

**Office of Enterprise Assessments
Assessment of the Emergency Management
Exercise Program at the Idaho Site**



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Acronyms

AAR	After-Action Report
AMWTP	Advanced Mixed Waste Treatment Project
BEA	Battelle Energy Alliance, LLC
C/E	Controller/Evaluator
CFA	Central Facilities Area
CRAD	Criteria and Review Approach Document
CRD	Contractor Requirements Document
DOE	U.S. Department of Energy
DOE-ID	DOE Idaho Operations Office
EA	Office of Enterprise Assessments
EAL	Emergency Action Level
EAM	Emergency Action Manager
ECC	Emergency Control Center
ED	Emergency Director
EEG	Exercise Evaluation Guide
EM	Office of Environmental Management
EMG	Emergency Management Guide
EOC	Emergency Operations Center
EPHA	Emergency Planning Hazards Assessments
ERAP	Emergency Readiness Assurance Plan
ERO	Emergency Response Organization
FMT	Facility Monitoring Team
FSE	Full-Scale Exercise
IC	Incident Commander
ICP	Idaho Cleanup Project
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
ISC	Interim Storage Container
IWTS	Integrated Waste Tracking System
JIC	Joint Information Center
NA-40	National Nuclear Security Administration Office of Emergency Operations
NE	Office of Nuclear Energy
NRC	U.S. Nuclear Regulatory Commission
OFI	Opportunity for Improvement
OSC	On-Scene Communicator
PA	Protective Action
PAC	Protective Action Criteria
RCT	Radiological Control Technician
RWMC	Radioactive Waste Management Complex
SAE	Site Area Emergency
TRU	Transuranic
WCC	Warning Communications Center

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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 at the Idaho Site from July 25 to September 29, 2017. The purpose was to evaluate the Battelle Energy Alliance, LLC (BEA) and Fluor Idaho, LLC emergency management exercise programs and the DOE Idaho Operations Office's (DOE-ID) oversight of the site's emergency management program. Fluor Idaho is the managing and operating contractor for the Idaho Cleanup Project (ICP) Core facilities. BEA is the managing and operating contractor for the Idaho National Laboratory (INL) and provides site-wide fire and protective force services.

EA reviewed the contractors' emergency plans, exercise guides, five-year exercise plans, exercise evaluation objectives and criteria, exercise plans, after-action reports, evacuation and accountability exercises, and supporting exercises from the past five years. Additionally, EA observed Fluor Idaho's annual full-scale exercise to assess the overall performance of the exercise program. EA also reviewed DOE-ID assessment plans and assessment reports from the past three years and followed up on the finding issued during EA's 2012 assessment, which EA found to be properly closed.

EA concluded that in most respects, BEA and Fluor Idaho have effectively implemented well-structured exercise programs. Importantly, Fluor Idaho and BEA have different concepts of operation and separate emergency plans to deal with individual ICP and INL events. Nevertheless, the Fluor Idaho exercise program has not established and implemented a validation process to demonstrate how the Fluor Idaho response is adequately integrated with the site-level response provided by BEA. Fluor Idaho appropriately recognized the unsatisfactory performance of response and support elements in the exercise. The Fluor Idaho after-action report noted that BEA and Fluor Idaho should consider having all parties evaluate their performance at joint evaluated exercises. However, Fluor Idaho did not identify the overarching issue of an inadequate full-scale exercise process.

EA observed two best practices during the exercise. First, BEA's effective use of a telephone bridge line and public-address system in the emergency operations center (EOC) significantly enhanced situational awareness in the EOC. In addition, BEA used an integrated web-based geographical information system, iMAP, to provide maps, data, and analysis tools for the site and environs. EA also identified some deficiencies in the BEA and Fluor Idaho exercise program and noted potential improvements for enhancing specific procedures or checklists.

DOE-ID has an effective program for assessing implementation of the DOE emergency management directives and policy; its use of a self-assessment guide is a strength. The self-assessment guide provides instructions for the assessment team and serves as a record of results, once completed. DOE-ID also has an effective corrective action program, with adequate oversight of contractor corrective actions.

Office of Enterprise Assessments
Assessment of the Emergency Management Exercise Program at the Idaho Site

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 emergency management program at the Idaho Site to determine the program's effectiveness in providing assurance that emergency plans, implementing procedures, and resources are adequate and sufficiently maintained, exercised, and evaluated, and that improvements are made in response to identified needs, as required by DOE Order 151.1C, *Comprehensive Emergency Management System*. EA performed this assessment at the Idaho Site from July 25 to September 29, 2017.

2.0 SCOPE

EA assessed the effectiveness of the Idaho Site contractors' implementation of the emergency management exercise program and the DOE Idaho Operations Office (DOE-ID) implementation of its readiness assurance program. The three major components of a comprehensive readiness assurance program are evaluations, improvements, and an emergency readiness assurance plan (ERAP). The "Idaho Site" in this report designates the efforts or programs of all contractors in Idaho for which DOE-ID has oversight responsibilities. DOE-ID and site contractors each have a role in implementing the Idaho Site exercise and readiness assurance programs through a series of evaluations, improvement actions, and ERAPs. Exercise evaluations assess response performance against response plans and procedures. EA assessed the conduct of the August 9, 2017, Idaho Cleanup Project (ICP) Core full-scale exercise (FSE), directed by Fluor Idaho, LLC (Fluor Idaho), and reviewed the FSE after-action report (AAR). EA evaluators were located at the onsite Idaho Nuclear Technology and Engineering Center (INTEC) emergency control center (ECC), the INTEC event scene, and the offsite Idaho National Laboratory (INL) emergency operations center (EOC) to assess the FSE. Battelle Energy Alliance, LLC (BEA) provided site-level response support to Fluor in this exercise, but BEA and Fluor had different understandings as to whether that would be an evaluated element during the exercise. In addition, EA assessed the exercise program activities that DOE-ID and site contractors (Fluor Idaho and BEA) conducted over the past five years, specifically looking at the oversight function, exercise evaluations, corrective action implementation, lessons learned, and readiness assurance plans assigned to each organization within the Idaho Site emergency management program. EA also assessed the closure of a finding from its previous visit, which was a review of severe event preparedness consistent with the DOE bulletin Operating Experience Level-1, *Improving DOE Capabilities for Mitigating Beyond Design Basis Events*, which incorporated lessons learned from the 2011 tsunami event at the Fukushima reactors in Japan.

3.0 BACKGROUND

DOE-ID has oversight and contractual responsibility for the INL and the ICP. DOE-ID combined the Advanced Mixed Waste Treatment Project (AMWTP), the Radioactive Waste Management Complex (RWMC), and INTEC into a new ICP contract in June 2016, with Fluor Idaho managing the ICP. The Office of Environmental Management (EM) provides funding and programmatic requirements for the work at the ICP, while the Office of Nuclear Energy (NE) provides funding and programmatic requirements for the rest of the work at the Idaho Site.

DOE-ID has three current contractors that carry out the work:

- BEA – INL contractor
- Fluor Idaho, LLC – ICP contractor since June 1, 2016
- Spectra Tech, Inc. – U.S. Nuclear Regulatory Commission (NRC)-licensed facilities contractor since April 1, 2016.

BEA and Fluor Idaho operate hazardous material programs as defined by DOE Order 151.1C. In addition to providing its own emergency management program, BEA also manages and operates some of the site-level response functions, such as the INL EOC, INL consequence assessment, ambulance, fire department, and security used by Fluor Idaho and Spectra Tech, along with associated facilities and equipment.

Fluor Idaho implements its own emergency management program for the ICP facilities with support from BEA. Fluor Idaho contracted with BEA to provide specific emergency management services, such as consequence assessment, external liaison, EOC support, and other logistic functions through a Blanket Master Agreement. In addition to specific emergency management services, the Blanket Master Agreement describes other services, such as fire protection, medical, and security, that BEA provides to Fluor Idaho. Fluor Idaho has made progress in merging the emergency management programs of previous contractors, but refinement is ongoing. The August 2017 FSE was the first validation test of the Fluor Idaho emergency management program and concepts at the INTEC facility.

Spectra Tech, Inc. is responsible for emergency management at two independent spent fuel storage installations, but operates under NRC regulations and is not part of the DOE Order 151.1C programs. Fluor Idaho and BEA appropriately consider the NRC facilities and their hazards in their emergency management programs.

4.0 METHODOLOGY

DOE Order 227.1A, *Independent Oversight Program*, describes and governs the DOE independent oversight program. EA implements this 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. Appendix C summarizes other important deficiencies not meeting the criteria for a finding highlighted in the report. These deficiencies should be addressed consistent with site-specific issues management procedures.

