

**Office of Enterprise Assessments  
Assessment of Emergency Management at the  
Paducah Site**



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## Acronyms

AAR	After-Action Report
BWCS	BWXT Conversion Services, LLC
CRAD	Criteria and Review Approach Document
CRD	Contractor Requirements Document
DOE	U.S. Department of Energy
DUF6	Depleted Uranium Hexafluoride Conversion Facility
EA	Office of Enterprise Assessments
EM	Office of Environmental Management
EMG	Emergency Management Guide
EOC	Emergency Operations Center
ERAP	Emergency Readiness Assurance Plan
ERO	Emergency Response Organization
FFS	Fluor Federal Services, Inc.
FY	Fiscal Year
HAZMAT	Hazardous Material
IP	DOE Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2014-1, <i>Emergency Preparedness and Response</i>
MCS	Mid-America Conversion Services, LLC
MTS	Management Tracking System
NA-40	NNSA Office of Emergency Operations
NARAC	National Atmospheric Release Advisory Center
NNSA	National Nuclear Security Administration
NRC	U.S. Nuclear Regulatory Commission
OFI	Opportunity for Improvement
PA	Protective Action
PGDP	Paducah Gaseous Diffusion Plant
PPPO	Portsmouth/Paducah Project Office
QA	Quality Assurance
RAP	Radiological Assistance Program
SSI	Swift and Staley Incorporated
USEC	United States Enrichment Corporation

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**Assessment of Emergency Management at the Paducah Site**

**EXECUTIVE SUMMARY**

The U.S. Department of Energy (DOE) Office of Emergency Management Assessments, within the independent Office of Enterprise Assessments (EA), assessed the Paducah Site from April 11 to May 11, 2017. The purpose was to evaluate the contractors' emergency management readiness assurance and exercise programs and Office of Environmental Management Portsmouth/Paducah Project Office (PPPO) oversight of the site's emergency management program.

Fluor Federal Services, Inc. (FFS) is responsible for the deactivation of the Paducah Gaseous Diffusion Plant, which has transitioned from U.S. Nuclear Regulatory Commission to DOE oversight under DOE Order 151.1C, *Comprehensive Emergency Management System*. In addition, FFS is the administrator of the Paducah Site contractors' emergency services which include emergency management, fire, and protective force capabilities. The FFS contract expired in July 2017, and these services are being transferred to the new contractor, Four Rivers Nuclear Partnership, LLC. The DOE Paducah Site Lead requested that this assessment report focus on the contractors in place at the time of the assessment. Once the final report is issued, the DOE Paducah Site Manager will formally direct, as appropriate, the Four Rivers Nuclear Partnership, LLC to evaluate and respond to the results of this assessment.

Mid-America Conversion Services, LLC (MCS) has operated the Depleted Uranium Hexafluoride Conversion Facility (DUF6) since February 2017. MCS implemented a contract transition effort for the condition reporting program to address previously identified issues and corrective actions. Both FFS and MCS have their own issues management and lessons-learned programs. Swift and Staley Incorporated (SSI) provides site infrastructure services. MCS and SSI each have their own emergency plan designed to support the FFS site-level plan.

EA identified several positive attributes of the reviewed programs. FFS made significant improvements in its exercise program since October 2014 by using the Exercise Builder tool for exercise development. The site contractors' (FFS, MCS, and SSI) emergency readiness assurance programs include the three major components of the program: evaluations, improvements, and an emergency readiness assurance plan (ERAP). In addition, the site contractors have appropriately implemented the required major components for evaluations, in accordance with their respective corporate procedures. Additionally, PPPO and the site contractors provide appropriate input to the annual ERAP.

Although EA identified several positive attributes, as discussed above, EA also identified several issues with the emergency management self-assessments, exercise evaluations, and emergency management improvement programs. FFS has not performed verification and validation activities to confirm that corrective actions have been resolved, as required. Additionally, some of the site contractor self-assessments of their emergency management programs were not adequate. FFS incorrectly categorized some performance issues during exercise evaluations, thereby hindering program improvements.

EA also identified a weakness in PPPO's oversight and self-assessments of the emergency management program. PPPO assessments are not fully effective in improving the emergency management program because PPPO does not perform complete evaluations of contractor emergency management programs over a three-year period, review contractor self-assessments annually, or conduct assessments of the PPPO emergency management program annually as required by DOE Order 151.1C.

Overall, the programmatic finding and deficiencies are limiting line management's ability to fully

understand the status of and pursue continuous improvement in the emergency management program at the Paducah Site. EA has provided several opportunities for improvement as recommendations to assist line management in improving the emergency management readiness assurance and exercise programs.

**Office of Enterprise Assessments**  
**Assessment of Emergency Management at the Paducah 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 readiness assurance program at the Paducah Site, formerly known as the Paducah Gaseous Diffusion Plant (PGDP), 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*.

**2.0 SCOPE**

EA assessed the effectiveness of the Paducah Site readiness assurance program, which is a sitewide program element of a DOE emergency management program. The Portsmouth/Paducah Project Office (PPPO) and contractors each have a role in implementing the Paducah Site readiness assurance program through a series of evaluations, improvement actions, and emergency readiness assurance plans (ERAPs). EA assessed the readiness assurance activities conducted over the past three years by PPPO, Fluor Federal Services, Inc. (FFS), Mid-America Conversion Services, LLC (MCS), and Swift and Staley Incorporated (SSI) (formerly known as the Swift and Staley Team) regarding oversight, self-assessments, exercise evaluations, corrective action implementation, lessons learned, and readiness assurance plans, as assigned to each organization within the Paducah Site readiness assurance program. EA also assessed the closure of a finding from its previous visit, which was a review of severe event preparedness consistent with DOE's Operating Experience Level-1, *Improving DOE Capabilities for Mitigating Beyond Design Basis Events* bulletin that incorporated lessons learned from the 2011 tsunami event at the Fukushima reactors in Japan.

**3.0 BACKGROUND**

Various operating contractors produced enriched uranium at the Paducah Site from 1952 to 2013. The PGDP ceased operations in 2013 and is now a deactivation project under the DOE Office of Environmental Management (EM). The EM PPPO provides Federal oversight of the contractors. PPPO consists of a lead Operations Group in Lexington, Kentucky, and Operations Oversight Groups at the Paducah Site and the Portsmouth Gaseous Diffusion Plant that share personnel resources. PPPO has contracted with Professional Project Services, Inc. for site office technical and administrative support. FFS provides for deactivation of the Paducah Site and has responsibility for the site-level emergency management program. MCS operates the Depleted Uranium Hexafluoride Conversion Facility (DUF6), and SSI provides site infrastructure services. MCS and SSI each have their own emergency plan designed to support FFS's site-level plan. FFS and MCS have hazardous material (HAZMAT) operations, but SSI does not. DOE Order 151.1C requires a HAZMAT emergency management program at the Paducah Site because of radioactive material and toxic chemicals used and stored on site. PPPO and Paducah Site contractors are internal evaluators; all other evaluators, such as DOE Headquarters personnel and personnel from other inspecting authorities, are referred to as external evaluators in this report.

