



Lessons Learned from Assessments of Emergency Management Programs at U.S. Department of Energy Sites During Fiscal Years 2022-2024

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Office of Enterprise Assessments
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Acronyms

| | |
|---------|--|
| CAS | Contractor Assurance System |
| CNS | Consolidated Nuclear Security, LLC |
| COPS | Common Operating Picture System |
| CRAD | Criteria and Review Approach Document |
| DOE | U.S. Department of Energy |
| EA | Office of Enterprise Assessments |
| EM | Office of Environmental Management |
| EMInS | Emergency Management Information System |
| EOC | Emergency Operations Center |
| EOS | Emergency Operations System |
| EPHA | Emergency Planning Hazards Assessment |
| ERAP | Emergency Readiness Assurance Plan |
| ERO | Emergency Response Organization |
| FE | DOE Field Element |
| FY | Fiscal Year |
| GIS | Geographic Information System |
| LANL | Los Alamos National Laboratory |
| M&O | Management and Operating |
| NNSA | National Nuclear Security Administration |
| SC | Office of Science |
| Triad | Triad National Security, LLC |
| WebEOC® | Web-based Emergency Operations Center Software |

LESSONS LEARNED FROM ASSESSMENTS OF EMERGENCY MANAGEMENT PROGRAMS AT U.S. DEPARTMENT OF ENERGY SITES DURING FISCAL YEARS 2022-2024

Executive Summary

This lessons learned report summarizes the results of assessments of emergency management programs conducted by the U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) during fiscal years 2022 through 2024. This report provides conclusions and recommendations to inform DOE senior management on opportunities to improve emergency management throughout the enterprise. All assessments were conducted using DOE Order 151.1D, *Comprehensive Emergency Management System*, to evaluate the effectiveness of emergency management programs at DOE hazardous material facilities and their associated field office oversight methodologies.

All assessed sites reported that compliant and effective programs were in place based on compliance-focused annual self-assessments and metrics. The following strengths were identified in emergency management programs:

- Most sites had core emergency operations system capabilities to collect incident information and to provide needed expertise for incident analysis from a centralized, well-equipped emergency operations center, and required the emergency operations system be consistent with the operational concepts of the National Incident Management System
- All sites had a site-level composite emergency response organization structure consisting of an integrated line and staff organization that responds to all emergency incidents within the site boundary commensurate with the associated hazards and threats identified in the all-hazards planning basis.
- Most DOE field elements and management and operating (M&O) contractors adequately identified the necessary onsite capabilities and offsite interfaces required to respond to incidents consistent with the technical planning basis. In addition, most M&O contractors tested and validated the site-level emergency response organizations annually as required and site-level specialized teams over a rolling five-year period.

In addition, several best practices that provide an innovative approach or method to improve effectiveness or efficiency of emergency management programs are identified and discussed in section 4.0.

EA also identified weaknesses in readiness assurance, situational awareness and common operating picture, emergency response capabilities, and issues management as identified below. Senior management attention is needed to address the following DOE enterprise emergency management weaknesses:

- Most sites limit their self-assessments of implementation of DOE Order 151.1D, *Comprehensive Emergency Management System*, to compliance with Order requirements rather than conducting performance-based evaluations that measure the effectiveness of personnel and capabilities in responding to an incident. Consequently, site-specific readiness determinations reported may have been overstated.
- The rigor of site-specific readiness assurance programs differs considerably across the DOE enterprise.

- Most DOE field elements have not provided adequate direction to ensure the implementation of an effective concept of operations and a common operating picture during an emergency, which has diminished the effectiveness of the overall emergency response during exercises.
- Many DOE field elements have not adequately ensured the readiness of emergency response capabilities identified by the site as needed to protect the health and safety of workers and the public for analyzed incidents.
- At several sites, M&O contractor corrective actions did not effectively prevent recurrence of EA identified issues, including previously identified findings.
- Site M&O contractor exercise evaluators typically did not identify all relevant issues.

Recommendations

The recommendations identified in this lessons learned report for DOE field element managers and M&O contractors are summarized below and are more fully described in section 5.0.

Readiness Assurance

DOE field element managers and M&O contractors should develop and implement a performance-based exercise assessment process that includes a structured tool for comprehensively evaluating the effectiveness of emergency response capabilities based on site-specific hazards.