EA performed this assessment in accordance with EA’s *Plan for the Office of Enterprise Assessments Assessment of the Exercise Program and Federal Oversight Assessment of Emergency Management at the Idaho National Laboratory*, July – October 2017, and two criteria and review approach documents (CRADs): EA CRAD EA-33-05, *Contractor Readiness Assurance and Exercise Program CRAD*, and EA CRAD EA-33-06, *Federal Line Management Oversight of the Field Emergency Management Program CRAD*. Since this was a performance and programmatic review, EA observed responder and controller/evaluator (C/E) performance during the FSE, reviewed documents and databases, and interviewed key personnel to collect data and draw conclusions. EA determined the effectiveness of the readiness assurance program using the National Nuclear Security Administration’s Office of Emergency Operations (NA-40) definition of an effective program in DOE Emergency Management Guide (EMG) 151.1-3; this guide establishes performance goals for all 15 emergency management program elements and provides a comprehensive set of performance-based criteria for meeting the performance goals. The

criteria are designated for use in programmatic and exercise evaluations. The EMG describes an effective readiness assurance program as a comprehensive system that includes both evaluation techniques and a system for incorporating and tracking lessons learned from training, drills, and actual responses, along with a sitewide lessons-learned program.

The members of the EA assessment team, the Quality Review Board, and EA management responsible for this assessment are listed in Appendix A. A detailed list of the documents reviewed and personnel interviewed, relevant to the findings and outcomes of this report, is provided in Appendix B.

5.0 RESULTS

5.1 Full-Scale Exercise

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, timelines, injects, controller instructions, and evaluation criteria for realistic scenarios. Exercises are conducted, controlled, evaluated, and critiqued effectively and reliably. (Paraphrased from DOE Order 151.1C)

EA assessed the conduct of the August 2017 FSE and reviewed the Fluor Idaho August 2017 FSE AAR. In addition, EA used the FSE evaluation activities (e.g., the planned evaluation criteria; use of hotwashes, critiques, and exercise evaluation guides; and the AAR results) to draw conclusions about the effectiveness and reliability of Fluor Idaho's evaluations. EA also assessed Fluor Idaho's implementing practices against its exercise program documents, including the August 2017 FSE plan, emergency plans, and implementing procedures.

The FSE is the most complex of the operations-based exercises defined under DOE Order 151.1C. Fluor Idaho designed the August 2017 FSE to test many aspects of an integrated emergency response and planned exercise events through a scripted exercise scenario with built-in flexibility to allow updates to drive activity. Fluor Idaho first responders and resources were mobilized and deployed to the scene, where they conducted their actions, as nearly as possible, as if a real incident had occurred.

This FSE scenario involved two injured workers, a potential breach of two interim storage containers (ISCs), and some other wind damage from a tornado at INTEC. An ISC is a concrete container located outside and above ground that can store up to four transuranic (TRU) waste drums. In the exercise scenario, the ISCs remained intact. However, the potential for release of TRU material from the ISC resulted in the need to implement additional protective measures and the activation of both facility-level and site-level emergency response organizations (EROs).

Fluor Idaho adequately designed the August 2017 FSE in accordance with GDE-467, *Emergency Drills and Exercises* ("exercise guide" in this report). In addition, the August 2017 FSE was planned to trigger implementation of BEA emergency management support under the Blanket Master Agreement with Fluor Idaho. The Blanket Master Agreement (commonly referred to as the statement of work) provides support to Fluor Idaho with the BEA-managed EOC and Central Facilities Area (CFA) ECC for ten Fluor Idaho emergency management drills and two exercises each fiscal year. Support for drills is in the form of control cells (staffed with role players) for the EOC and CFA ECC. For the August 2017 FSE, Fluor Idaho requested BEA to activate and staff the EOC, the warning communications center (WCC), and the

event scene with qualified ERO personnel to validate interfaces between Fluor Idaho and BEA personnel. BEA personnel in the WCC make notifications to offsite authorities.

Fluor Idaho conducted the August 2017 FSE in a manner that enabled EA to evaluate elements of the ICP emergency management program by initiating a response to simulated, realistic emergency events and conditions in a manner that, as nearly as possible, replicated an integrated emergency response to an actual event. Fluor Idaho's planning and preparation for the August 2017 FSE used a structured approach that included specific objectives, scope, timelines, injects, and controller instructions for a realistic scenario. DOE-ID appropriately documented its concurrence with the exercise package.

Importantly, Fluor Idaho designed the August 2017 FSE as an evaluated exercise to validate elements of its emergency management program; accordingly, Fluor Idaho appropriately instructed controllers not to prompt or correct participants in completing their performance functions. However, if (after a reasonable time period) a participant's inaction or actions interfered with the exercise scenario or prevented other players from achieving their exercise objectives, the controllers, with concurrence from the exercise director or lead controller, were authorized to provide a contingency inject to prompt the correct action and maintain exercise continuity. The August 2017 FSE was intended to validate many response elements of the Fluor Idaho emergency management program, including integration of Fluor Idaho facility-level response with BEA. BEA's participation in the August 2017 FSE (WCC, EOC, and event scene) was not for validation of program elements; Fluor Idaho stated that it was not its intent for BEA to participate in the FSE as a drill for training BEA responders. EA evaluated the Fluor Idaho response and provided observations on the BEA participation.

Although Fluor Idaho intended the FSE to validate many response elements of its emergency management program, the FSE did not validate integration of the Fluor Idaho facility-level response with the BEA site-level response (see Section 5.2.1).

5.1.1 INTEC On-Scene

Upon notification of the event, the BEA fire department responded quickly with two ambulances, a fire engine, and a command vehicle and with the appropriate number of responders. Responders immediately located, treated, and evacuated the injured personnel. The fire department captain established himself as the Incident Commander (IC) and appropriately placed the priority on the injured personnel. After the injured personnel were evacuated, the IC correctly shifted his priority to the status of accountability, the determination of whether additional personnel were injured, and an initial damage assessment at the scene. The fire department conducted a visual damage assessment to the south of the location of the injured personnel and quickly identified a damaged low level radiological waste facility, as well as a debris field in the middle of Birch Avenue. They continued their damage assessment to the south by traveling in vehicles and identified a breached ISC located at Interim Storage Area 3. The fire department battalion chief relieved the captain as the IC after the breached ISC was identified.

Fluor Idaho evaluated their On-Scene Communicator (OSC), two Radiological Control Technicians (RCTs), and a Facility Monitoring Team (FMT). The RCTs reported to the incident command post, and the FMT conducted field monitoring in the area.

Fluor Idaho appropriately noted a number of issues during the exercise and AAR. Fluor Idaho found the on-scene command and control to be weak and therefore conducted additional training for the OSC and operations manager shortly after the FSE. Issues identified by Fluor Idaho with response performance or exercise control included:

- The OSC could not establish initial communications with the IC and did not report to the IC for 39 minutes after ERO activation because of incompatible radios and poor cellular coverage.

- Once at the scene, the OSC and the IC did not communicate effectively. The IC reported to the OSC that an exclusion zone of 100 feet was established, but the OSC did not repeat this information back and reported to the ECC that the exclusion zone was 100 meters.
- The OSC did not know how to determine ownership of and accountability for the damaged area and required the Fluor Idaho OSC controller to provide this information.
- The IC offered water to the responders at the incident command post without regard to radiological conditions.
- The Fluor Idaho on-scene controller did not remain close enough to the injured personnel to stop them from reporting their injuries prematurely (ten minutes) and not in the planned location, resulting in initial confusion, premature dispatching of the fire department, and unnecessary additional work for the exercise director.
- The Fluor Idaho on-scene controller informed the newly arrived RCT's at the incident command post that their readings were background without them earning this information.

The issues at the scene prevented validation of some processes and procedures. When the fire department surveyed 30 meters from the low level radioactive waste debris field on Birch Avenue, the controller gave an inaccurate value of 0.7 mr/hr, as if this was the location of the breached ISC. Furthermore, the photo used to convey breached ISC information contained incomplete information. Finally, Fluor Idaho controllers provided numerous injects to prompt responder actions. As the Fluor Idaho evaluator noted, when the IC offered water to all of the responders at the incident command post, Fluor Idaho controllers promptly stated that eating and drinking were not allowed, without determining whether the RCTs at the incident command post would have prevented this activity. While the IC may have offered the water in the interest of safety, the RCTs did not speak up about the responder's lack of sensitivity to potential radiological conditions.

EA observed several other weaknesses. An overreliance on simulation inhibited validation of some processes and procedures. For example, the fire department simulated issuing personal electronic dosimeters and did not develop a written incident action plan as required by EPI-64, *Incident Command on the INL*. Furthermore, at no time during the event was habitability monitoring conducted or simulated at the incident command post.

