan to define roles and responsibilities for accountability and reporting the results, but did not modify the site emergency plan to include this information. (See Section 8.0, **OFI-SANDIA-9**.)

In conclusion, SNL Emergency Management assigns reasonable due dates and completes timely corrective actions. However, EA noted several weaknesses in the implementation of the issues management process, including incorrectly categorizing some issues as findings or observations and failing to conduct causal analyses for several findings. EA also noted several corrective actions that would not prevent recurrence of an issue, as well as findings and corrective actions that SNL Emergency Management closed before the underlying issues were resolved. Most importantly, SNL Emergency Management does not consistently develop corrective actions within 30 working days as required.

5.6.3 DOE Oversight and Issues Management

For this portion of the review, EA reviewed the SFO oversight and issues management procedures, emergency management program self-assessments, and assessments of the contractor exercise program.

SFO last performed a comprehensive self-assessment of its emergency management program responsibilities in early FY 2014 as part of a pre-Chief of Defense Nuclear Safety (CDNS) review and noted 22 issues. A subsequent FY 2014 CDNS review performed by the same SFO personnel identified 1 finding, 7 weaknesses, and 3 OFIs, which were part of the 22 issues previously identified. However, SFO has not assessed the overall adequacy of the SNL Emergency Management exercise program. SFO Business Management System (SBMS) procedure 0401.04, *Emergency Management Feedback*, describes a process for gathering evaluation information from SFO personnel regarding drills, exercises, and actual emergencies, providing a formal evaluation to SNL Emergency Management for action, and documenting any actions needed by SFO; however, SFO has not complied with this procedure for several years. Instead, the SFO emergency management program manager conducted performance-based assessments of SNL Emergency Management's planning, conduct, and evaluation of annual exercises in FY 2012 and FY 2013 (but not in FY 2014). However, SFO reports did not document its evaluation criteria, and SFO has not performed any other reviews of the SNL Emergency Management exercise program over the last several years. (See Section 8.0, **OFI-SFO-1**.)

SBMS procedure 0804.01.05, *SFO Issues Management*, describes the process that all SFO organizations are to use to formally resolve issues. SFO prioritizes issues into three categories based on significance and requires identification of root causes for the two most significant levels of issues and effectiveness reviews for all issues. In addition, SFO requires formal tracking of corrective actions (primarily using ePegasus – a computerized issues management tracking system) and the use of objective evidence to close corrective actions. However, the *SFO Issues Management* procedure does not provide guidance on developing effective corrective actions and preventing recurrence. (See Section 8.0, **OFI-SFO-2**.)

SFO does not use its issues management process to resolve emergency management issues. Although SFO took informal actions to resolve some of the issues identified during its self-assessments, SFO did not enter the issues into ePegasus or perform a root cause analysis. Also, contrary to DOE Order 151.1C, SFO did not develop corrective actions within 30 working days for the finding and seven weaknesses from the FY 2014 CDNS review. These issues included weaknesses in the training and drills for the SFO representative in the EOC, SFO's lack of participation in the DOE/NNSA lessons-learned program, and the lack of performance metrics that verify SNL Emergency Management's performance. At the time of this EA review, these issues remained unresolved. (See Section 8.0, **OFI-SFO-2**.)

Finding F-SFO-1: Contrary to DOE Order 151.1C, SFO did not develop corrective action plans within 30 working days of receipt of a final evaluation report.

In conclusion, SFO has conducted a comprehensive self-assessment of its emergency management program responsibilities and several performance-based assessments of the SNL Emergency Management exercise program. However, SFO does not perform comprehensive assessments of the contractor exercise program. SFO also does not document its evaluation criteria in its contractor assessment reports. Further, SFO does not use its issues management process to resolve emergency management issues that require SFO action. Finally, contrary to DOE Order 151.1C, SFO has not yet developed corrective actions for one finding and seven weaknesses from an FY 2014 CDNS review, and these issues remain unresolved.

5.7 Lessons Learned

Review Criteria:

Lessons learned must be developed, resulting in corrective actions and improvements. (DOE Order 151.1C, paraphrased from CRAD 45-61)

For this portion of the review, EA reviewed the Sandia Corporation and SFO lessons-learned program documents and after-action reports from exercises during the past five years.