From 1996 to 2013, the United States Enrichment Corporation (USEC) operated the Paducah Site as a private company under a U.S. Nuclear Regulatory Commission (NRC) certificate of compliance and DOE

emergency management program requirements. Under the joint oversight of the NRC and DOE, the emergency management program implemented a two-level Operational Emergency classification system, designating significant HAZMAT airborne releases as either an Alert or a Site Area Emergency. Paducah's Site Area Emergencies correspond to General Emergencies, and Paducah's Alerts correspond to Alerts and Site Area Emergencies as defined by DOE Order 151.1C. When USEC returned PGDP to DOE in 2014, NRC discontinued its regulatory authority. However, in 2009, the National Nuclear Security Administration (NNSA) Director, Office of Emergency Operations (NA-40), and EM granted PPPO an exemption from DOE Order 151.1C to retain this NRC classification scheme. The exemption was intended to remain in effect for up to 24 months after the Paducah Site transitioned to a new Paducah Site deactivation and remediation contract, but remains in effect due to varying policy and direction relative to the path forward for the Paducah Site. PPPO plans to require transition of the emergency management program to full compliance with DOE Order 151.1D under a new contract. PPPO is currently drafting an implementation schedule for DOE Order 151.1D.

An effective emergency management readiness assurance program is described in Emergency Management Guide (EMG) 151.1-3, *Programmatic Elements*, as one that, in part, performs a series of evaluations using a comprehensive set of performance-based criteria for meeting performance goals provided by NA-40. DOE Order 151.1C requires the use of NA-40 issued evaluation criteria for conducting programmatic reviews and exercise evaluations under the readiness assurance program. NA-40 issued evaluation criteria in EMG 151.1-3, Appendix D, and has an ongoing effort to standardize evaluation criteria as part of the DOE Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2014-1, *Emergency Preparedness and Response*, referenced in this report as IP. Importantly, DOE's approach to developing a standard set of criteria for the IP includes EMG 151.1-3, Appendix D, by citing the evaluation criteria as baseline criteria, which are currently being piloted throughout the DOE complex. The standardized criteria, like the EMG, include criteria for exercise evaluations and programmatic reviews of all emergency management program elements. PPPO evaluators have used some EMG evaluation criteria and have participated in piloting the draft IP evaluation criteria.

Due to recent and pending contract changes that follow three- to five-year periods, the Paducah Site's readiness assurance and exercise programs are not synchronized with the review periods designated by DOE Order 151.1C. After USEC returned the Paducah Site to DOE in 2014, DOE awarded FFS a three-year contract for Paducah Site deactivation. DOE also awarded a new contract for these activities in 2017. Other recent contract changes include the turnover of Los Alamos Technical Associates Environmental Services of Kentucky, LLC activities to FFS in 2015, and MCS replacing BWXT Conversion Services, LLC (BWCS) in February 2017 at DUF6. These changes complicated the scheduling and implementation of contractor readiness assurance reviews, typically implemented over a three-year period, and exercise evaluations, implemented over a five-year period. In addition, DOE has only provided oversight of the FFS emergency management program since October 2014. The DOE requirement to evaluate exercises over a five-year period has an end date deadline of October 2019, two years after the expiration of the current FFS contract.

#### **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 review in accordance with EA's *Plan for the Office of Enterprise Assessments Assessment of Emergency Management at the Paducah Site*, April – May 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*. EA reviewed documents and databases and interviewed key personnel to collect data and draw conclusions. EA determined the effectiveness of the readiness assurance program using NA-40's definition of an effective program in EMG 151.1-3. EMG 151.1-3 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 the programmatic and exercise evaluation techniques and a system for incorporating and tracking lessons learned from training, drills, actual responses, and 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 Contractor Readiness Assurance Programs**

This section provides the results of EA's assessment of the Paducah Site contractors' emergency management activities as part of the Paducah Site readiness assurance program, as required by DOE Order 151.1C. The three major components of a comprehensive readiness assurance program are evaluations, improvements, and an ERAP. EA's evaluation was based on a systematic and comprehensive approach using a combination of programmatic and exercise evaluation criteria.

#### **5.1.1 Contractor Evaluations**

DOE Order 151.1C requires that a contractor self-assess all 15 program elements of the emergency management program annually. A comprehensive readiness assurance program that satisfies the DOE order requirements must cover all aspects (e.g., all program-specific evaluation criteria) of the emergency management program over a number of years, up to but not exceeding the five-year order requirement for validating all program elements in the formal exercise program. In addition, DOE Order 151.1C requires self-assessment reviews to include a combination of both program evaluations and exercise evaluation criteria for determining the program's effectiveness.

##### **5.1.1.1 Contractor Self-Assessments**

*Criteria:*

*DOE/NNSA facilities must implement a readiness assurance program consisting of evaluation, improvements, and ERAPs. (DOE Order 151.1C, Attachment 2, Contractor Requirements Document (CRD), 7)*



*DOE/NNSA facilities must conduct an annual self-assessment of their emergency management programs. Program and exercise evaluations (including appraisals and assessments) must be based on specific standards and criteria, issued by NA-40. Self-assessment results must be documented in the ERAP submitted to the Cognizant Field Element. (DOE Order 151.1C, Attachment 2 (CRD), 7.a.(1))*

*A comprehensive readiness assurance program validates all elements of an emergency management program over a 5-year period. (DOE Order 151.1C, Attachment 2 (CRD), 6)*

EA reviewed contractor assessment plans, schedules, procedures, assessment reports, CRADs, ERAPs, and related documentation supporting the assessment process, and also interviewed contractor personnel.

The FFS Federal Project Director Paducah informed the EA team that 415 of the criteria in Appendix D apply to the Paducah Site emergency management program. FFS contends that it has evaluated (through self-assessment or exercise evaluations) 235 of the 415 criteria, or 57%. The FFS Self-Assessment Plan shows additional assessments are scheduled to be completed for the programmatic areas shown below.

- Consequence Assessment (scheduled for 3<sup>rd</sup> Qtr. 2017)
- Protective Actions (PAs) and Reentry (scheduled for 3<sup>rd</sup> Qtr. 2017)
- Emergency Response Facilities (scheduled for 4<sup>th</sup> Qtr. 2017)
- Emergency Medical Support (scheduled for 4<sup>th</sup> Qtr. 2017)
- Emergency Public Information (scheduled for 1<sup>st</sup> Qtr. 2018)
- Termination and Recovery (scheduled for 1<sup>st</sup> Qtr. 2018).

Collectively, FFS's goal for these assessments is to address an additional 151 applicable criteria. If completed as scheduled, the Paducah contractor will have addressed 91% of the applicable criteria by the end of 1<sup>st</sup> Qtr. 2018, and will be on schedule to complete all criteria in a five-year period as required. However, this schedule extends beyond the end of the FFS contract.