In addition, field responders did not maintain situational awareness and a common operating picture of response activities, including field responders' proximity to the hazard. For example, following the identification of the breached ISC, the incident command post remained within 35 meters of the breach for a total of 46 minutes, 15 minutes of which were within 15 meters and downwind of the breached ISC. The RCTs had not yet reported to the incident command post, and at no time during the event did the IC or RCTs at the incident command post request protective actions (PAs). The IC did not provide the 0.7 mr/hr field reading until the recovery/re-entry brief near the end of the exercise, and then only when asked. The Emergency Action Manager (EAM) ordered the IC to relocate to the north but did not give a distance. The OSC stated that the relocation was due to a wind shift, but the IC had already known for 31 minutes that the wind was from the northerly direction. The IC relocated to the intersection of Ponderosa Street and Birch Avenue, approximately 100 meters north of the breached ISC and within the 320-meter radius identified for non-essential personnel to shelter in place. The incident command post remained at this location, without air monitoring capability, until the end of the exercise.

5.1.2 INTEC Emergency Control Center

Fluor Idaho has upgraded the INTEC ECC with additional wall monitors, whiteboards, and communication equipment, providing numerous operational improvements. The INTEC ECC staff made use of these upgrades, validating the changes during the exercise.

During the August 2017 FSE, the INTEC ECC cadre appropriately responded and fully staffed the ECC with an EAM, an operations manager, a planning manager, a support manager, a planning communicator, a notification specialist, and an information management coordinator. INTEC ECC staff participated in the August 2017 FSE with the intention of validating emergency response capabilities, plans, and procedures. The EAM appropriately used the correct emergency action levels (EALs) to categorize the tornado conditions as an Operational Emergency and then classify the breached ISC as a Site Area Emergency (SAE) in a timely manner. Likewise, the EAM generated offsite notification forms and transmitted the forms to the WCC for further distribution. The EAM appropriately focused on protecting employee health and safety by initially sheltering all personnel at INTEC due to the tornado warning, obtaining accountability, and delaying activation of the ERO until the severe weather threat expired. The PAs listed in the breached ISC EAL required an evacuation out to 100 meters from the release and sheltering in place, or evacuating if possible, for personnel up to 320 meters away. The EAM decided to evacuate all non-essential personnel at INTEC, conservatively going beyond a 320-meter radius from the potential release. Although the responders simulated the evacuation, the implementation included key elements for a safe evacuation, such as coordinating with the CFA ECC, determining safe and effective employee evacuation routes, and monitoring personnel for contamination. The EAM continually ensured ECC command and control, required repeat-backs of taskings, and conducted routine briefings within the ECC. The planning manager and technical support team developed a detailed reentry plan based on priorities approved by the EAM at the onset of the planning. The planning manager, supported by the technical support specialist, led the reentry team briefing before its simulated deployment.

However, Fluor Idaho did not establish and maintain adequate communications among the ECC, event scene, WCC, and EOC. The assistant EAM and support manager, in coordination with the WCC, completed three of the five offsite notification forms late. The planning manager did not provide the EOC consequence assessment team with the radioactive inventories for the breached ISC or the field monitoring results for developing and confirming plume plots. The EAM was initially confused about the worst-case plume plot provided by the EOC consequence assessment team because it indicated committed dose beyond the INTEC boundary. After discussions with the BEA Emergency Director (ED), the EAM appropriately based future decisions on downwind continuous air monitoring and field monitoring results. The information management personnel did not record response information in WebEOC (a Web-based crisis management information system), such as ECC priorities and actions that were on ECC marker boards, to provide key information to other emergency facilities. The operations manager and OSC experienced communication issues due to poor cellular coverage and incompatible radios.

The Fluor Idaho AAR for the August 2017 FSE identified the positive aspects of the response and most of the key weaknesses discussed above. Nonetheless, the Fluor Idaho evaluation did not identify two important weaknesses related to responder health and safety.

The ECC cadre did not maintain situational awareness and a common operating picture of field responders' activities and their proximity to the hazard as required by DOE Order 151.1C. Although some individual ECC cadre members knew some of the field responders' locations, the ECC cadre did not collectively record and integrate the activities at the scene. The ECC had no map showing the location of the breached ISC, incident command post, staging area, monitoring sites, or the security personnel providing access control. Furthermore, the EAM did not clearly establish the geographical areas of responsibility between the EAM and IC, leading to uncertainty about the impact of decisions made for areas near the event. Finally, during a reentry planning meeting with technical support center personnel, the planning manager realized that the incident command post was downwind of the breached ISC and immediately asked the EAM to direct the IC to move personnel north of the potential release. The ECC cadre lacked situational awareness and a common operating picture of the field response activities because they did not fully understand field responders' locations and activities, placing the field responders downwind and within the potentially hazardous environment (see **OFI-Fluor Idaho-1**).

Also, the ECC cadre did not adequately communicate the event-specific hazards to the field responders as required by DOE Order 151.1C. Instead, the EAM issued a 100-meter exclusion zone notice to essential personnel, security and fire department field responders, although the distance to protective action criteria (PAC) was 320 meters, based on the EAL used by the EAM. Consequently, security and fire department personnel were not aware of the potentially hazardous environment boundaries or the distance to PAC, where appropriate personal protective equipment or air monitoring would be required for safe entry into the area. The ECC cadre did not communicate the hazards associated with the breached ISC or the distance to PAC to the field responders to ensure that the field responders understood the actions required to enter a potentially hazardous environment (see **OFI-Fluor Idaho-2**).

Considering the DOE Order 151.1C requirements discussed above, EA determined that the ECC checklists, emergency plan implementing procedures, and EALs do not provide adequate guidance to the EAM and ECC cadre relative to field responder health and safety. The INTEC EAM has overall responsibility for ensuring the health and safety of the field responders at INTEC. The ECC response procedures and checklists do not include tasks for ensuring field responders' situational awareness and a common operating picture, such as integrating the locations of field responders and the hazardous materials event, and communicating important information to field responders, such as safe command post location, primary hazard and monitoring requirements, or distance to PAC (see **Deficiency and OFI-Fluor Idaho-1 and OFI-Fluor Idaho-2**).

5.1.3 INL Emergency Operations Center

BEA and DOE-ID have a modern and functional EOC, located offsite in Idaho Falls, which is well equipped with information management capabilities, computer workstations, and telephones. EA noted two best practices during the exercise. First, BEA effectively used a well-integrated telephone bridge line and public-address system within the EOC to significantly enhance the EOC cadre's situational awareness. In addition, BEA used an integrated web-based geographical information system, iMAP, to provide the EOC cadre with maps, data, and analysis tools for the site and the surrounding area; this tool can also provide details about the interiors and utilities of many onsite buildings.

During the FSE, BEA, Fluor Idaho, and DOE-ID personnel stationed in the EOC adequately performed their assigned duties and followed the actions specified in their respective checklists. The BEA ED effectively maintained focus on strategic planning and delegated tasking of implementation to command and general staff, while also effectively instructing an in-training ED who participated as an observer. Likewise, the DOE-ID management duty officer effectively implemented the Federal responsibilities, as specified in the checklist for that position, and participated in briefings led by the ED.

During the FSE, BEA EOC personnel participated in training-drill mode, not with the intention of validating emergency response capabilities, plans, and procedures. While BEA fully activates and tests the operation of its EOC several times a year for INL events, this FSE was the planned validation test for 2017 for Fluor Idaho, which has a different concept of operations for managing an ICP emergency event. Fluor Idaho uses its EAM as the senior decision maker in the ERO, a position normally filled by the ED for a BEA event. During the August 2017 FSE, the INTEC EAM was responsible for emergency response at the facility and functioned as a part of the incident command system structure. Accordingly, the INTEC EAM executed appropriately his emergency-response-related decision-making responsibilities; determined and made PA recommendations; and authorized response resources. In addition, the INTEC EAM determined the PAs that were required outside of ICP Core facilities, which were then implemented by the appropriate BEA EAM or ED. However, because BEA participated in training-drill mode, this concept of operations was not fully tested and validated in the EOC.

5.1.4 INL Consequence Assessment

The consequence assessment function was performed in the EOC planning room, which is well equipped with dispersion modeling programs, weather information systems, geographical information systems, communications systems, and reference and response documents. BEA and National Oceanic and Atmospheric Administration personnel adequately staffed the EOC planning room to support Fluor Idaho's FSE and practice their response functions. Throughout the FSE, BEA and National Oceanic and Atmospheric Administration personnel in the planning room participated in a non-evaluated response mode, not with the intention of validating emergency response capabilities, plans, and procedures.