SNL Emergency Management makes minimal use of site and DOE/NNSA corporate lessons-learned programs relative to emergency management. DOE Order 151.1C requires the readiness assurance program to include a system for incorporating and tracking lessons learned from training, drills and exercises, actual event responses, and a sitewide lessons-learned program. Additionally, the site must participate in the DOE/NNSA corporate lessons-learned program. SNL Emergency Management has documented its emergency management lessons-learned program in procedure NM-PA-CAR-3.2, *Emergency Management Lessons Learned*, which requires any lessons learned from exercises to be developed in accordance with the procedure. However, there is no evidence or documentation demonstrating that exercises have identified any emergency management lessons learned during the last five years. In addition, over the past five years, SNL Emergency Management has contributed only one emergency management lesson learned to the site lessons-learned program and nothing to the DOE/NNSA corporate lessons-learned program. Furthermore, annual ERO refresher training lacks a

summary of lessons learned from the previous year. Consequently, most SNL/NM ERO members do not receive emergency management-related lessons learned. (See Section 8.0, **OFI-SANDIA-10**.)

Likewise, SFO makes minimal use of site and DOE/NNSA corporate lessons-learned programs relative to emergency management. SFO has documented lessons-learned program roles and responsibilities in procedure SBMS 1303.04, *Lessons Learned*. However, SFO self-identified that it had not submitted any emergency management lessons learned during the last five years. Furthermore, the FY 2014 CDNS review identified that there was no evidence or documentation demonstrating that the SFO has consistently participated in the DOE/NNSA corporate lessons-learned program related to emergency management. (See Section 8.0, **OFI-SFO-3**.)

In conclusion, there is no evidence or documentation to demonstrate that exercises have identified any emergency management lessons learned during the last five years. In addition, SNL Emergency Management and SFO make minimal use of the external emergency management lessons learned that are available through the DOE/NNSA corporate lessons-learned program.

6.0 CONCLUSIONS

SNL Emergency Management has adequately incorporated the order requirements into the exercise program. SNL Emergency Management appropriately documents the exercise program description and implementing processes, including the processes used to design, develop, conduct, evaluate, and document emergency management exercises. SNL Emergency Management also uses a structured process for evaluating exercises, prepares in-depth after-action reports that list issues noted during the exercise, assigns reasonable due dates, and completes timely corrective actions. In addition, SNL Emergency Management has enhanced its ability to respond to a severe event. Sandia Corporation has a detailed process for resolving issues that includes appropriate instructions for performing causal analyses, extent-of-condition reviews, and independent verification of corrective action closure. SFO conducted a comprehensive self-assessment of its emergency management program responsibilities and several performance-based assessments of the SNL Emergency Management exercise program.

However, EA identified weaknesses in SNL Emergency Management's and SFO's implementation of the emergency exercise and issues management programs:

- In the area of evaluation and validation, EEGs do not include observable and measurable evaluation criteria for each objective that would promote an objective evaluation of responder performance, so exercise evaluators rely heavily on their experience in recognizing ERO performance issues. SNL Emergency Management also does not adequately confirm the ability to shelter, evacuate, and account for personnel because evaluated drills are not used to validate some parts of the site emergency management program. In addition, SNL Emergency Management allowed six trusted agents to also act as exercise players, with three in key decision-making roles, thereby invalidating their portion of the exercise evaluation. Finally, SNL Emergency Management has not validated planning for some important elements of the emergency management program, such as responding to HAZMAT release scenarios for bounding events, utilizing alternate command centers, or implementing response plans for large fires in HAZMAT facilities. With regard to Federal oversight, SFO does not perform comprehensive assessments of the contractor exercise program.
- In the area of program improvement, SNL Emergency Management and SFO self-identified that SNL/NM has not effectively validated some necessary capabilities for responding to the types of severe events described in OE-1, and EA identified additional weaknesses in this area. SNL Emergency Management procedures do not address developing corrective actions within 30

working days or independently validating the effectiveness of corrective actions for all findings. EA noted several weaknesses in the implementation of the issues management process, including incorrectly categorizing some issues as findings or observations and failing to conduct causal analyses for several findings. EA also noted several corrective actions that would not prevent recurrence of an issue, and SNL Emergency Management closed some findings and corrective actions before the underlying issues were resolved. Both SFO and SNL Emergency Management make minimal use of lessons-learned systems. SFO also had several deficiencies in the area of program improvement in that SFO does not use its issues management process to resolve emergency management issues that require SFO action and did not develop corrective actions for one finding and seven weaknesses from an FY 2014 CDNS review, which remain unresolved.

- In the area of program documentation, SNL Emergency Management does not always take corrective actions to resolve ERO performance issues noted by evaluators. SFO does not document its evaluation criteria in its contractor assessment reports.

Overall, the Sandia Corporation and SFO have adequately documented the processes for exercise planning and evaluation, as well as for issues management. However, EA noted weaknesses that result in the exercise program and corrective action process having limited effectiveness in accomplishing stated program objectives. The absence of evaluation criteria for exercise objectives, timely corrective actions, and independent validation that corrective actions were effective have decreased the effectiveness of these components of the emergency management program.