Situational Awareness and Common Operating Picture

DOE field element managers should address weaknesses related to a common operating picture by strengthening site-specific emergency plans, emergency plan implementing procedures, checklists, and other command media to add and implement requirements for ensuring and maintaining situational awareness across response venues.

Emergency Response Capabilities

DOE field element managers should ensure that site M&O contractors maintain and validate the readiness of site-specific emergency response capabilities over a rolling five-year period.

Issues Management

DOE field element managers and M&O contractors should improve issues management processes to ensure that corrective actions resolve the identified weaknesses and effectively prevent recurrence.

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1.0 INTRODUCTION

From fiscal year (FY) 2022 to August 2024, the U.S. Department of Energy (DOE) Office of Emergency Management Assessments within the independent Office of Enterprise Assessments (EA) conducted 21 independent assessments of emergency management programs across DOE, including National Nuclear Security Administration (NNSA), Office of Environmental Management (EM), Office of Science (SC), Office of Nuclear Energy, and Office of Fossil Energy and Carbon Management sites. These assessments evaluated the effectiveness of DOE field elements (FEs) and site management and operating (M&O) contractors in managing and maintaining the sites’ emergency management programs. The assessments also evaluated the effectiveness of and DOE/NNSA Headquarters oversight of emergency management programs. This lessons learned report identifies best practices, common weaknesses, and recommendations from these assessments to promote organizational learning and improve performance throughout the DOE complex.

2.0 METHODOLOGY

EA implements DOE’s independent oversight program. This program is designed to enhance DOE safety and security programs by providing the Secretary and Deputy Secretary of Energy, Under Secretaries of Energy, DOE managers, senior M&O contractor managers, Congress, and other stakeholders with an independent evaluation of the adequacy of DOE policy and requirements, as well as the effectiveness of DOE and M&O contractor line management performance, risk management in safety and security, and other critical functions as directed by the Secretary. DOE Order 227.1A, *Independent Oversight Program*, describes and governs the DOE independent oversight program. EA implements the program through a comprehensive set of internal protocols operating practices, assessment guides, and process guides.

This report reflects an analysis of the collected results of EA’s assessments of various aspects of site emergency management programs during FYs 2022 through 2024 using EA CRAD 33-09, Rev.0, *DOE O 151.ID Emergency Management Program Criteria and Review Approach Document*. Selected elements of the emergency management program were evaluated, including emergency response capabilities, plans and procedures, the technical planning basis, and exercises and issues management under readiness assurance. Table 1 lists the types and numbers of assessments performed.

Table 1. Summary of EA Assessments

| Assessment Type | Number of Assessments |
|--|-----------------------|
| Emergency Management Exercise Evaluation | 6 |
| Emergency Preparedness Capability | 4 |
| Technical Basis | 5 |
| Programmatic | 4 |
| Focused | 2 |
| Total | 21 |

The assessment types are described below:

- Emergency management exercise evaluations are performance-based and assess the effectiveness of the emergency response organization's (ERO's) response to hazardous material release exercise scenarios and the site's ability to plan, execute, and evaluate the response, consistent with the emergency management program technical basis, in a manner that identifies weaknesses and leads to program improvements.
- Emergency preparedness capability assessments evaluated the readiness of site-specific emergency response capabilities to protect the health and safety of workers, responders, and the public for any analyzed incident.
- Technical basis assessments evaluated the effectiveness of sites in developing and maintaining the all-hazards planning basis that serves as the basis for the hazardous material program, including transuranic waste operations.
- Programmatic assessments evaluated the effectiveness of sites in managing and maintaining an emergency management program in accordance with DOE order requirements.
- Focused assessments evaluated specific areas of emergency management order compliance. Of the two focused assessments reviewed, one evaluated the resolution of EA emergency management findings previously identified at eight NNSA and EM sites. The other assessment evaluated the effectiveness of EM, NNSA, and SC program offices in implementing their oversight requirements of DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, and the implementation of those processes by selected FEs.

Appendix A lists the contributors to this lessons learned effort, the members of the Quality Review Board, and the EA management responsible for this evaluation. The EA assessment reports used in this review are listed in appendix B.