Consequence assessment personnel in the EOC planning room effectively demonstrated most of their responsibilities for implementing a timely initial assessment and performing continuous assessments as new information was received, using their procedures and checklists. Consequence assessment personnel confirmed that the INTEC EAM initially selected the correct EAL for the tornado event, and later for the potential release of radioactive material from the waste drums in the breached ISC. Consequence assessment personnel confirmed that the EAM properly categorized the tornado warning and determined that the breached ISC housing the drums could result in an SAE and that the PAs implemented at INTEC were appropriate. Consequence assessment personnel performed a timely initial assessment using the Radiological Safety Analysis Computer program and the HyRad dispersion modeling programs by projecting potential dispersions based initially on scripted tornado weather and then, once injected, on real-time weather and the conservative material-at-risk quantities analyzed in the emergency planning hazards assessment (EPHA) used for EAL development. Later, consequence assessment personnel effectively used the dispersion plume plots and the iMAP geographical information system to support site monitoring team activities near INTEC.

However, consequence assessment personnel did not develop a refined projection of the radioactive material dispersion using actual drum inventories. The INTEC ECC did not provide drum inventories on FRM-1935, *ICP Consequence Assessment Data Form*, for use in developing a refined consequence analysis. Later, consequence assessment personnel were provided drum inventories from a legacy database, known as Sealion, rather than from the INL Integrated Waste Tracking System (IWTS), as was expected. The Sealion database does not provide inventories in units of plutonium equivalent curies for direct use in the dispersion modeling projections, as IWTS does. Because converting the information from Sealion into usable units and calculating potential consequences is difficult to perform in a timely manner, consequence assessment personnel performed a qualitative assessment, based on the judgment that their earlier projections bounded a release of the actual drum inventories. After the exercise, Fluor Idaho personnel determined that the expectation for INTEC personnel to transmit drum inventories to the EOC using IWTS information is established through training rather than procedures, checklists, or data forms. Fluor Idaho evaluators appropriately determined this to be a weakness.

Some ERO members were not familiar with the plume plot information that consequence assessment personnel posted on WebEOC. Consequence assessment personnel posted a plume plot on a map developed using EPHA data that showed no PAC would be exceeded if a release occurred. The plume plot did identify areas that could have above-background projections, so consequence assessment personnel posted a note on WebEOC with the plume plot to inform ERO members that the plot indicated no PAC was exceeded. Nevertheless, some INTEC ERO members questioned the accuracy of the plume plot because they thought it indicated an unexpected release beyond the INTEC boundary.

The Fluor Idaho AAR reported similar observations and rated the consequence assessment response element satisfactory, with a weakness. The AAR indicates that the initial timely assessments and some continuous assessments were completed successfully, but that the analysis of the actual drum inventories was not performed and that some ERO members were not familiar with the plume plot BEA posted on

WebEOC. The AAR states that the INTEC ECC did not provide drum inventories to the consequence assessment specialist but that they were obtained by other means and were not further analyzed. Additionally, the AAR notes a missed objective – i.e., using sampling and monitoring activities to refine the source term. EA attributes that missed objective to the exercise design, because the scenario did not postulate a release that would provide an opportunity for sampling and monitoring activities to refine the source term. The readings from monitoring activities in the field were reported as background, indicating a zero source term (no breathable form of radioactivity), but background readings are present without a postulated release and do not reflect the amount of radioactivity in the drums. Furthermore, the AAR reports that Fluor Idaho personnel at INTEC and BEA personnel in the EOC were not familiar with the practice of posting postulated worst-case plume plots under actual weather conditions on WebEOC. The AAR documents a meeting held prior to the exercise with BEA consequence assessment personnel to discuss not posting default plume projections on WebEOC because it has caused confusion with ERO members in the past. Overall, Fluor Idaho adequately documented the response in the EOC planning room and identified issues for further evaluation.

5.1.5 Emergency Public Information

The public information room in the INL EOC was sufficiently equipped, adequately managed by the BEA public information director, and fully and adequately staffed with one Fluor Idaho, one DOE-ID, and two BEA players. The public information director drafted and approved the initial news release from a standardized template and transmitted it to the Joint Information Center (JIC) for issuance (simulated). Additional news releases were drafted by the staff, approved per procedure, and emailed from the public information room to the JIC.

As stated in the February 7, 2008 DOE Order 151.1C frequently asked questions, DOE should adhere to the standards of other Federal agencies and private industry by releasing information within one hour of the declaration of the event. The total time to issue the initial news release was 1 hour and 25 minutes. Both Fluor Idaho and BEA met their procedural requirements for issuance; however, BEA requires issuance within one hour of the JIC activation instead of the emergency event declaration time, which illustrates the importance of having an integrated response for evaluation.

5.1.6 Full-Scale Exercise Conduct

Simulation centers were adequate, staffed with experienced and knowledgeable participants to portray the responders who would likely participate during a real event. The simulation centers adequately generated injects, received player responses, and delivered scenario injects to represent actions, activities, and conversations with individuals who were not participating. As a result, the simulation centers were able to maintain exercise realism and allowed the participants to simulate the necessary coordination expected during a real event.

At the end of the exercise, C/Es held a hotwash at each venue to gather and document the participants' observations. Fluor Idaho also conducted a 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. Fluor Idaho also provided C/Es and observers with adequate exercise-specific training, rules of conduct, and guidelines on interactions with players, with exceptions noted at the event scene. On-scene C/Es provided players with information before it was earned.

The Fluor Idaho AAR identified most of the exercise conduct issues that EA noted. However, EA identified several weaknesses that did not appear in the Fluor Idaho AAR. Fluor Idaho exercise planners did not provide all controllers with the necessary technical data, such as the TRU waste drum contents and event scene map, to establish a common understanding of the event scenario. In the absence of this

information, the exercise control organization was less effective in keeping ahead of the responders to enable accurate information flow and properly control the exercise toward the planned objectives and subsequent evaluation. Injecting the technical data for the TRU waste drums from the INL IWTS when responders didn't access the IWTS database would more fully tests the Idaho Site processes rather than continuing with Sealion data, as discussed in Section 5.1.4.

5.1.7 Full-Scale Exercise Conclusion

Fluor Idaho has made numerous upgrades to the INTEC ECC and these improvements were validated during the exercise. In addition, the INTEC EAM appropriately used EALs to categorize the tornado conditions as an Operational Emergency and then classify the event as a SAE in a timely manner. Likewise, the EAM generated corresponding offsite notification forms and transmitted the forms to the WCC for further distribution. Throughout the exercise, the EAM appropriately focused on protecting employee health and safety.

However, Fluor Idaho graded the exercise as an unsatisfactory performance in its AAR because Fluor-Idaho's response did not demonstrate an acceptable level of integration with BEA, even though past activities with BEA had shown a better level of integration. Furthermore, the AAR stated that Fluor Idaho and BEA need to review the *Emergency Management Statement of Work-3683* and consider having all parties evaluate their performance at joint evaluated exercises. EA agreed that the August 2017 FSE was an unsatisfactory performance.

Nevertheless, the August 2017 FSE was intended to validate many response elements of the Fluor Idaho emergency management program, including integration of Fluor Idaho facility-level response with BEA. Fluor Idaho stated in its August 2017 FSE package that BEA would evaluate itself and any resulting actions that affect the exercise would be provided to Fluor Idaho for inclusion in their AAR; however, BEA did not share the same understanding and thus used the FSE only as an opportunity to train BEA personnel and provide hands-on experience for personnel, not to validate the emergency response capabilities, plans, and procedures used during an ICP event. Although Fluor Idaho implemented the exercise planning and evaluation processes described in their exercise manual, the manual does not adequately describe the FSE validation process necessary to demonstrate how the site-level response capabilities provided by BEA and performed in accordance with BEA procedures are to be tested and effectively integrated with Fluor Idaho's facility-level response capabilities and procedures. This programmatic deficiency is described further in Section 5.2.

EA also noted some weaknesses related to contractor exercise evaluations, as discussed further in Section 5.2. Fluor Idaho did not fully base the exercise evaluation criteria in its exercise evaluation guides on the NA-40 criteria in EMG 151.1-3 Appendix D or incorporate evaluation criteria for measuring performance with specific procedures or checklists as required by DOE Order 151.1C. EA observed the following examples of performance issues where Fluor Idaho did not identify a concern:

- Numerous event scene communications issues resulted in an overall lack of situational awareness by the field responders, creating unnecessary risk to their health and safety. The most significant of these was that the incident command post remained within 35 meters of the breached ISC for 46 minutes after identification of the breach.
- ECC checklists, emergency plan implementing procedures, and EALs did not provide adequate guidance to the EAM and ECC cadre for ensuring field response situational awareness and a common operating picture, resulting in an unsafe incident command post location.
- Fluor Idaho's initial news release did not meet the February 7, 2008, DOE Order 151.1C frequently asked questions guidance of release within 1 hour of the declaration of the event, exceeding it by 25 minutes.