EA determined that:

- Paducah Site contractors have conducted a number of self-assessments to advance program improvements including two self-assessments in 2015, seven in 2016, and five in 2017. In addition, FFS has conducted internal evaluations in accordance with corporate procedures CP2-QA-1000, *Quality Assurance (QA) Program Description*, and CP3-QA-1003, *Management and Self-Assessment*.
- FFS evaluated the USEC emergency management program for compliance with DOE Order 151.1C, Attachment 2, CRD, before turnover of the PGDP on October 21, 2014. PPPO required this evaluation. The FFS evaluation identified 12 non-compliance issues, some areas that needed further review and discussion with PPPO regarding applicability at the Paducah Site, and some other programmatic weaknesses. This assessment satisfied the defined scope and was useful in promoting improvements.
- The self-assessments that Paducah Site contractors have completed did not use the standards and criteria issued by NA-40 (see **OFI-FFS/MCS/SSI-1**).

### 5.1.1.2 Exercise Programs

#### Exercise Plans and Procedures

*Criterion:*

*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 (CRD), 6)*

EA reviewed the MCS and SSI emergency plans, the Paducah Site ERAP, and several FFS documents. The FFS documents included the site-level emergency plan, exercise procedure, five-year exercise plan, exercise evaluation objectives and criteria, and exercise plans and after-action reports (AARs) from the past three years, as well as documentation for evacuation and accountability exercises and supporting exercises. EA also interviewed the FFS emergency management program manager and supervisor.

FFS made significant improvements to the exercise program since the October 2014 contract transition by:

- Implementing the Exercise Builder tool for exercise development
- Including most of the DOE EMG 151.1-3 evaluation criteria in the Exercise Builder database
- Instituting a drill and exercise team to assist in scheduling, coordination, planning, conduct, and evaluation
- Testing all ten response elements during annual exercises
- Appropriately alternating the required annual exercises between DUF6 and PGDP facilities
- Conducting semi-annual communication system tests with DOE Headquarters and offsite agencies to fulfill the annual requirement
- Conducting annual building evacuation and accountability exercises supplemented with quarterly evaluated PA drills
- Conducting quarterly evaluated drills for the field Emergency Response Organization (ERO).

However, EA also determined that FFS ERO members were inappropriately receiving credit for demonstrating proficiency when serving as evaluators or controllers. This practice is documented in CP3-EP-1017, *Emergency Response Drills and Exercises*, and is contrary to DOE Order 151.1C, Attachment 2, 5.b.(1) (see **Deficiency** and **OFI-FFS-1**). The NA-40 Office of Plans and Policy had provided clarification that the annual demonstration of proficiency required by DOE Order 151.1C must be accomplished through performance in an actual emergency response, exercises, some forms of discussion-based exercises, evaluated drills, or limited-scope performance tests.

#### Exercise Planning, Preparation, and Conduct

*Criteria:*

*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 an 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)*

*Conduct and control exercises effectively and reliably. (DOE Order 151.1C, Attachment 2 (CRD), 6 and DOE EMG 151.1-3, 3.10, P3-36)*

EA reviewed the exercise procedure, exercise plans, and exercise briefings, and interviewed the FFS emergency management program manager and supervisor.

EA determined that FFS is adequately implementing the DOE order requirements for planning and preparing for exercises with the exception of exercise plans. FFS has planned for exercises through a structured approach designed to validate the site's integrated emergency response capability through a simulated realistic emergency event. FFS has established a drill and exercise team to coordinate exercise planning with representatives from each of the onsite contractors and participating organizations. In addition, elements of the FFS exercise plans conform to DOE order requirements by including specific objectives, timeline, inject/messages, technical data, safety and security plans, controller instructions, and evaluation criteria. Finally, EA confirmed that FFS submitted the recently reviewed exercise plans to PPPO in sufficient time before the conduct of the exercise to allow for review, comment, and approval.

Furthermore, FFS adequately prepared all participants involved in its exercises. FFS appropriately conducted general and exercise-specific training for controllers and evaluators prior to the annual exercises. During exercise-specific training, FFS reviewed safety and security plans, responsibilities, messages, and precautions and limitations in effect for the exercise. In addition, FFS provided participant briefings before the annual exercises. Finally, FFS adequately staffed the control organization to control and monitor each exercise evolution.

Nevertheless, the exercise plans did not reflect clear and accurate information to test specific response capabilities as required (see **OFI-FFS-2**). For example:

- The March 2016 exercise plan did not define the HAZMAT released. By defining the HAZMAT released, FFS would have documented a key set of related response capabilities to meet some of the elements to be validated over a five-year period.
- The October 2016 exercise plan indicated "limited" radiological assistance program (RAP) participation, as opposed to "notification only" similar to other participants listed in the plan. Limited participation could have met the three-year requirement for participation with this DOE emergency response asset. The exercise plan did not have a radiological release scenario or exercise evaluation criteria for RAP limited participation, missing an opportunity to meet the order requirement for RAP participation.
- CP3-EP-1017 complies with DOE Order 151.1C by requiring exercise plans to include relevant documentation to validate the effectiveness of corrective actions in resolving the original finding. Although FFS had past findings that were logical candidates to be evaluated during the upcoming exercises, those plans contained no objectives for validating the effectiveness of corrective actions for these past findings.

## **Exercise Evaluation and Documentation**

*Criteria:*

*Critique and evaluate exercises effectively and reliably. (DOE Order 151.1C, Attachment 2 (CRD), 6 and DOE EMG 151.1-3, 3.11, P3-40)*

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

EA reviewed the exercise procedure, exercise critique process procedure, exercise AARs from the past three years, and EM's AAR for the October 2016 exercise. EA also interviewed the FFS emergency management program manager and supervisor.

FFS effectively conducted critiques of exercise performance, maintained records, and provided lessons learned to the ERO. Controllers conducted "hotwash" critiques after each exercise to gather and document observations of participants; FFS adequately documented the critiques. In addition, FFS submitted exercise AARs to PPPO within 30 working days after the exercise to document the exercise evaluation results, and subsequently submitted exercise corrective action plans to PPPO for identified findings within 30 working days after issuing the AAR. Similarly, FFS maintained long-term records for exercises, such as exercise objectives, training records, critique summaries, and exercise-generated data, and completed exercise evaluator guides. Finally, FFS provided lessons learned identified during exercises to ERO members via sitewide bulletins and ERO training activities.

Nonetheless, contrary to DOE Order 151.1C requirements, FFS incorrectly classified some performance problems during exercise evaluations; these incorrect classifications may hinder program improvements (see **Deficiency** and **OFI-FFS-3**). Inadequate review of exercise observations against health and safety requirements for workers, responders, and the public contributes to incorrect classification of findings. For example, DOE Order 151.1C requires prompt and effective implementation of PAs to protect the health and safety of workers and the public. The FFS evaluators for the October 2016 exercise categorized problems in disseminating PAs as an improvement item rather than a finding. In contrast, the EM Office of Safeguards, Security and Emergency Preparedness evaluation categorized this problem as a finding/weakness. Categorizing this problem as an improvement item instead of a finding allowed FFS to use the emergency management departmental issues management system to informally track closure, instead of the site-level issues management system with requirements for formal review, causal analysis, and closure.