3.0 RESULTS

3.1 Readiness Assurance

Readiness assurance assessment programs are designed by the sites to ensure that planning and resources are adequate and sufficiently maintained, exercised, and evaluated, and that appropriate, timely improvements are made in response to identified needs. M&O contractors and FEs at many sites rely on compliance-based assessments, which do not measure the effectiveness of a response capability. Programmatic assessments, coupled with performance-based assessments, are demonstrated to be more effective in determining whether the ERO has the capabilities to successfully perform its mission.

In preparing for the six emergency management exercises, readiness assurance determinations conducted by the M&O contractors were derived from contractor assurance systems (CAS) and approved in emergency readiness assurance plans (ERAPs) by the respective FE. None of the assessed sites self-identified any areas of noncompliance with site emergency management response and readiness assurance before conducting the exercise. However, EA's independent evaluations identified findings and deficiencies during the exercises that were not recognized or documented by the M&O contractor exercise evaluators. These opposing results may be attributed to using compliance-based assessment processes rather than assessing the effectiveness and proficiency of responders in executing their assigned tasks. Reliance on compliance-based assessments may contribute to site-specific readiness determinations that may inaccurately inform DOE management of actual readiness levels.

The following common performance weaknesses were identified:

- Most M&O contractors had not ensured that the training, drill, and exercise programs collectively established and maintained adequate site-specific emergency response and responder proficiency.
- Most M&O contractors did not provide decision makers with essential information to achieve acceptable situational awareness and a common operating picture, which resulted in many other performance weaknesses because the ERO, whose members are separated at various response venues, did not consistently have the necessary understanding of the incident to provide an effective response.
- Several M&O contractors and FEs had not effectively applied emergency management requirements to the extent necessary to ensure that all contractors and subcontractors were compliant with the requirements, including an effective concept of operations for emergency response actions.

Furthermore, assessments have identified a corresponding need for improved oversight of emergency management programs. Emergency management oversight by FEs leverages the CAS, which is largely dependent on data from the results of compliance-based assessments. In contrast, performance-based oversight assessments conducted by EA drew different conclusions on readiness assurance confidence levels based on the identification of significant issues from those reported by site CAS-based ERAPs. Although DOE executes some elements of a Departmental readiness assurance program, it has not implemented, managed, and coordinated an effective formal and structured readiness assurance program consisting of evaluation and improvement programs and documentation of the readiness of the emergency management program designed to ensure that the DOE emergency management program is executed in accordance with directives, regulations, policies, and applicable laws.

Significantly, some site readiness assurance determinations were found to be overstated as they did not fully evaluate effectiveness of incident response. The use of compliance-based approaches by most M&O contractors and FEs to validate the effectiveness of emergency management programs has resulted in high readiness assurance confidence levels. This contrasts with effectiveness-based assessments, which have identified repeated emergency management-related issues.

3.2 Situational Awareness and Common Operating Picture

The six assessments demonstrate that evaluated DOE sites lack adequate situational awareness and a common operating picture during an incident response, which are key to implementing an emergency operations system (EOS). The intent of the EOS is to ensure effective communications among response venues, field response teams, and offsite command centers by providing a common operating picture of the emergency response and shared situational awareness among all teams. This is accomplished by facilitating access to unclassified emergency response information, such as notification forms, emergency status updates, plume projections, significant activities data, and field monitoring data.

Despite having documented a compliant EOS, many sites did not demonstrate an effective EOS during their emergency management exercises. Assessed sites did not achieve effective communications among response organizations during a simulated emergency, and inadequate communications and information management degraded situational awareness and prevented a common operating picture among the sites, DOE Headquarters, and offsite organizations. Most sites had core EOS capabilities to collect incident information and to provide needed expertise for incident analysis from a centralized, well-equipped emergency operations center (EOC), and required the EOS be consistent with the operational concepts of the National Incident Management System. Nevertheless, many sites lacked an adequate process to obtain and maintain situational awareness and disseminate a common operating picture among response components and external partners, which often negatively impacted protective action decision making and implementation. Most M&O contractors had not provided adequate direction on establishing an integrated concept of operations with facility-level operations that expands with the activation of the ERO, as needed,

to include specific response capabilities (e.g., facility-level, site-level, and offsite). In addition, most evaluated high-hazard sites did not demonstrate effective capability for centralized collection, validation, analysis, and coordination of information, a key contributor to performance weaknesses in other response elements.