5.2 Contractor Exercise Programs

5.2.1 BEA and Fluor Idaho Exercise Programs

Criteria:

Establish a formal exercise program through plans and implementing procedures that validates all elements of the emergency management program over a five-year period and includes building evacuation exercises consistent with Federal regulations, and regular communication system tests with DOE Headquarters and offsite agencies. (DOE Order 151.1C, Attachment 2, Contractor Requirements Document (CRD), 6)

Plan for exercises using an effective, structured approach designed to test the site's integrated emergency response capability. (DOE Order 151.1C, Attachment 2, CRD, 6 and 6.b.(2); DOE EMG 151.1-3, P3.3)

Prepare for exercises using an effective, structured approach designed to simulate realistic emergency events/conditions for facility-specific hazards in a manner that, as nearly as possible, replicates an integrated emergency response to actual event. (DOE Order 151.1C, Attachment 2, CRD, 6 and 6.b.(2); DOE EMG 151.1-3, P3.3, P3.4, and P3.34)

Document exercise performance and maintain records, including corrective actions, improvements, and lessons learned. (DOE Order 151.1C, Attachment 2, CRD, 6 and DOE EMG 151.1-3, 3.11.3, P3-46)

EA reviewed the INL ERAP and the following BEA and Fluor Idaho documents: emergency plan, exercise guide, five-year exercise plan, exercise evaluation objectives and criteria, and exercise plans and AARs from the past five years, as well as documentation for evacuation and accountability exercises. EA also interviewed the BEA and Fluor Idaho emergency management program manager and subject matter experts.

This section provides the results of EA's assessment of the emergency management exercise programs. EA's evaluation was based on a systematic and comprehensive approach using a combination of programmatic and exercise evaluation criteria. This section initially discusses the common BEA and Fluor Idaho exercise programs strengths, and then provides weaknesses associated with individual programs. The BEA and Fluor Idaho programs are similar because Fluor Idaho used the BEA framework and documentation to begin building its exercise program; therefore, the programs have similar strengths and weaknesses in some areas.

BEA and Fluor Idaho have well-structured exercise programs that appropriately require validation of all elements of the emergency management program over a five-year period. BEA has adequately documented the exercise program process in PLN-114, *INL Emergency Plan/Resource Conservation and Recovery Act Contingency Plan*, and GDE-467, *Emergency Drills and Exercises Guide*. Fluor Idaho has documented the exercise program process in PLN-2012, *ICP Emergency Plan/Resource Conservation and Recovery Act Contingency Plan*, and GDE-467, *Emergency Management Drills and Exercises Guide*. Furthermore, the exercise program documents incorporate DOE Order 151.1C requirements, such as exercise design, planning, conduct and evaluation, annual offsite communication tests, and annual building evacuations. Finally, the Fluor Idaho exercise guide appropriately cites use of the evaluation criteria issued by NA-40 in EMG 151.1-3, Appendix D.

BEA and Fluor Idaho have implemented their exercise programs effectively with exceptions noted. BEA and Fluor Idaho use a five-year exercise schedule to ensure all response elements are validated over a five-year period. Similarly, BEA has maintained an annual drill and exercise schedule, with input from Fluor Idaho, to ensure effective coordination and implementation among all contractors and response

organizations. Notably, in 2014, BEA conducted a beyond-design-basis-event exercise that involved the BEA site-level ERO, all five BEA and three other Idaho Site contractor facility-level EROs, and offsite organizations. During the past five years, BEA and, since June 1, 2016, Fluor Idaho have successfully planned for and demonstrated:

- Communications systems with DOE Headquarters, DOE-ID, and offsite agencies at least annually
- Annual building evacuation drills
- Annual facility-level exercises for all facility-level EROs
- Annual FSEs
- Exercise rotation among different hazardous materials facilities in FSEs from year to year
- Invitations to offsite response organizations to participate in sitewide exercises at least once every three years
- Obtaining DOE-ID approval of site-level exercise plans.

In addition, BEA and Fluor Idaho have effectively implemented the exercise planning process defined in their exercise guides. BEA and Fluor Idaho exercise planning teams, consisting of all participating organizations, coordinated exercise planning and provided supporting documentation of specific objectives, scope, timelines, injects, controller instructions, and evaluation criteria for realistic scenarios. The planning process for exercises provides for adequate coordination with appropriate offsite Federal, state, and local authorities; the media; and the public. In addition, BEA and Fluor Idaho request Federal, state, local, and regulatory participation for full participation exercises under existing memoranda of understanding. The BEA emergency management public liaison provides interface support for both BEA and Fluor Idaho exercises in which state, local, public, and tribal authorities, and the local media, participate.

BEA and Fluor Idaho effectively prepare for exercises by providing general and exercise-specific controller and evaluator training. BEA and Fluor Idaho also appropriately brief players before exercises and have incorporated a standard participant briefing outline in the exercise guide. In addition, to ensure consistent exercise development, Fluor Idaho has incorporated an exercise director checklist into the exercise guide. Finally, BEA and Fluor Idaho realistically simulate emergency conditions, with modified photos of damage areas, moulage of patients, radiological data, and meteorological data provided as in a real event.

BEA and Fluor Idaho have effectively documented exercise performance, maintained records, and followed up exercises with corrective actions, improvements, and lessons learned. They also have records of key program documents, such as AARs detailing evaluation efforts, corrective action plans, and critique minutes and have demonstrated the ability to document exercise performance and maintain exercise records. In addition, BEA and Fluor Idaho provide their respective EROs with lessons learned through annual training, newsletters, and required reading as a means to effectively foster continuous improvement associated with emergency response. Finally, BEA and Fluor Idaho have developed corrective action plans for improvement items and weaknesses from exercises and incorporated those plans into the corporate issues management system for closure.

However, BEA and Fluor Idaho have some weaknesses in their exercise programs. The BEA emergency plan and exercise guide do not address participation with applicable DOE radiological response assets every three years or conduct an exercise involving the full spectrum of events, such as an unplanned nuclear criticality event, during a five-year period. BEA has responsibility for three facilities with a potential for an unplanned nuclear criticality. Furthermore, such an event that includes irradiated personnel would require interaction with the Radiation Assistance Center/Training Site, which is a DOE asset. Although BEA has conducted exercises involving some DOE assets (National Atmospheric

Release Advisory Center and Radiological Assistance Program) during the past three years, BEA has not defined in its emergency plan which DOE assets might be used at the Idaho Site and conducted exercises accordingly (see **OFI-BEA-1**).

In addition, BEA has developed a set of generic evaluation objectives and supporting criteria for use by exercise evaluators when evaluating any of the five facility-level and site-level EROs; however, these objectives and criteria are not comprehensive or linked to procedures and checklists. BEA has not fully based the exercise evaluation criteria in the EEGs on criteria issued by NA-40 in EMG 151.1-3 Appendix D or incorporated evaluation criteria for measuring performance into specific procedures or checklists (see **Deficiency and OFI-BEA-2**). BEA provided EA information on how some of the EEGs relate to Appendix D, but the scope of the exercise evaluation depends on the completeness of the objective and criteria database, and the exercise guide is currently based on only a subset of the Appendix D criteria. BEA has not completed a comprehensive crosswalk of the EEGs to the Appendix D criteria or documented the connection to specific procedures to ensure validation of comprehensive performance goals for each response element over a five-year period.

Furthermore, Fluor Idaho and BEA have two distinct emergency plans and concepts of operation, and Fluor Idaho has not described how to conduct an annual FSE to validate its emergency response capability while also fully evaluating the integrated response capability with BEA. Most importantly, Fluor Idaho has not established a validation process that would demonstrate how BEA's site-level response capabilities, which are conducted in accordance with BEA procedures, will be tested and effectively integrated with Fluor Idaho's facility-level response capabilities and procedures (see **Finding F-Fluor Idaho-1 and OFI-Fluor Idaho-3**). Fluor Idaho only partially validated the fully integrated response during the August 2017 FSE, noting numerous issues resulting from combining a Fluor Idaho exercise with multiple, venue-specific BEA drills. The validation process did not include BEA approval of the exercise planning, preparation, and conduct, as well as approval of the AAR. Since the contract started on June 1, 2016, Fluor Idaho has invested considerable effort in realigning the three facility-level EROs from the previous contractors into two facility-level EROs, and revising the Fluor Idaho emergency plan and most of the emergency plan implementing procedures accordingly. In addition, Fluor Idaho has a significantly different ERO concept of operation than BEA; the differences are primarily associated with the EAM retaining responsibility for key functions, such as categorization and classification, notifications, PAs, and PA recommendations. Conversely, BEA facility EAMs transition these functions to the ED. In summary, Fluor Idaho's exercise documentation does not adequately describe joint BEA and Fluor Idaho FSE planning, conduct, and evaluation.