7.0 FINDINGS

As defined in DOE Order 227.1, findings are significant deficiencies or safety issues that warrant a high level of attention from management. If left uncorrected, findings could adversely affect the DOE mission, the environment, the safety or health of workers and the public, or national security. Findings may identify aspects of a program that do not meet the intent of DOE policy or Federal regulation. CAPs must be developed and implemented for EA appraisal findings. Cognizant DOE managers must use site- and program-specific issues management processes and systems developed in accordance with DOE Order 227.1 to manage these CAPs and track them to completion.

NNSA Sandia Field Office

Finding F-SFO-1: Contrary to DOE Order 151.1C, SFO did not develop corrective action plans within 30 working days of receipt of a final evaluation report.

SFO did not develop corrective actions within 30 working days for the finding and seven weaknesses from an FY 2014 CDNS review as required. These issues remain unresolved.

Sandia Corporation

Finding F-SANDIA-1: Contrary to DOE Order 151.1C, SNL Emergency Management does not provide evaluation criteria for each exercise objective.

SNL Emergency Management does not provide evaluation criteria for each exercise objective as required by DOE Order 151.1C. The EEGs do not facilitate an objective evaluation by including evaluation criteria with observable and measurable response steps the responders must perform to demonstrate successful performance of the objective. Instead, SNL Emergency Management relies on evaluators' subjective determination of whether responders successfully accomplished an objective.

Finding F-SANDIA-2: Contrary to DOE Order 151.1C, SNL Emergency Management does not independently validate that corrective actions were effective in resolving the findings identified in exercise after-action reports.

The issues management procedures require independent validation that corrective actions were effective only when the responsible manager elects to do a causal analysis, rather than for all exercise after-action report findings as required by DOE Order 151.1C. EA found that SNL Emergency Management typically decides against doing a causal analysis for findings. EA also noted several examples where the corrective actions would not prevent recurrence or where SNL Emergency Management closed some findings before the underlying issues were adequately resolved.

Finding F-SANDIA-3: Contrary to DOE Order 151.1C, SNL Emergency Management did not develop corrective action plans within 30 working days of receipt of a final evaluation report.

SNL Emergency Management did not develop corrective actions within 30 working days for several findings from previous exercise after-action reports as required. These findings remained unresolved from several months to up to a year after the exercise after-action reports were published before SNL Emergency Management developed corrective actions.

8.0 OPPORTUNITIES FOR IMPROVEMENT

This EA review identified 13 OFIs. These potential enhancements 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 minor issues identified during the conduct of the review. In some cases, OFIs address areas where program or process improvements can be achieved through minimal effort. It is expected that the responsible line management organizations will evaluate these OFIs and accept, reject, or modify them as appropriate, in accordance with site-specific program objectives and priorities.

NNSA Sandia Field Office

OFI-SFO-1: Consider enhancing SFO's oversight of the SNL Emergency Management exercise program by:

- Documenting evaluation criteria used to determine performance in contractor assessment reports
- Periodically conducting comprehensive, compliance-based assessments of the SNL Emergency Management exercise program.

OFI-SFO-2: Consider improving the resolution of SFO emergency management issues by:

- Ensuring that corrective actions result in an implemented solution for the issue and prevent recurrence of the issue
- Entering unresolved emergency management issues into ePegasus
- Developing timely corrective actions for emergency management issues and documenting these actions in ePegasus.

OFI-SFO-3: Enhance continuous improvement derived from the lessons-learned program by:

- Using the SFO lessons-learned program to send appropriate emergency management related information to the SFO ERO

- Sharing emergency management lessons learned between SFO functional groups, including performance weaknesses with cross-cutting or common issues requiring corrective action
- Effectively participating in the DOE/NNSA corporate lessons-learned program related to emergency management issues.

Sandia Corporation

OFI-SANDIA-1: Consider making the *Six-Year Exercise Scheduling Plan* a formal document and part of the annual emergency readiness assurance plan, as required by the site emergency plan.

OFI-SANDIA-2: Consider providing offsite response organizations with a formal invitation that requests their participation in SNL/NM exercises.

OFI-SANDIA-3: Consider improving the site's ability to recognize response implementation issues and hold responders accountable for adhering to approved plans and procedures by:

- Fully implementing a DOE-produced computer-based tool, *Exercise Builder*, for developing emergency exercises; this tool enables the generation of consistent and detailed exercise plan documents using Microsoft Word-based customizable templates
- Implementing *Exercise Builder* for both exercises and emergency management drills, delineating the individual component requirements for development of a drill or exercise plan
- Developing a complete baseline of ERO and response organization objectives, response steps, and evaluation checklists and criteria
- Ensuring that each drill or exercise objective has associated evaluator information that includes the stated objective, the applicable evaluation criteria selected from the DOE emergency management guide, and an evaluator checklist
- Providing a verbatim reference from the applicable Sandia Corporation plan or procedure for each evaluation criterion in the EEG
- Updating the EEGs after each change in emergency response plans and procedures
- Ensuring that organizations responsible for completing the evaluation criteria have concurred with the EEGs.