Few evaluated sites have an adequate integrated concept of operations, relative to the EOS with facility-level operations, that expands with the activation of the ERO, as needed, to include all ERO teams (e.g., facility-level, site-level, and offsite). Specifically, the site emergency plan, emergency plan implementing procedures, checklists, and other command media have not provided adequate planning and instructions to:

- Ensure that response information from first responders and ERO teams are collected and disseminated to achieve and maintain situational awareness among all responders' locations.
- Establish an information flow structure that assigns specific responsibility for each key information set, including responsibility for verifying and validating essential incident information collected.
- Require feedback loops for completing key response tasks and validating response information.

Furthermore, most site emergency plans require the ERO to develop and maintain situational awareness by providing a common operating picture among incident response components and external partners using an automated information system, such as Web-based Emergency Operations Center Software (WebEOC[®]), Emergency Management Information System (EMInS), or Common Operating Picture System (COPS). Nevertheless, this objective was often not met because many sites had not provided access to the automated information system and other automated information management products outside the EOC, which diminished situational awareness for field responders at the facility command posts, incident command posts, and security operations centers. Collectively, the ERO did not acquire and consistently share an adequate understanding of the incident to provide the desired level of response.

3.3 Emergency Response Capabilities

Response capabilities are an identified resource necessary to effectively respond to a DOE incident, as analyzed during site-specific emergency planning; the resource is required to meet site needs as established by DOE orders, the baseline needs assessment, safety basis requirements, and applicable regulations, codes, and standards. These capabilities and resources must be readily available so that the emergency management plan can be implemented for initial and ongoing emergency response and must include:

- A site-level ERO structure.
- A facility-level response capability, as necessary.
- Emergency facilities and systems capabilities to support effective response to the emergency planning hazards assessment (EPHA) hazards.
- Resources from local, state, and Federal organizations that are responsible for emergency response, or that may be used to supplement response capabilities based on emergency planning or formal agreements. Accordingly, preparation for such incidents required the sites to establish written agreements with offsite entities to enable effective integration into the site's emergency response.

EA independent reviews included targeted reviews of emergency preparedness for five sites to evaluate the processes for identifying emergency response capabilities and maintaining them in a state of readiness to protect the health and safety of workers and the public for any analyzed incident, whether natural or man-made, that requires responsive action beyond normal operations. The reviews used M&O self-assessment records from the site CAS, ERAP, and exercise program to verify that emergency response capabilities had been validated. Also, some response capabilities deemed necessary for both low-

probability and severe incidents that would be a financial burden to maintain on site or could be rendered unavailable if such an incident occurred were assessed.

All sites had a site-level composite ERO structure consisting of an integrated line and staff organization that responds to all emergency incidents within the site boundary commensurate with the associated hazards and threats identified in the all-hazards planning basis. In addition, some sites had facility-level EROs that provide initial emergency response to facility-specific incidents, with support from site-level response capabilities as needed.

Most FEs and M&O contractors adequately identified the necessary onsite capabilities and offsite interfaces required to respond to incidents consistent with the technical planning basis. In addition, most M&O contractors tested and validated the site-level EROs annually as required and site-level specialized teams over a rolling five-year period. The M&O contractors also routinely tested and validated the primary response facilities required to support the site-level EROs and adequately defined alternate facilities as required. In addition, FEs and M&O contractors adequately developed written agreements with offsite stakeholders that confirmed the necessary emergency response interface derived from the technical planning basis.

Nevertheless, FEs had not ensured the testing and validation of capabilities that have a low probability to be used, typically involving incidents with offsite consequences. Approximately 30%, and up to 55% in some cases, of the offsite response interfaces had not been validated or requested to be validated over a five-year period. For some sites, the offsite organization eliminated or repurposed the needed capability without notifying the FE or M&O contractor of the change. Some FEs have not given an appropriate priority to testing and validation of the offsite response interface capabilities. Consequently, responders may not be aware of the changes in personnel, capabilities, and internal procedures of offsite response organizations. In addition, none of the five sites validated all of their alternate facilities capabilities.