Additionally, Fluor Idaho has not fully implemented the exercise planning process defined in its exercise guide for all exercises conducted since June 1, 2016. Fluor Idaho planning teams, consisting of all participating organizations, coordinated each individual exercise planning process and provided supporting documentation of specific objectives, scope, timelines, injects, controller instructions, and evaluation criteria for realistic scenarios. However, the exercise plan cue cards did not include some key technical data required by the exercise guide. During the August 2017 FSE, Fluor Idaho omitted damage photos, plume model projections, waste container contents, patient injury and contamination body maps, and event scene maps from the exercise cue cards, and these omissions adversely affected exercise conduct (see **OFI-Fluor Idaho-4**).

Finally, Fluor Idaho has developed a set of generic evaluation objectives and supporting criteria for exercise evaluators' use. However, Fluor Idaho did not fully base the exercise evaluation criteria in the EEGs on the criteria issued by NA-40 in EMG 151.1-3 or link the evaluation criteria for measuring performance with specific procedures or checklists (see **Deficiency and OFI-Fluor Idaho-5**). One of the EMG 151.1-3 criteria, "Provisions are implemented to ensure that security, fire, medical, and other response personnel are protected from exposures to hazards during their course of movements while

supporting response,” would have helped the Fluor Idaho evaluators for the August 2017 FSE identify the health and safety-related deficiency noted by EA. Furthermore, EMG 151.1-3 criteria provide a common evaluation basis for Idaho Site contractors to measure performance consistent with specific procedures and checklists during an integrated response.

5.2.2 Exercise Conduct and Evaluation

Criterion:

Each exercise must be conducted, controlled, evaluated, and critiqued effectively and reliably. (DOE Order 151.1C; paraphrased from CRAD EA 33-05)

EA assessed BEA and Fluor Idaho implementing practices against each organization’s exercise program documents, which include exercise plans, emergency plans, implementing procedures, and emergency management drill and exercise manuals.

BEA’s and Fluor Idaho’s emergency plans and emergency management drill and exercise guides establish identical frameworks for conducting exercises. These documents describe drill and exercise preparation, presentation of the scenario, the roles of C/Es, hotwashes, and critiques of the Idaho Site’s exercise programs. In addition, BEA and Fluor Idaho have appropriately established separate exercise control groups to promote effective coordination among onsite organizations or groups regarding their respective participation and exercise objectives.

BEA and Fluor Idaho exercise AARs adequately document their exercises. The scenario material in the exercise packages is consistent with the exercise objectives and supports a demonstration of each objective. BEA’s and Fluor Idaho’s exercise packages also appropriately document any limitations or simulations related to the participation of onsite and offsite organizations. BEA and Fluor Idaho typically use an experienced group of C/Es who are familiar with the areas assigned for control and evaluation. In addition, they conduct a critique at each venue immediately after the exercise, using the protocols outlined in their respective emergency management drill and exercise manuals, to foster critical assessments and to gather and document the participants’ observations. After FSEs, BEA and Fluor Idaho also conduct a formal factual accuracy review with C/Es 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. BEA and Fluor Idaho categorize issues identified during exercises as findings, deficiencies, or weaknesses, consistent with the DOE EMG, and use those terms to properly process findings in the separate contractor issues management systems.

However, missing from both the BEA and Fluor Idaho evaluation processes are specific evaluation criteria for measuring performance using a procedure or checklist, as discussed in Section 5.2.1. BEA and Fluor Idaho have incorporated only minimal references to specific plans, procedures, or standards in facility/site- or activity-specific evaluation criteria, and the lack of implementing details diminishes the effectiveness and reliability of exercise evaluations. EA previously documented this complex-wide weakness in *Office of Enterprise Assessments Lessons Learned from the 2014 Emergency Management Reviews – April 2015* report.

5.2.3 Contractor Exercise Programs Conclusion

Overall, BEA has effectively implemented a well-structured exercise program that requires validation of all elements of the emergency management program over a five-year period, with the exception of EMG 151.1-3 Appendix D criteria. BEA’s exercise guide provides adequate guidance for the BEA exercise planning team to plan, prepare, conduct, critique, and document exercises in order to promote continuous

improvement of the BEA site-level and facility-level EROs, which are each tested annually. Furthermore, BEA has effectively maintained an annual drill and exercise schedule to ensure effective coordination among all Idaho Site contractors. BEA conducted a beyond-design-basis-event exercise for the entire Idaho Site, a noteworthy practice, involving a total of eight facility-level EROs and the INL site-level ERO. However, BEA has not fully defined which DOE radiological response assets are applicable to the Idaho Site or conducted an exercise involving an unplanned nuclear criticality event during the past five years. In addition, BEA has not fully based the exercise evaluation criteria in its EEGs on the comprehensive criteria issued by NA-40 in EMG 151.1-3 Appendix D or incorporated evaluation criteria for measuring performance by using specific procedures or checklist.

Overall, Fluor Idaho appropriately requires validation of all elements of the emergency management program over a five-year period and has effectively implemented most aspects of the exercise program. Fluor Idaho's exercise guide provides adequate guidance for its exercise planning team to plan, prepare, conduct, critique, and document exercises in order to promote continuous improvement of the facility-level EROs, which are each tested annually. In addition, to ensure consistent exercise development, Fluor Idaho has incorporated an exercise director checklist into the exercise guide. However, Fluor Idaho has not described the implementation of the process used to demonstrate how the exercise program validates the comprehensive performance of the Fluor Idaho and BEA integrated response capability. In addition, Fluor Idaho has not fully based the exercise evaluation criteria in its EEGs on the comprehensive criteria issued by NA-40 in EMG 151.1-3 Appendix D or incorporated evaluation criteria for measuring performance by using specific procedures or checklists.

5.3 DOE-ID Readiness Assurance Program

DOE-ID adequately participates in the Idaho Site readiness assurance program by conducting a series of evaluations, stimulating program improvements, and providing reports and records on the status of the Idaho Site emergency management program, as detailed below.

5.3.1 DOE-ID Oversight Assessments and Self-Assessments

DOE-ID performs its role in the Idaho Site readiness assurance program through self-assessments, oversight of the contractors' role in the Idaho Site readiness assurance program, and review and approval of key emergency management program documents, such as hazards surveys, EPHAs, exercise plans, and emergency plans. DOE-ID has developed adequate work instructions and program descriptions for conducting effective self-assessments, oversight assessments, and reviews of hazards surveys and EPHAs. DOE-ID appropriately establishes assessment activities via assessment plans, CRADs, and schedules; the CRADs are based on DOE Order 151.1C and are supported by lines of inquiry that are partly based on the evaluation criteria NA-40 issued in EMG 151.1-3 Appendix D to provide the guidance for an effective review. DOE-ID uses its Zeus issues management system for scheduling assessment activities, tracking evaluation findings, and documenting some oversight activities. DOE-ID also documents its oversight activities in assessment reports.

5.3.1.1 DOE-ID Oversight

DOE-ID ERAP Approval and Submittals

Criterion:

Review and approve ERAPs that cover facilities under their supervision; prepare the Field Element ERAP; submit it to the Program Office and NA-40, for inclusion in the annual report on the status of the Emergency Management System. (DOE Order 151.1C, I.9.h.)

EA reviewed ERAPs and ERAP approval and transmittal letters from the past three years.

DOE-ID reviews, approves, and submits the consolidated DOE-ID ERAP to DOE Headquarters organizations to provide the status of the Idaho Site emergency management program in time for the DOE Annual Report. The DOE-ID ERAP accurately documents the readiness of the Idaho Site emergency management program and the accomplishments of the past year and goals for the next year. While the ERAP is written mostly by site contractors, DOE-ID adds information about DOE-ID evaluations and reviews, approves the annual ERAP, and submits the ERAP to NA-40, NE, and EM in time for Headquarters personnel to develop the annual DOE emergency management status report.

DOE-ID Assessments

Criterion:

Conduct assessments of facility emergency management programs at least once every three years and review contractor self-assessment programs annually to ensure compliance with DOE directives and policy; provide the results/conclusions to the Program Office and NA-40. (DOE Order 151.1C, I.9.m)

EA reviewed DOE-ID CRADs, review plans, and assessment reports from the past three years and interviewed DOE-ID personnel.