OFI-SANDIA-4: Consider improving the *Emergency Management Exercise Program* procedure and the site emergency plan by:

- Incorporating the DOE Guide 151-1.3 definitions for exercise deficiencies and weaknesses
- Adding evaluated drills to validate parts of the site emergency management program, such as during PA drills
- Adding a validation process to assess actual responses using exercise evaluation criteria, documented in a final emergency report.

OFI-SANDIA-5: Consider expanding exercise planning by including scenarios with bounding HAZMAT consequences and testing such aspects as alternate ERO facilities, PAs, and offsite medical treatment planning.

OFI-SANDIA-6: Consider improving the exercise evaluation process by:

- Providing controllers and evaluators with a written copy of the rules of conduct and guidelines for interactions with players

- Adding objectives to each exercise package that evaluate whether emergency response facilities and equipment are readily available, operational, and habitable and whether emergency response procedures provide adequate content for responders
- Modifying the EEGs to allow evaluators to rate an objective as not met.

OFI-SANDIA-7: Consider revising requirements for after-action reports to include requirements for:

- Increasing the attention given to evaluator comments that indicate ERO performance issues during exercises
- Categorizing all issues in the after-action report as findings or observations
- Including recommended corrective actions for all issues identified in the report.

OFI-SANDIA-8: Consider modifying the conduct and control of exercises by:

- Instituting a deadline after which no further changes can be made to responder procedures before an exercise
- Prohibiting the use of trusted agents as players in key decision-making roles during the exercise.

OFI-SANDIA-9: Consider revising the SNL Emergency Management issues management process to include requirements for:

- Categorizing issues noted in exercise after-action reports using the definitions for observations and findings provided in the *Issues Management* procedure
- Performing a causal analysis for all findings
- Developing corrective actions within 30 working days after publication of an exercise after-action report
- Ensuring that corrective actions result in an implemented solution for the issue and prevent recurrence of the issue
- Fully completing all corrective actions associated with an issue before closure
- Independently validating that corrective actions were effective for all findings.

OFI-SANDIA-10: Enhance continuous improvement derived from the lessons-learned program by:

- Using the Sandia Corporation lessons-learned program to send appropriate emergency management related information to the SNL/NM ERO
- Sharing emergency management lessons learned between Sandia Corporation functional groups, including performance weaknesses with cross-cutting or common issues requiring corrective action
- Effectively participating in the DOE/NNSA corporate lessons-learned program related to emergency management issues
- Including emergency management related lessons learned from the previous year in the annual ERO refresher training.

Appendix A Supplemental Information

Dates of Review

Onsite Review: May 5 – June 4, 2015

Office of Enterprise Assessments

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

Quality Review Board

William A. Eckroade
John S. Boulden III
Thomas R. Staker
Karen L. Boardman
Michael A. Kilpatrick

Enterprise Assessments Site Lead

William A. Macon

Enterprise Assessments Reviewers

Randy Griffin – Lead
John Bolling
Teri Lachman

Appendix B

Key Documents Reviewed and Interviews

Key Documents Reviewed

- CG100.6.6, *Determine and Take Action*, 4/16/15
- NM-EM-PLAN-01, *SNL/NM-Tonopah Test Range Emergency Plan*, Rev. 2, 4/8/13
- NM-EX-PD-01, *Emergency Management Exercise Program*, Rev. 8, 5/1/15
- NM-PA-CAR-3.2, *Emergency Management Lessons Learned*, Rev. 4, 3/22/09
- NM-PA-CAR-3.3, *Incident/Event Feedback and Improvement Hotwashes and Critiques*, Rev. 2, 4/10/13
- NM-QA-SOP-0030, *Issues Management*, Rev. 5, 3/15/15
- SBMS 0401.04, *Emergency Management Feedback*, Rev. 1, 2/22/11
- SBMS 0804.01.05, *SFO Issues Management*, Rev. 1, 1/15
- SBMS 1303.04, *Lessons Learned*, Rev. 5, 1/8/14
- *Six-Year Exercise Scheduling Plan*, undated

Interviews

- Sandia Corporation SNL Emergency Management Manager
- Sandia Corporation SNL Emergency Management Performance Assurance Lead
- Sandia Corporation SNL Emergency Management Planning and Support Team Lead
- Sandia Corporation SNL Emergency Management Program Administration Team Lead
- Sandia Corporation SNL Emergency Planner (Exercises)
- Sandia Corporation Security and Emergency Management Assurance Team Lead
- Sandia Corporation Security and Emergency Management Corrective Actions Management Lead
- SFO Emergency Management Program Manager