Similarly, FFS categorized several non-compliant PA-related conditions as improvement items. EA evaluated these items and found that each item is tied to key performance expectations defined in the site's emergency management plan and procedures. Due to the significance of the non-compliance, the following performance issues should have been classified as findings, which require tracking and appropriately analyzing for causes in order to establish comprehensive corrective actions, as well as for validating corrective action effectiveness, through performance demonstrations, to prevent recurrence:

- **II-EOC-01:** Emergency operations center (EOC) cadre members did not adhere to the shelter-in-place directive issued by the Incident Commander.
- **II-EOC-03:** Consideration was not given to limiting public access to the site during a shelter-in-place event.
- **II-PSS-01:** The EOC callout announcement should give consideration to the shelter-in-place directive. Consider providing alternative action/direction to the EOC cadre.
- **II-PSS-02:** The plant shift superintendent indicated that the default PA for DUF6 events is to shelter all in the Limited Area. The DUF6 facility is not in the Limited Area. The DOE offices also are located outside the Limited Area.
- **II-PSS-04:** "360 degree" PAs were not considered when responding to the scene. The response teams departing Post 15 could have potentially driven through the plume en route to the event scene.
- **II-PSS-05:** Personnel arriving on site are unaware of ongoing PAs and directives.

- **II-LED-01:** The initial PAs taken by the local emergency director at the DUF6 facility were not adequate to protect the workers in the local area.
- **II-FIRE-03:** While the site and offsite fire departments both gave consideration to the power lines at the fire incident scene, they did not coordinate with one another to have the lines de-energized.
- **II-PSS-02:** Security police officers did not follow shelter-in-place direction. Monitoring at the roadblocks did not occur.
- **II-PSS-04:** A mechanism is not in place to notify incoming personnel of PAs (shelter-in-place, accountability, etc.) upon arrival at the site.

Because these performance issues were categorized as improvement items, there are no records required for establishing corrective actions, and EA could not independently assess the effectiveness of resolution within the scope of this assessment.

### 5.1.2 Contractor Improvement Programs

DOE Order 151.1C requires site contractors to implement continuous improvement in their emergency management programs. Continuous improvement results from implementation of corrective actions from findings (e.g., deficiencies, weaknesses) in all types of evaluations, including both internal and external evaluations. Per DOE Order 151.1C, contractors must submit corrective action plans within 30 working days of receipt of the final evaluation report; revise procedures and train personnel before the next annual self-assessment; and include a verification and validation process, independent of those who performed the corrective action, to verify that the corrective action has been implemented and validate that the corrective action has been effective in resolving the original finding.

FFS and MCS each implemented their own issues management programs. CP3-QA-3001, *Issues Management*, governs FFS's program, and MCS-U-QAP-0005, *Condition Reporting*, governs MCS's program. FFS and MCS appropriately base their programs on the requirements of DOE Order 414.1D, *Quality Assurance*, and cover such aspects of issues management as operations, safety, environment, health, and security, as well as emergency management. In March 2016, FFS started an action tracking program specific to emergency management. This Emergency Management Action Tracking System covers lower-level emergency management actions, such as non-working computers, phones, and minor administration corrections, and was a significant improvement for FFS's issues management process to address these lower-level emergency management issues. CP5-EP-2000, *Emergency Management Drill and Exercise Critique Process*, governs this program.

Similarly, both FFS and MCS implemented their own lessons-learned programs. CP3-QA-3002, *Operating Experience/Lessons Learned*, adequately describes FFS's lessons-learned program, and DUF6-U-CPL-0017, *Operating Experience Program*, adequately describes MCS's lessons-learned program. FFS and MCS appropriately based their programs on the requirements of DOE Order 210.2A, *DOE Corporate Operating Experience Program*. Paducah Site contractors use both the DOE Corporate Lessons Learned database and the newer OPEXSHARE website. PPPO and Paducah Site contractors receive information from the systems, some on a daily basis, and distribute and share the information with appropriate personnel for possible action.

### 5.1.2.1 Contractor Corrective Actions

#### Criteria:

*These requirements [from DOE Order 151.1C] supplement those in the CRD to DOE Order 414.1A. Continuous improvement in the emergency management program results from implementation of corrective actions for findings (e.g., deficiencies, weaknesses) in all types of evaluations, including both internal and external evaluations. (a) Corrective action plans must be developed within 30-working days of receipt of the final evaluation report. Corrective actions must be completed as soon as possible. Corrective actions addressing revision of procedures or training of personnel should be completed before the next annual self-assessment program. (b) Completion of corrective actions must include a verification and validation process, independent of those who performed the corrective action, that verifies that the corrective action has been put in place, and validates that the corrective action has been effective in resolving the original finding. (DOE Order 151.1C Attachment 2, 7.b.(1))*

EA reviewed FFS's and MCS's issues management and corrective action programs as they relate to emergency management. EA reviewed QA and issues management procedures and corrective action plans, interviewed personnel supporting the issues management process, and reviewed three findings from a 2013 EA assessment related to a natural phenomenon event preparedness. EA analyzed the corrective actions from both internal and external management assessments, as well as AARs from the last three annual exercises.

FFS's emergency management issues and corrective action program was adequately administered in most respects:

- FFS captured and tracked numerous issues identified in assessments and exercises, and adequately administers and maintains their corrective action status.
- A screening committee categorized and prioritized issues daily. The committee assigned priority levels between 1 and 5, with 1 being the most significant and 5 being the least significant. Priority levels determined the level of effort, causal analysis requirements, and review criteria for corrective actions. Only corrective actions for level 1 and 2 issues required an effectiveness review.
- FFS consistently submitted corrective action plans for findings to PPPO within the required 30 working days.
- FFS tracked emergency management issues identified during exercises pertaining to other onsite contractors in the FFS QA issues management program.

However, for all findings identified during exercises and assessments, FFS did not independently verify and validate corrective actions as required. For example, FFS performed an assessment in fall 2014 to identify any gaps in compliance in the USEC emergency management program before the contract transition. This assessment identified 12 areas of non-compliance with DOE Order 151.1C. FFS categorized these findings as closed but did not verify or validate the effectiveness of the corrective actions in resolving the original findings. In addition, FFS did not apply DOE Order 151.1C closure requirements to all emergency management findings. In another example, FFS issued a total of 34 findings from exercises (28) and assessments (6) performed from fiscal year (FY) 2015 to the time of this EA assessment. These findings were prioritized as level 3, 4, or 5, for which CP3-QA-3001 did not require verification and validation that the corrective actions have been effective in resolving the original findings. EA attributes the absence of an effectiveness review for these emergency management corrective actions to the lack of implementing instructions in FFS's CP3-QA-3001 procedure to perform

the DOE Order 151.1C required verification and validation for level 3 to 5 emergency management findings (**Deficiency**).