DOE-ID performs assessments of all elements of contractor emergency management programs within a three-year period (a triennial review). DOE-ID assesses one of the Idaho Site contractor emergency management programs each year, covering all 15 program elements. One exception in the past three years was during 2016, when DOE-ID was due to perform a triennial review of the outgoing contractors' emergency management programs. At that time, the new contractor, Fluor Idaho, became the responsible contractor for two outgoing emergency management programs. Therefore, DOE-ID reviewed these emergency management programs as part of the contractor transition review in 2016.

The DOE-ID evaluation criteria for triennial reviews are based on the DOE Order 151.1C CRD and are supported by lines of inquiry partly based on EMG 151.1-3 Appendix D criteria, but DOE-ID did not verify that Idaho Site contractors use evaluation criteria issued by NA-40, as required by the CRD. Instead, when it reviewed BEA in 2015, DOE-ID used the evaluation criteria in BEA's guide, without further determining whether the criteria were issued by NA-40. EA determined that those criteria were not issued by NA-40 and are less comprehensive than the NA-40 evaluation criteria, as discussed in Section 5.2 (see **OFI-DOE-ID-1**).

DOE-ID documents its triennial reviews of contractor emergency management programs in assessment reports. The reports provide a complete record of assessment activities and results and reflect a well-developed Idaho Site emergency management program, with assigned ratings of "effective" in all areas.

DOE-ID provides adequate oversight of Idaho Site emergency management activities. DOE-ID reviews contractor self-assessments annually, either as part of the triennial review or through a separate review, and documents the results of these reviews in the triennial report or in the Zeus database. DOE-ID also reviews and approves key emergency management documents, such as hazards surveys and EPHAs (which are on a three-year review cycle), exercise plans, and contractor emergency plans. DOE-ID adequately communicates its review and approval of these documents via letter to the responsible contractor, or provides written comments for resolution before approval. DOE-ID's comments indicate that continuous improvements are evident in an already well-developed Idaho Site emergency management program. DOE-ID withholds its approval pending resolution of significant comments.

DOE-ID's assessment reports provide meaningful information regarding the scope of the review, the criteria used, and the results. Overall and individual program element ratings have been "effective performance" since 2013. Two findings and several observations were reported to stimulate program improvements since 2013. DOE-ID adequately reports the status of readiness assurance program reviews and has identified program weaknesses to NE, EM, and NA-40 via the annual ERAP submittal.

5.3.1.2 DOE-ID Self-Assessments

Criterion:

Assess the Field Element emergency management program annually and record the results of the self-assessment in the Field Element portion of the ERAP. (DOE Order 151.1C, I. 9.c.(3))

EA reviewed DOE-ID's self-assessment plans, reports, and ERAPs from the past three years and interviewed DOE-ID personnel.

DOE-ID conducts annual self-assessments of its emergency management program responsibilities and provides the results in the annual ERAP submittal to DOE Headquarters organizations. DOE-ID has a noted strength of conducting self-assessments using a well-structured self-assessment guide, which incorporates criteria that are partly based on DOE Order 151.1C and EMG 151.1-3 Appendix D criteria. The self-assessment guide provides instructions for the assessment team and serves as a record of results, once completed. The guide focuses on the six areas in which DOE-ID is responsible for preparing and implementing the Idaho Site emergency management program. After completion, DOE-ID reports a clear and complete record of the assessment activities and results and further submits the results to NA-40, EM, and NE in the annual ERAP.

5.3.2 DOE-ID Improvement Program

Criteria:

Implement corrective actions and lessons learned from actual emergency responses and based on findings from evaluations, assessments, and appraisals. (DOE Order 151.1C, I.9.o.)

EA reviewed DOE-ID's continuous improvement process descriptions and work instructions, interviewed DOE-ID emergency management personnel, and reviewed DOE-ID corrective action databases.

DOE-ID effectively maintains an emergency management corrective action program and adequately conducts oversight of contractor corrective action activities. DOE-ID work instruction 01.WI.03.12, *Corrective Actions*, governs DOE-ID's corrective action program and provides sufficient guidance and adequate detail for consistent application of the program. DOE-ID conducts numerous oversight surveillances of exercises and training drills and documents its assessment and a summary of the contractor's corrective actions in the Zeus issues management system. On average, DOE-ID conducts just over 2.4 surveillances of contractor exercises and drills per month and adequately documents the results. DOE-ID documents contractor corrective actions developed during the post-exercise and drill critiques in the write-up section, but does not document whether the corrective actions are entered into the contractor's corrective action tracking system. DOE-ID stated and EA verified that contractors were documenting issues in their corrective actions programs.

As part of the oversight function, DOE-ID followed up on two findings from a contractor's 2015 assessment and appropriately entered the follow-up activity into Zeus and tracked the issues. When DOE-ID disagreed with the closure date of one of the corrective actions, the discrepancy was handled informally and the contractor increased efforts to close the action item.

DOE-ID work instruction 01.WI.03.05, *ID Lessons Learned*, provides sufficient guidance to manage the lessons-learned program, with one exception explained below. DOE-ID assigns one individual to the program whose primary duty is to serve as the lessons-learned coordinator. The coordinator uses the DOE Corporate Lessons Learned database and the newer OPEXSHARE website, as well as information internal to the Idaho Site, to distribute daily lessons learned. The coordinator distributes daily lessons-learned information to a large number of individuals on site, including the DOE-ID emergency management department and both BEA and Fluor Idaho emergency management organizations. Although DOE-ID distributes reports to a large number of individuals, key contractor emergency management personnel, including both the BEA and Fluor Idaho directors of emergency management, do not receive the reports.

Nevertheless, 01.WI.03.05 does not include guidance on submitting information to the DOE lessons learned program. DOE-ID and the Idaho Site contractors did not submit any emergency management lessons learned to the DOE Corporate Lessons Learned program for the past five years. DOE-ID and the Idaho Site missed several opportunities to submit such information, such as two emergency information-related social media training drills in 2016 and BEA's use of additional, more detailed emergency management performance indicators, including metrics for timely implementation of drills, emergency management training initiatives, conduct of management observations of emergency management activities, and interactions with non-Idaho Site emergency management community organizations. Using performance indicators that provide a detailed picture of the health of an emergency management organization is a good lesson learned and could be implemented at other sites. DOE-STD-7501-99, *The DOE Corporate Lessons Learned Program*, states that organizations should establish practices or protocols for determining when information constitutes a lesson learned and provides examples of sources of lessons learned, such as assessments, training evolutions, and performance improvement initiatives.

5.3.3 DOE-ID Readiness Assurance Program Conclusion

Overall, DOE-ID has an effective program to ensure effective implementation of the DOE emergency management directives and policy. DOE-ID conducts assessments of facility emergency management programs at least once every three years, reviews contractor self-assessment programs annually, and assesses the field element emergency management program annually. DOE-ID's use of a self-assessment guide is a strength. NE, EM, and NA-40 receive the results of DOE-ID reviews via the annual ERAP submittal, in time for the DOE annual report on the status of emergency management programs. Furthermore, DOE-ID reviews and approves key emergency management documents, such as hazards surveys, EPHAs, exercise plans, emergency plans, and ERAPs. DOE-ID uses DOE Order 151.1C and EMG 151.1-3 for evaluation criteria and lines of inquiry, respectively. However, the contractors have not met the DOE order requirement to use the evaluation criteria issued by NA-40 for contractor self-assessments, and DOE-ID did not identify this discrepancy.

DOE-ID effectively maintains an emergency management corrective action program and adequately conducts oversight of contractor corrective action activities. However, DOE-ID has not fully participated in the DOE Corporate Lessons Learned program with respect to emergency management issues. The DOE-ID work instruction on lessons learned lacks specific guidance to encourage and better define what constitutes emergency management program lessons learned that should be submitted to the DOE Corporate Lessons Learned program.

5.4 Corrective Actions for Past EA Findings

EA followed up on its 2012 natural phenomena event assessment at the Idaho Site, focusing on the status of one finding. In the 2012 report, EA concluded that BEA had not established provisions for assessing the actual onsite consequences of all potential hazardous chemical releases that travel beyond the facility

boundary. BEA closed the finding in 2012. EA reviewed the corrective action plan and evidence files for closure and interviewed BEA personnel responsible for finding closure to draw conclusions.

BEA has effectively determined its inventory of hazardous chemicals and identified the instruments needed to detect all of its hazardous chemicals, if released. Using the BEA corrective action process, BEA used the results of its hazards surveys to identify hazardous chemicals, purchased some needed detectors, and made the detectors available to the INL industrial hygienists. BEA also issued procedure EPI-59, *Site Area Emergency Airborne Hazardous Chemical Monitoring*, to be implemented by site industrial hygienists, and provided industrial hygienists with training and drills on this new procedure. The corrective actions are appropriate and the finding is properly closed.

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, 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.