Importantly, some M&O contractors discontinued key emergency response capabilities without a formal decision analysis or agreement of the FE. One M&O contractor eliminated several capabilities supporting treatment of contaminated-injured workers. These included transport via air ambulance due to the distance (and time) to the nearest hospital; support from hospitals to accept a radiologically contaminated-injured worker; training provided by Radiation Emergency Assistance Center/Training Site for the site or hospital medical staff; and validating the onsite medical's capability to decontaminate and treat these patients. In addition, some M&O contractors inappropriately eliminated the designation of facility-level EROs. This practice could result in facility-level personnel not being adequately prepared to implement the emergency plan because facility-level responders would no longer be considered ERO members, and thus would not participate in an annual exercise to validate the facility-level response capability. This has occurred where the key facility-level decision maker still has responsibilities for:

- Assessing the situation and initially managing the incident scene, including implementation of immediate protective actions with the assistance of facility emergency response teams.
- Making notifications and requesting response resources.
- Activating applicable specialty teams.
- Transferring command and control to the arriving incident commander and transitioning to a subject matter expert within the unified command structure.

Of significance, none of the five assessed sites had self-identified any areas of noncompliance with site emergency response capabilities, as documented in readiness assurance determinations derived from CASs that were consolidated and approved in ERAPs.

3.4 Issues Management Process

Weaknesses in the issues management process have been identified at some sites despite having documented a compliant process. Sites with effective issues management processes include a rigorous causal analysis, timely corrective action implementation, frequent evaluated drills and exercises designed to test verified corrective actions, critical evaluation processes, and application of additional corrective actions and effectiveness reviews when validations show that more actions are needed. Programs implementing these processes generally have strong and integrated Federal oversight. Although sites report compliant processes, independent assessments have identified weaknesses in implementing an effective issues management process. A follow-up assessment reviewing the resolution of 59 EA emergency management findings, previously identified at eight NNSA and EM sites, revealed that the closure of corrective actions was not timely or effectively performed for 30 of the findings, with some findings dating back to 2012. The unresolved findings were related to two program elements, readiness assurance (issues management) and communications (situational awareness and notifications), and were identified as recurring issues in multiple assessments in FYs 2022 through 2024.

At several sites, assessments observed the recurrence of emergency management-related issues, indicating weaknesses in issues management processes because corrective actions to address the issues did not effectively prevent recurrence. Often, when addressing the identified issue, sites addressed the consequences of the issue, focusing on the details that led to the finding, but did not address the underlying cause. Additionally, the recurrence of issues indicates the lack of effective verification and validation processes. Absent in many cases is the use of evaluated drills and functional exercises to test corrective actions when most findings were identified by these activities.

A significant factor in the cause of ineffective corrective actions is weaknesses in the implementation of DOE Order 226.1B, attachment 1, across the DOE complex. DOE Order 226.1B requires findings to be categorized based on risk and priority; however, many sites do not categorize health and safety issues identified during annual exercises as high risk or priority findings because they occurred during a simulated hazardous material release rather than a real incident. This results in emergency management findings often being categorized as low risk and low priority per site issues management procedures, which leads to the application of less robust causal analysis and verification and validation processes. Finally, assessments have shown that sites are often not self-critical when performing corrective action verification and validation, even when sites test corrective actions in an exercise.

4.0 BEST PRACTICES

A best practice is a safety-related practice, technique, process, or program attribute observed during an appraisal that may merit consideration by other DOE and M&O contractor organizations for implementation because it has been demonstrated to substantially improve safety or security performance of a DOE operation, or it represents or contributes to superior performance (beyond compliance). Additionally, a best practice could be identified because it solves a problem or reduces the risk of a condition or practice that affects multiple DOE sites or programs, or it provides an innovative approach or method to improve effectiveness or efficiency. The following best practices were identified during the assessments:

- At the Savannah River Site, Savannah River Nuclear Solutions, LLC implemented a comprehensive, multifaceted approach to ensure that corrective actions are adequately closed. This approach includes: comprehensive revision of self-assessment and corrective action program procedures; revision of review board charters; creation of a new readiness assurance manager position; increased emergency management staffing to support readiness assurance; increased involvement of its facility review board; development of a CRAD for use in self-assessments; training of emergency

management personnel on readiness assurance activities; and implementation of a policy for timely issuance of lessons learned.