In addition, the procedure does not address DOE Order 151.1C requirements regarding the timeliness of corrective action plans and assurance that the problems were actually corrected. For example, one priority level 3 to 5 finding that was not effectively closed involved the use of the National Atmospheric Release Advisory Center (NARAC) dispersion model to predict HAZMAT plumes. FFS identified this finding during an assessment in November 2015; subsequently, FFS developed procedures, conducted training, and closed the finding in December 2015. During the March 2016 exercise, FFS issued improvement item II-TAG-01, stating that the NARAC software failed three times during the exercise. FFS closed this finding in June 2016. In the October 2016 exercise, FFS issued finding F-TAG-01, stating that plume modeling was incorrect due to human error in choosing the correct physical form of the chemical. FFS closed this October 2016 finding without performing an effectiveness review, which might have identified additional corrective actions necessary to prevent recurrence. Although FFS applied significant effort since 2015 in making the NARAC tool its primary consequence assessment tool, persistent issues made the use of NARAC less than fully effective.

FFS did not adequately perform verification and validation of some emergency management correction actions as required, resulting in the recurrence of performance problems. FFS's issues management procedure, CP3-QA-3001, did not require a verification and validation process for all emergency management findings (DOE Order 151.1C, Attachment 2, 6.b(7) and 7.b(1)(b)) (**Deficiency**).

#### **5.1.2.2 Corrective Actions for Past EA Findings**

EA followed up on its 2013 natural phenomena event assessment at the Paducah Site, focusing on the status of the three findings. In that report, EA concluded that deficiencies in the integration and coordination of individual facility emergency management programs negatively impacted the Paducah Site's ability to plan response to and recovery operations from severe natural phenomena events, that no provisions had been established for use of an alternate location if the primary command center is not available, and that the individual DOE contractor and USEC emergency management activities had not resulted in a fully comprehensive and integrated Paducah Site emergency management program. All three findings were closed.

In assessing the closure of these findings, EA found that the first finding was no longer applicable and that the third finding was outside the scope of this assessment. For the second finding, EA determined that FFS appropriately established an alternate EOC in 2016 at the Kevil Fluor facility, approximately 4.5 miles southwest of the Paducah Site. The alternate EOC is a dedicated EOC space and contains all of the same equipment and procedures as the primary EOC. FFS closed the action item for the alternate EOC in May 2016 after an open house and tour of the facility, where attendees were required to sign an attendance sheet. However, no emergency management exercise has been performed from the alternate EOC. FFS had not validated the effectiveness of the alternate EOC (**Deficiency**).

According to PPPO-M-414.1-7G, *Quality Assurance Program Plan*, PPPO is required to place findings from EA into its Management Tracking System (MTS) program. PPPO did not enter the three findings from 2013 in the MTS program (see **OFI-PPPO-2**). PPPO reported these items as closed in its 2016 ERAP, after appropriate input from FFS.

### 5.1.2.3 Lessons-Learned Programs

*Criterion:*

*The readiness assurance program must include a system for incorporating and tracking lessons learned from training, drills, and actual responses, as well as a sitewide lessons-learned program. DOE/NNSA contractor-operated facilities must participate in the DOE/NNSA corporate lessons learned program. DOE-STD-7501-99, The DOE Corporate Lessons Learned Program, provides guidance on use of the system. (DOE Order 151.1C, Attachment 2 (CRD), 7.b.(2))*

EA reviewed FFS's and MCS's lessons-learned program. EA reviewed lessons-learned procedures; interviewed lessons-learned personnel and the Office of Environment, Health, Safety and Security database administrator; and reviewed the lessons-learned databases.

The Paducah Site actively participates and effectively distributes lessons learned to appropriate site personnel. The site uses the newer OPEXSHARE operating website in addition to the DOE Corporate Lessons Learned database. Specifically:

- PPPO and Paducah Site contractors actively used DOE's Corporate Lessons Learned database to receive complex-wide lessons learned.
- FFS, MCS, and PPPO also subscribed to the newer OPEXSHARE operating experience and lessons-learned website.
- The three organizations received information from the DOE Corporate Lessons Learned database and OPEXSHARE website, some on a daily basis, and distributed and shared the information to the appropriate personnel within their organizations and across site organizations.
- QA specialists forwarded reports specific to emergency management to the appropriate individuals in the emergency management department for evaluation and analysis for applicability to the Paducah Site.
- Some emergency management department personnel also subscribe to the OPEXSHARE website directly.
- FFS hosted the coordinator of the OPEXSHARE website in September 2015 to provide advanced, hands-on training on the website and its uses.
- The Office of Environment, Health, Safety and Security database administrator of the DOE Corporate Lessons Learned database confirmed that FFS personnel had logged into and used the database.

Despite many lessons learned being distributed, FFS had not made any enhancements to emergency management processes or procedures in three years related to lessons-learned insights. FFS had not implemented processes or procedure changes prompted by the DOE Corporate Lessons Learned database or OPEXSHARE website information. For example, some of the same issues identified in EA's 2015 lessons-learned report, such as not assessing all program elements and not performing effectiveness reviews of corrective actions, exist at the Paducah Site, as documented in this report.

Furthermore, PPPO and the contractors missed opportunities to provide lessons learned to the DOE Corporate Lessons Learned database or the OPEXSHARE website, such as the December 2014 battery room fire and the November 2016 grassland fire.



### 5.1.3 Emergency Readiness Assurance Plan

#### Criteria:

*Facilities and offsite transportation activities must submit an ERAP to the Cognizant Field Element by September 30 of each year. In keeping with 31 U.S.C. 1115 and 1116, this report must identify what the goals were for the FY that ended, coincident with the due date for this report (e.g., September 30), and the degree to which these goals were accomplished. This report must also identify the goals for the next FY (which starts on October 1). (DOE Order 151.1C, Attachment 2 (CRD), 7.c.)*

*DOE/NNSA facilities must participate in a program of performance indicators (including performance measures and metrics) to capture and track objective data regarding the performance of emergency management programs in key functional areas. (DOE Order 151.1C, Attachment 2 (CRD), 7.a.(3))*

EA reviewed contractor ERAPs, performance measures and metrics, exemptions, plans, procedures, assessment reports, and related documentation supporting the ERAP process and interviewed contractor personnel.

The Paducah Site contractors and PPPO are adequately submitting the annual ERAPs that include prescribed performance indicators. All Paducah Site contractors provided appropriate input to the annual ERAPs, based on ERAP guidance issued by NA-40; FFS combined the individual contractor input and submitted a consolidated contractor ERAP to PPPO by September 30 for each of the last three years. PPPO further consolidated major activities and summarized significant site activities for both the Portsmouth and Paducah Site in its annual submittals. All PPPO and contractor ERAPs accurately followed the format issued by NA-40, and PPPO included the consolidated contractor ERAPs with their annual ERAP submittals to EM and NA-40. Generally, the FY 2014-2016 ERAPs documented that the Paducah Site emergency management programs were evolving and providing an acceptable level of readiness.

Nevertheless, the ERAPs were not fully used as a management tool in conveying all requested information and represent a missed opportunity to share important information related to equipment requirements that were not included in the FY 2016 operational budget or any additional equipment requirements for the DOE Paducah Site for FY 2017. These omissions included funding deficits for an EOC information management system and replacement of critical fire department equipment, including a 1987 fire pumper, 1982 aerial platform, and two ambulances (1990 and 1997), all of which have exceeded National Fire Protection Association life expectancy criteria for equipment (see **OFI-FFS/MCS/SSI-2**).