Fluor Idaho, LLC

Finding F-Fluor Idaho-1: The Fluor Idaho exercise program has not established and implemented a validation process to demonstrate whether the Fluor Idaho response is adequately integrated with the site-level response provided by BEA. (DOE Order 151.1C, Attachment 2, 6.b.(1 and 2))

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 only 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.

Battelle Energy Alliance, LLC

OFI-BEA-1: To improve BEA's validation of response capabilities over the required timeframes, consider:

- Defining the DOE radiological response assets with potential for interacting with the Idaho Site in the INL emergency plan
- Identifying the DOE radiological response assets interface requirements in emergency plan implementing procedures
- Scheduling and conducting exercises involving the DOE assets on a three-year basis

- Inviting Radiation Emergency Assistance Center/Training Site to conduct training with the local hospitals
- Identifying the INL response capabilities required to be validated over a five-year period
- Scheduling and conducting exercises involving INL response capabilities on a five-year basis.

OFI-BEA-2: To improve exercise evaluation processes, consider implementing the Exercise Builder tool for exercise development, including the evaluation module available from the Emergency Management Issues Special Interest Group.

Fluor Idaho, LLC

OFI-Fluor Idaho-1: To improve ECC situational awareness and a common operating picture among response organizations, consider:

- Defining and documenting the BEA fire department interface:
 - Monitoring capabilities
 - Fluor Idaho's support resource requirements for the BEA fire department
 - Fluor Idaho/fire department interface protocols
- Utilizing the BEA iMap geographical information system mapping tool:
 - Display the PAC boundary for the response hazard
 - Display the location of the event
 - Display the location of all field responders
 - Post the map on one of the monitors in the ECC
- Capturing whiteboard information in WebEOC, such as:
 - ECC priorities
 - ECC taskings
 - Accountability status
 - Reentry planning priorities
- Utilizing an integrated bridge line with an ECC speaker system, similar to the BEA EOC bridge line, for direct communications between the EAM and the IC.

OFI-Fluor Idaho-2: To help ensure the health and safety of BEA field responders, consider:

- Establishing a protocol for conducting periodic direct communications between the EAM and the IC to clarify:
 - Event-specific hazards
 - PAC boundary
 - Specific geographical areas of EAM and IC responsibilities
 - Incident action plan
 - ECC response priorities
 - Command post and field responder locations
- Updating INTEC procedures to reflect key responder health and safety communications with the results from the items above
- Updating EALs to include distance to PAC and primary hazards for responders.

OFI-Fluor Idaho-3: To ensure validation of the Fluor Idaho/BEA response interfaces during the annual FSE, consider:

- Updating Fluor Idaho documentation to describe the evaluation process for the comprehensive, integrated Fluor Idaho and BEA response
- Conducting the annual FSE with both Fluor Idaho and BEA participating as evaluated exercise participants

- Developing a single exercise plan and AAR
- Involving BEA in the following FSE functions:
 - Drill and exercise planning team
 - Scenario design team
 - Exercise evaluation
 - BEA sign-off of the following documentation
 - Exercise plan
 - AAR.

OFI-Fluor Idaho-4: To improve the exercise planning process and planning documentation, consider defining specific exercise plan technical information cited in the exercise guide to be included on the exercise plan cue cards, such as:

- Damage photos
- Patient moulage details
- Meteorological data
- Plume model projections
- Event scene maps
- Patient injury and contamination maps
- Waste container contents.

OFI-Fluor Idaho-5: To improve the evaluation process, consider implementing the Exercise Builder tool for exercise development, including the evaluation module available from the Emergency Management Issues Special Interest Group.

DOE Idaho Operations Office

OFI-DOE-ID-1: To further complete DOE-ID's evaluation criteria, consider adding a criterion to evaluate whether Idaho Site contractors use the current NA-40 evaluation criteria when performing their self-assessments.

Appendix A Supplemental Information

Dates of Assessment

Onsite Assessment: July 25 – September 29, 2017

Office of Enterprise Assessments (EA) Management

William A. Eckroade, Acting 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
C.E. (Gene) Carpenter, Jr., Director, Office of Nuclear Safety and Environmental Assessments
Kevin G. Kilp, Acting Director, Office of Worker Safety and Health Assessments
Gerald M. McAteer, Director, Office of Emergency Management Assessments

Quality Review Board

Steven C. Simonson
John S. Boulden III
Thomas R. Staker
William E. Miller
Michael A. Kilpatrick

EA Site Lead for the Idaho Site

Rosemary Reeves

EA Assessors

Randy Griffin – Lead
John Bolling
Dirk Foster
Tom Rogers
Bill Scheib

Appendix B

Key Documents Reviewed and Interviews

Documents Reviewed

- 01.PD.03, *ID Continual Improvement Process*, Rev. 15, 10/31/2016
- 01.WI.03.01, *ID Assessments*, Rev. 12, 10/31/2016
- 01.WI.03.03, *Internal Audits*, Rev. 17, 3/22/2017
- 01.WI.03.05, *ID Lessons Learned*, Rev. 8, 10/19/2016
- 01.WI.03.12, *Corrective Action*, Rev. 15, 8/23/2017
- 03.PD.04, *Contractor Oversight*, Rev. 12, 11/16/2016
- 03.WI.01.15, *Emergency Management Hazards Survey and Hazards Assessment Review, Comment, and Approval*, Rev. 3, 10/25/2016
- 03.WI.04.02, *Conduct of Oversight Activities*, Rev. 17, 10/31/2016
- AST-2017.05.22-509527, *Corrective Action Verification of the 2015 BEA Assessment*, 6/1/2017
- Corrective Action Plan for Finding F-1 from the 2012 Independent Oversight Severe Natural Event Review, 9/11/2012
- *Daily Occurrence & Lessons Learned Summary* for 7/24/2017
- *DOE-ID Drill and Exercise Oversight Surveillances*, 12/21/2015 to 5/22/2017
- *DOE-ID Self-Assessment Reports*, 2012, 2013, 2014, 2015, 2016
- *DOE-ID Triennial Review Reports*, 2014 and 2015
- EPI-59, *SAE Airborne Hazardous Chemical Monitoring*, Rev. 3, 5/10/2017
- EPI-64, *Incident Command at INL*, Rev. 11, 10/30/2013
- FRM-1931, *Idaho Cleanup Project Core INTEC Evaluated Exercise, Scenario Number: INTEC.E/C.005*, Rev. 2, 8/9/2017
- GDE-467, *Emergency Drills and Exercises*, Rev. 2, 3/20/2013 (BEA)
- GDE-467, *Emergency Management Drills and Exercises*, Rev. 8, 4/27/2017 (Fluor Idaho)
- *ID ERAP 2016/2017*
- Idaho National Laboratory's EPI-64, *Incident Command on the INL*, Rev. 11, 10/30/2013
- PLN-114, *INL Emergency Plan/Resource Conservation and Recovery Act Contingency Plan*, Rev. 91, 7/26/2017
- PLN-2012, *ICP Core Emergency Plan/RCRA Contingency Plan*, Rev. 22, 5/3/2017
- SOW-3683, *Statement of Work for Emergency Management Services*, Rev. 16, 6/1/2016

Interviews

- BEA Emergency Management Department Manager
- BEA Drill and Exercise Program Manager
- DOE-ID Emergency Management Program Administrator
- DOE-ID Emergency Management Program Specialist
- DOE-ID Lessons Learned Coordinator
- Fluor Idaho Emergency Management Program Department Manager
- Fluor Idaho Drill and Exercise Program Manager
- Fluor Idaho ECC Emergency Action Manager
- Fluor Idaho ECC Planning Manager

- Fluor Idaho ECC Operations Manager
- On-scene Exercise Evaluator
- Fire Department Controller/Evaluator

Appendix C Deficiencies

Deficiencies that did not meet the criteria for a finding are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

Battelle Energy Alliance, LLC

- BEA has not fully based the exercise evaluation criteria in the EEGs on criteria issued by NA-40 in EMG 151.1-3 Appendix D or incorporated evaluation criteria for measuring performance into specific procedures or checklists as required by DOE Order 151.1C, Attachment 2, 7.

Fluor Idaho, LLC

- Fluor Idaho has not adequately provided documented guidance to the ECC cadre on the interface with the BEA response organization relative to ensuring situational awareness and a common operating picture and communicating event hazards associated with a release as required by DOE Order 151.1C, Attachment 2, 12 and 14.
- Fluor Idaho has not fully based the exercise evaluation criteria in the EEGs on criteria issued by NA-40 in EMG 151.1-3 Appendix D or incorporated evaluation criteria for measuring performance into specific procedures or checklists as required by DOE Order 151.1C, Attachment 2, 7.