- At the Pantex Plant, Consolidated Nuclear Security, LLC (CNS) demonstrated a mature and highly effective readiness assurance process, providing strong evidence of effective closure of findings undergoing an independent review. M&O contractor records showed that issues were properly analyzed and addressed, and that plans, procedures, processes, and training are adequate to prevent recurrence. Most notably, as a best practice, the M&O contractor's verification and validation processes are robust and key to preventing issue recurrence. Multiple times during the validation process, the M&O contractor identified additional corrective actions needed for effective closure of findings. These additional corrective actions would not have been discovered without robust verification and validation reviews. For evaluated drills and exercises, the M&O contractor includes objectives specifically designed to validate corrective actions. The M&O contractor also periodically uses a series of evaluated drills to ensure that closure actions are adequate to prevent recurrence.
- At the Pantex Plant, CNS implemented several best practices in the process of closing a finding pertaining to emergency communications, including: defining information flow processes within facilities and field response teams for the purpose of enhancing overall communications; developing a project plan for implementation of the information management system; developing ERO checklists and procedures to enhance information sharing; and adding checklist tasks to specifically prompt sharing of critical information with both offsite entities and the onsite ERO. In addition, several significant strengths related to emergency communications, including implementing a geographic information system (GIS) tool for use in the EOC; adding a mapper position for the incident command team; developing a project plan for implementation of the information management system; and developing and implementing the logistics team's resource request processes.
- At the Oak Ridge National Laboratory, a United Cleanup Oak Ridge, LLC procurement procedure requires approval by the emergency management lead for any chemical acquisitions, which ensures that emergency management evaluates any new chemicals or additional chemical quantities being procured for inclusion in the facility all-hazards analysis and also determines whether the chemical needs to be analyzed in the EPHA prior to being purchased or brought on site. This is a proactive process for ensuring that compliance with the requirements in DOE Order 151.1D is maintained.
- At Los Alamos National Laboratory (LANL), Triad National Security, LLC (Triad) created an innovative animation video to initiate the simulated incident and shared the video with workers who were at the simulated incident scene.
- At LANL, Triad performs live streaming of press conferences at the joint information center, also viewable in the EOC.
- At LANL, Triad has incorporated incident scene cameras to enable the exercise control cell to view the on-scene response during exercises.
- Although DOE Order 151.1D does not specify the frequency for programmatic assessments, all surveyed FEs conduct annual assessments of M&O contractor emergency management programs. Moreover, the Portsmouth/Paducah Project Office and Richland Operations Office conduct annual assessments of M&O contractor emergency management programs using a formal CRAD.
- The NNSA Production Office directed the augmentation of the Y-12 National Security Complex ERO with M&O contractor personnel from the Pantex Plant to mitigate challenges associated with Coronavirus Disease 2019 and encourage institutional learning. Efforts to supplement CNS Y-12 personnel with personnel from the Pantex Plant strengthened the EOS. The staff augmentation provided cross-training opportunities and the export of foundational practices.

5.0 RECOMMENDATIONS

These recommendations are based on the analysis of EA assessments as summarized in section 3 of this report. Although the underlying deficiencies and weaknesses from individual reviews did not apply to every reviewed site, the recommended actions are intended to provide insights for potential improvements at all DOE sites. Consequently, DOE organizations and M&O contractors should evaluate the applicability of the following recommended actions to their respective facilities and/or organizations and consider their use as appropriate in accordance with Headquarters and/or site program objectives.

Readiness Assurance

Recommendation RA-1: FE managers and M&O contractors should develop and implement a performance-based exercise assessment process that includes a structured tool for comprehensively evaluating the effectiveness of emergency response capabilities based on site-specific hazards and plans by:

- Developing an assessment process that centers on the use of operations-based exercises to test and validate policies, plans, procedures, training, equipment, and interagency agreements.
- Developing realistic and challenging operations-based exercises that simulate execution of an integrated emergency response.
- Requesting an EA independent oversight assessment team to periodically validate the site's performance-based assessment process.