The ERAPs appropriately conveyed other significant changes in the Paducah Site emergency management programs, including the status of previous DOE Order 151.1C exemptions relative to classification of Operational Emergencies (remaining from NRC-regulated USEC operations). However, the rationale no longer exists for PPPO to extend the Paducah Site contractor exemption relative to event classification requirements. The exemption, approved by NA-40 and EM on July 15, 2009, continues the two-tiered NRC event classification system (Alert and Site Area Emergency) instead of using the three categories required by DOE Order 151.1C (Alert, Site Area Emergency, General Emergency). Importantly, NRC no longer has regulatory oversight since the turnover of the Paducah Site on October 21, 2014. PPPO plans to eliminate this exemption and coordinate the action, along with the implementation of DOE Order 151.1D, as part of the new Paducah Site deactivation and remediation contract. The statement of work in the request for proposal called for the emergency management program to come into full compliance with DOE Order 151.1D, eliminating the exemption within 24 months after the contract is awarded (see **OFI-PPPO-2**).

#### **5.1.4 Contractor Readiness Assurance Programs Conclusion**

PPPO has appropriately required each contractor to develop a comprehensive emergency readiness assurance program that provides assurance that emergency plans, implementing procedures, and resources are adequate and sufficiently maintained, exercised, and evaluated. The individual FFS, MCS, and SSI emergency readiness assurance programs established the three major components: evaluations, improvements, and an ERAP. In addition, FFS, MCS, and SSI appropriately included the required major components for evaluations, performed internal emergency management evaluations in accordance with their respective corporate procedures, and performed numerous self-assessments since October 2014.

Paducah Site contractors conducted a number of self-assessments to advance program improvements. However, emergency management self-assessments did not consistently use the required specific standards and criteria issued by NA-40, or omitted specific criteria, thereby reducing the effectiveness of many assessments performed by Paducah Site contractors. In addition, Paducah Site contractors have not performed comprehensive annual self-assessments for all key program elements in accordance with the DOE order requirement.

FFS made significant improvements in the exercise program since October 2014, such as implementing the Exercise Builder tool for exercise development and instituting a drill and exercise team for exercise planning, conduct, and evaluation. In addition, FFS effectively conducted offsite communication tests and annual building evacuation exercises. Furthermore, FFS planned and effectively prepared for exercises through a structured approach designed to test the site's integrated emergency response capability through a simulated realistic emergency event. Finally, FFS effectively conducted critiques of exercise performance, maintained records, and provided ERO lessons learned.

However, the FFS exercise program exhibited problems with exercise evaluation. FFS did not appropriately classify some performance issues from exercise evaluations. Contributing causes of this condition include an incomplete set of evaluation criteria, incomplete tracking of evaluation criteria, and inadequate review of exercise observations against DOE Order 151.1C health and safety requirements for workers, responders, and the public.

All Paducah Site contractors provided adequate performance indicator information (including performance measures and metrics) in their annual ERAP submissions to capture and track objective data on the performance of emergency management programs in key functional areas requested by NA-40. Nevertheless, the ERAPs were not fully used as a management tool in conveying all requested information and represent a missed opportunity to share important information related to equipment requirements that were not included in the FY 2016 operational budget or any additional equipment requirements for the DOE Paducah Site for FY 2017.

Overall, FFS's improvement programs were adequate except for one issue. FFS did not validate the effectiveness of corrective actions for findings resulting from exercises and assessments as required by DOE Order 151.1C. FFS did not adequately address one past EA finding, in that the alternate EOC has never been used in an exercise. Also, while the Paducah Site participates in the required DOE Corporate Lessons Learned database and in the newer OPEXSHARE website, this information has not prompted emergency management changes, and the site has not historically provided any information to the corporate systems.

#### **5.2 PPPO Readiness Assurance Program**

EA assessed PPPO's activities related to the Paducah Site readiness assurance program, including approval and submittal of ERAPs to DOE Headquarters, review of contractor emergency management

programs, review of contractor self-assessment programs, self-assessments of PPPO's response readiness, and PPPO improvement processes.

### **5.2.1 PPPO Evaluations**

PPPO, as the Cognizant Field Element, must conduct oversight assessments of facility emergency management programs at least once every three years, review contractor self-assessment programs annually, perform annual field element self-assessments of PPPO emergency management program responsibilities and capabilities, and approve and distribute ERAPs to NA-40 and EM. NA-40 provides generic and program-specific evaluation criteria for performing a comprehensive and systematic evaluation of all programmatic and response elements of the DOE emergency management program. NA-40 also provides instructions for developing site-specific criteria from the generic evaluation criteria to address site-specific hazards, plans, and procedures. NA-40's guidance provides a systematic and comprehensive approach for determining whether an emergency management program is compliant and effective in implementing DOE directives and policy, using a combination of program and exercise evaluation criteria.

#### **5.2.1.1 PPPO Oversight**

##### **PPPO 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 submittal correspondence from the past three years and interviewed PPPO personnel, and concluded that PPPO is effective in approving and submitting ERAPs for inclusion in the DOE annual report. PPPO performs reviews and approvals of Paducah Site ERAPs and makes the required distributions of the reports. PPPO approves a consolidated ERAP covering PPPO and all Portsmouth and Paducah Site prime contractor emergency management programs. PPPO submits the approved ERAP to EM and NA-40 in time for inclusion in the DOE annual report on the status of the emergency management system.

##### **PPPO Evaluations**

*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 PPPO assessment plans, procedures, schedules, reports, and CRADs, and interviewed PPPO personnel.

PPPO's plans and procedures lack specificity regarding the scope of an emergency management program assessment and the required evaluation criteria for determining the level of compliance and effectiveness of the program. PPPO establishes general guidance for emergency management assessments in its oversight program plan, PPPO-M-226.1-2, *Oversight Program Plan*, which is used as guidance for performing oversight of eight focus areas. Facility safety is one of the eight focus areas, consisting of

safety basis and emergency management. The *Oversight Program Plan* provides adequate guidance for scheduling, staffing, conducting, and recording the results of oversight assessments of the Paducah Site contractors and integrates assessment activities and corrective actions, with further instructions provided in procedure PPPO-2533131, *Assessment and Surveillance Process*, and PPPO-M-414.1-1, *Corrective Action Program*. The *Oversight Program Plan* requires a review of the emergency management program at least once every three years and the use of a CRAD or a stated equivalent. However, the *Oversight Program Plan* and the *Assessment and Surveillance Process* procedure do not specify what constitutes a comprehensive emergency management review (e.g., the number of program elements or contractor programs within the scope of the three-year review) or invoke the use of the NA-40 evaluation criteria as required by DOE Order 151.1C, I. 9.c.(3) and I.9.m. These omissions limit the effectiveness of PPPO oversight of the emergency management programs at the Paducah Site (see **Finding F-PPPO-1** and **OFI-PPPO-1**).

PPPO completed a partial review of the Paducah Site emergency management program in the past three years. With the support of Professional Project Services, Inc., PPPO conducted two reviews (November 2015 and October 2016) focused on the FFS portion of the Paducah Site emergency management program as part of the most recent three-year readiness assurance review. PPPO assessed some programmatic elements in November 2015 and assessed the FFS program using 77 lines of inquiry derived from the DOE Order 151.1C CRD. PPPO identified 3 findings and 13 observations. FFS self-identified all but three observations and tracked all items in the FFS issues management system, so no further PPPO action was required. Also, PPPO assessed some response elements during the October 2016 site-level exercise. PPPO has not issued a report for the October 2016 exercise, but the PPPO CRAD defines the scope of the review as addressing FFS activities and uses some of the draft IP baseline CRAD criteria. The CRAD lists 20 lines of inquiry as criteria, taken from the draft IP baseline CRAD. Collectively, these two PPPO assessments do not comprehensively evaluate the Paducah Site emergency management program (see **Finding F-PPPO-1** and **OFI-PPPO-1**).

PPPO has not reviewed contractor self-assessments of the emergency management programs in the past three years. Therefore, PPPO does not effectively ensure compliance with DOE directives and policy through annual reviews of contractor self-assessment reports as required by DOE Order 151.1C, I. 9.c.(3) and I.9.m, which limits PPPO from being fully effective in oversight of the emergency management programs at the Paducah Site (see **Finding F-PPPO-1**).

#### **5.2.1.2 PPPO 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 the PPPO assessment schedule, a self-assessment report from 2010, the CRAD for a 2016 self-assessment, and ERAPs for the past three years, as well as interviewed PPPO personnel.

PPPO performed a self-assessment in December 2016 (the only self-assessment in the past three years) but had not sufficiently developed the report, and it was not available for EA's review. PPPO's last completed self-assessment, in 2010, reported no findings and two observations. Because PPPO has not completed any self-assessment in the past three years as required by DOE Order 151.1C, I. 9.c.(3), no results have been recorded in the Field Element portion of the ERAPs (see **Finding F-PPPO-1**).

## 5.2.2 PPPO Improvement Program

### *Criteria:*

*A strategic objective of an emergency management readiness assurance program is continuous improvement. A strong, reliable readiness assurance program will help an organization ensure that appropriate and timely improvements are made in response to identified needs and will provide the organization with a direction and a path forward to achieve an effective and efficient emergency management program. (DOE EMG 3-1, Section 4.4)*

*An improvement program provides assurances that appropriate and timely improvements are made in the emergency management program in response to needs identified through coordinated emergency planning, resource allocation, program assistance activities, evaluations, training, drills, and exercises. (DOE EMG 151.1-3, P5.9)*

EA reviewed the PPPO corrective action program procedure (PPPO-M-414.1-1) and the PPPO MTS database entries, and interviewed PPPO evaluators and the program analyst responsible for updating the database.

PPPO's MTS is adequate for tracking PPPO's corrective actions resulting from PPPO or external assessments of emergency management. PPPO also uses the database to enter findings for PPPO action and to track PPPO findings from oversight assessments of contractor programs that were not self-identified by the contractor. The database contains two open Paducah Site emergency management program findings for PPPO action. A DOE Facility Representative identified the findings during a September 2016 management assessment. One finding was for incomplete annual refresher training for some DOE Facility Representatives on the ERO, and the other was for not providing the plant shift superintendent with an up-to-date ERO duty roster. FFS completed the corrective actions for both of these findings in November 2016, but MTS was not updated (see **OFI-PPPO-2**). Once aware of the open status of these findings, PPPO initiated collection of evidence to support closure.

The PPPO corrective action program procedure has not been revised since March 2010, provides some outdated information, and is incomplete. Outdated information includes requiring the use of the DOE Headquarters corrective action tracking system, referring to an EA predecessor organization instead of EA, and requiring the use of a previously used PPPO database, the QA Tracking System, rather than MTS. The procedure does not provide instructions on the types of causal analysis required for the various levels of deficiencies and weaknesses, and does not require the use of independent personnel to perform corrective action verification and validation for emergency management findings (see **OFI-PPPO-2**).

In the past three years, PPPO and external oversight assessments have not identified any findings or opportunities to improve PPPO emergency response and capabilities. As previously discussed, the only PPPO self-assessment during this period was initiated in October 2016, and the assessment report is still under development. Therefore, PPPO has entered no findings from PPPO readiness assurance program self-assessments or external oversight assessments into its corrective action program in the past three years. As a result, the effectiveness of the readiness assurance program to improve PPPO's preparedness and response capabilities was not evaluated.

PPPO has not had to use its corrective action program to track findings it issued for problems in the contractors' emergency response and capabilities in the past three years. For example, PPPO's November 2015 assessment of the FFS emergency management program identified three findings, which FFS had also self-identified and entered into the FFS corrective action program. Therefore, per the corrective

action program procedure, PPPO had no need to enter the findings for FFS actions into the PPPO corrective action program.

### **5.2.3 PPPO Readiness Assurance Program Conclusion**

Overall, PPPO reviews, approves, and distributes ERAPs effectively and has the framework for making program improvements, but PPPO does not perform all required evaluations. To support program improvements, PPPO has an adequate database to track corrective actions, a dedicated program analyst, and a corrective action program procedure. However, the database is not current for emergency management issues submitted by a DOE Facility Representative, and the program procedure is outdated and incomplete. Most significantly, the program procedure does not identify the different types of causal analysis for different significance levels of issues and does not require independent verification and validation for closing findings. The PPPO improvement process is used rarely, partly because it is not used for issues already in a contractor's issues management process and partly because PPPO has not performed comprehensive self-assessments to identify deficiencies and weaknesses. Finally, PPPO has not conducted a full evaluation of contractor emergency management programs over a three-year period, reviewed contractor self-assessment programs annually, or performed annual assessments of the PPPO emergency management program as required by DOE Order 151.1C, thereby limiting PPPO's ability to determine whether the Paducah Site emergency management program is effective in implementing DOE directives and policy.

## **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.

### **Portsmouth/Paducah Project Office**

**Finding F-PPPO-1:** PPPO assessments are not effective in improving the emergency management program. PPPO does not perform complete evaluations of contractor emergency management programs over a three-year period, review contractor self-assessments annually, or conduct assessments of the PPPO emergency management program annually as required by DOE Order 151.1C, I. 9.c.(3) and I.9.m.

## **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.

## **Fluor Federal Services, Inc.**

**OFI-FFS-1:** To improve ERO annual proficiency demonstration, consider:

- Scheduling the appropriate form of discussion-based exercises, evaluated drills, or limited-scope performance tests to permit ERO members to perform their respective response tasks
- Eliminating the CP3-EP-1017 exemption that allows performance of controller or evaluator functions to fulfill proficiency demonstration requirements
- Reviewing drill and exercise schedules to determine whether primary and alternate ERO members have enough opportunities to practice their response tasks.

**OFI-FFS-2:** To improve exercise plan development, consider:

- Following the exercise design process within Exercise Builder
- Providing additional detail in exercise plans to ensure adequate documentation of the exercise related to documenting the achievement of order requirements, such as HAZMAT used in the exercise and the level of participants' participation
- Including relevant information in the exercise plans to help validate that the corrective actions have resolved the original findings from past exercises.

**OFI-FFS-3:** To promote effective and reliable exercise evaluations, consider:

- Using evaluators from offsite sources who have appropriate experience for the area they evaluate
- Providing training for evaluators on the use of evaluation criteria and other tools, and promoting critical assessments
- Minimizing the use of evaluators to perform controller functions
- Reviewing exercise evaluation observations in light of health and safety requirements from DOE Order 151.1C
- Identifying all response capabilities to be evaluated over a five-year period
- Including items omitted from the criteria database or developing a written rationale for omission:
  - Command post habitability
  - Mass casualty responses
  - Defining decision-making duties between the crisis manager and incident commander
  - Incident command national incident management system organizational sectors
  - Information submitted in situation reports
  - Consequence assessments using real-time NARAC
  - Implementation of PA guides
  - Decontamination facility
  - Alternate joint information center
  - Evaluator organization staffing
- Using the same numbering system established in DOE EMG 151.1-3 to identify evaluation criteria
- Using all evaluation criteria within the Exercise Builder tool over a five-year period to ensure a comprehensive evaluation of response capabilities
- Establishing a matrix for tracking exercise evaluation criteria over a running five-year period
- Establishing a five-year plan that projects five years into the future

- Using sufficiently detailed site-specific emergency action levels, procedures, manuals, handbooks, and other protocols as the basis for determining a correct response, and incorporating the actions into site-specific evaluation criteria
- Using Exercise Builder evaluator checklists to incorporate procedure-based actions to support evaluation criteria, instead of modifying the DOE EMG 151.1-3 criteria.

**Fluor Federal Services, Inc., Mid-America Conversion Services, LLC, and Swift and Staley Incorporated**

**OFI-FFS/MCS/SSI-1:** Consider improving evaluation efficiency and the effectiveness of emergency management self-assessments by:

- Implementing the complete set of objectives and programmatic assessment criteria published in the DOE EMG (DOE Guide 151.1-3)
- Providing a documented rationale for any EMG assessment criteria that are not adopted for use in the assessment program
- Tailoring the EMG generic exercise evaluation criteria to produce measurable standards that are based on Paducah Site emergency plans and procedures
- Incorporating criteria from the DOE Order 151.1C “frequently asked questions” responses and DOE policy memoranda into the assessment criteria, as appropriate
- Dividing the program elements further into more than 15 program element self-assessments so that the scope of the annual self-assessment of each element need not include all aspects of the associated programmatic or response tasks
- Revising the site self-assessment program to increase the scope of the programmatic assessments to better complement exercise evaluations
- Forming a task team with representatives from PPPO, FFS, MCS, and SSI to tailor a single Paducah Site emergency management CRAD to ensure that all organizations use the same standard when looking at the same element. The resulting CRAD should incorporate Appendix D of DOE Guide 151.1-3.

**OFI-FFS/MCS/SSI-2:** Consider improving the ERAP’s effectiveness as a management tool by providing detailed information on an annual basis about how continuous improvement in the emergency management program is (or is not) being achieved and how the complementary tools of program and exercise evaluations are being used to ensure that the emergency management program is ready to respond. This information should include the usual internal evaluations, along with data collected from various observations, performance indicators, and monitoring activities over the course of the year.

**Portsmouth/Paducah Project Office**

**OFI-PPPO-1:** To improve the effectiveness of PPPO’s evaluations of contractor emergency management programs, consider revising PPPO-M-226.1-2 and/or PPPO-2533131 to:

- Identify all contractors by company name that PPPO will review within the three-year period.
- Require the use of specific criteria issued by NA-40 for readiness assurance reviews.
- Require a PPPO review of all contractor emergency management self-assessments annually.
- Require PPPO to review the Self-Assessment Plan developed by FFS as identified in the Background section to ensure full implementation of the plan.



**OFI-PPPO-2:** To improve the effectiveness of the PPPO corrective action program, consider revising PPPO-M-414.1-1 to:

- Delete the references to the DOE corrective action tracking system and the PPPO QA tracking system.
- Require the use of the PPPO MTS database for tracking PPPO findings.
- Require notification of the responsible personnel when nearing corrective action plan due dates and when such plans become overdue.
- Require periodic reviews of MTS entries to verify the status of corrective action plans and database information.
- Establish categories for findings, aligned with the appropriate levels of causal analysis.
- Require verification and validation of emergency management finding closures by personnel independent of those implementing corrective action plans.

## **Appendix A Supplemental Information**

### **Dates of Assessment**

Onsite Assessment: April 11 – May 11, 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  
Thomas R. Staker  
William E. Miller  
Michael A. Kilpatrick

### **EA Site Lead for the Paducah Site**

Robert E. Farrell

### **EA Assessors**

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

## **Appendix B**

### **Key Documents Reviewed and Interviews**

#### **Documents Reviewed**

- C-MA-15-SSEP-001, *Management Assessment Report: BWCS Emergency Management Program for Paducah DUF6 Facilities*, Rev 0, 1/30/2015
- C-MA-16-SSEP-001, *Management Assessment Report: BWCS Emergency Management Program for Paducah DUF6 Facilities*, Rev 0, 3/11/2016
- C-MA-17-SSEP-001, *Management Assessment Report: BWCS Emergency Management Program for Paducah DUF6 Facilities*, Rev 0, 1/24/2017
- CP2-EP-1000, *Paducah Site Emergency Management Plan*, Rev. 1, 09/2016
- CP3-EP-1017, *Emergency Response Drills and Exercises*, Rev. 0, 11/5/2015
- CP5-EP-1005, *PGDP Deactivation and Remediation Contractor 5 Year Formal Exercise Program*, Rev. 1, 3/28/2017
- CP2-QA-1000, *QA Program Description*, Rev. 2, 08/2016
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#### **Interviews**

- FFS Emergency Management Program Manager
- FFS Emergency Management Supervisor

- FFS QA Specialist
- MCS Emergency Manager
- MCS Emergency Management Program Specialist
- MCS QA Specialist Occurrence Reporting and Processing System and Operating Experience Programs Manager
- PPPO Emergency Management Specialists (2)
- PPPO Program Analyst
- PPPO QA Specialist
- SSI Emergency Management Program Specialist

## **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.

- FFS ERO members were inappropriately receiving credit for demonstrating proficiency when serving as evaluators or controllers. This practice is documented in CP3-EP-1017, *Emergency Response Drills and Exercises*, and is contrary to DOE Order 151.1C, Attachment 2, 5.b.(1).
- FFS has not appropriately classified some performance weaknesses as findings during exercise evaluations, as required by DOE Order 151.1C.
- FFS has not adequately performed verification and validation of some emergency management correction actions as required, resulting in the recurrence of performance problems. FFS's issues management procedure, CP3-QA-3001, *Issues Management*, does not require a verification and validation process for emergency management findings. DOE Order 151.1C, Attachment 2, 6.b(7) and 7.b(1)(b) requires verification and validation of corrective actions for all emergency management findings (e.g., deficiencies and weaknesses).
- PPPO does not perform a verification and validation process of emergency management issues, independent of those who performed the corrective action, that validates that the corrective action has resolved the original finding, as required by DOE Order 151.1C, X.3.b.(3).