Situational Awareness and Common Operating Picture

Recommendation SA-1: FE managers and M&O contractors should improve situational awareness and common operating picture weaknesses by strengthening site-specific emergency plans, emergency plan implementing procedures, checklists, and other command media to add and implement requirements for:

- Implementing a structure for information flow that assigns specific responsibility for each key information set, including responsibility for verifying and validating essential incident information collected in an automated information system (i.e., WebEOC[®], EMInS, and COPS) or other response records.
- Incorporating guidance on the use of information management tools and resources to flow down requirements into the emergency plan, implementing procedures, and response checklists.
- Integrating incident management tools with other web-based GIS to provide ERO personnel with mapping displays, data, and analysis tools for the site, the surrounding area, and interiors of many onsite buildings.

Recommendation SA-2: FE managers and M&O contractors should address concept-of-operations weaknesses by strengthening site-specific emergency plans, emergency plan implementing procedures, checklists, and other command media to add and implement requirements for:

- Use a web-based GIS to provide information and tools to enable better decision making in emergency management through a common operating picture and analysis tools providing recommendations for initial protective actions.
- Improve the emergency response concept of operations between DOE sites and offsite emergency response contracted service providers by:
 - Revising site emergency plans to clearly describe and document the concept of operations implemented by the site and offsite agencies using the requirements of DOE Order 151.1D applicable to each organization.

- Establishing formal methods of communication and protocols to facilitate the flow of decision-making information among offsite organization EOCs and requiring DOE site participation in decision making following the implementation of initial preplanned protective measures and activities.
- Developing a coordinated plan or protocol that implements an integrated response among offsite response interfaces to a hazardous material incident at a DOE site that results in a General Emergency declaration.

Emergency Response Capabilities

Recommendation ER-1: FE managers and M&O contractors should ensure that emergency response and offsite emergency response interface capabilities are maintained and validated over a rolling five-year period by:

- Maintaining a rolling five-year matrix of emergency response capability validations.
- Approving any proposed elimination of emergency response capabilities to ensure that key capabilities required for the protection of workers and the public are maintained.
- Approving any proposed elimination of facility-level EROs for high-hazard facilities to ensure the facility-level decision maker and teams can effectively protect the health and safety of workers during the delay in site-level first responders' arrival at remote facilities.

Issues Management Process

Recommendation IM-1: FE managers and M&O contractors should address issues management weaknesses by improving the implementation of causal analyses, effectiveness reviews, and closure processes with more robust procedures that:

- Identify criteria or a threshold for findings requiring a rigorous causal analysis, which should include findings identified during simulated hazardous material releases.
- Clarify the level of Federal oversight and M&O contractor management involvement for approving causal analyses, corrective action plans, methods for conducting effectiveness reviews, and finding closure processes.
- Increase the use of evaluated drills and exercises to validate the effectiveness of corrective actions and minimize the time between verification and validation activities.

Appendix A Supplemental Information

Office of Enterprise Assessments (EA) Management

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Appendix B

Assessment Reports

- EA Report, *Independent Assessment of Emergency Preparedness Capabilities at the Los Alamos National Laboratory*, December 2021 [Capability Assessment]
- EA Report, *Summary Report: Independent Focused Assessment of Emergency Management Corrective Actions at National Nuclear Security Administration and Office of Environmental Management Sites*, March 2022 [Focused Assessment]
- EA Report, *Independent Assessment of the U-233 Processing All-Hazards Planning Basis at the Oak Ridge National Laboratory*, March 2022 [Technical Basis Assessment]
- EA Report, *Independent Assessment of Emergency Management at the Y-12 National Security Complex*, April 2022 [Exercise Evaluation Assessment]
- EA Report, *Independent Assessment of Emergency Management at the Idaho National Laboratory*, April 2022 [Exercise Evaluation Assessment]
- EA Report, *Independent Assessment of Emergency Preparedness Capabilities at the Savannah River Site*, May 2022 [Capability Assessment]
- EA Report, *Independent Assessment of Emergency Preparedness Capabilities at the Nevada National Security Site*, August 2022 [Capability Assessment]
- EA Report, *Independent Assessment of Emergency Management at the Lawrence Livermore National Laboratory*, December 2022 [Exercise Evaluation Assessment]
- EA Report, *Independent Assessment of the Transuranic Waste All-Hazards Planning Basis at the Savannah River Site*, March 2023 [Technical Basis Assessment]
- EA Report, *Independent Assessment of Headquarters Line Management Oversight of Emergency Management Programs*, April 2023 [Focused Assessment]
- EA Report, *Independent Assessment of the Transuranic Waste All-Hazards Planning Basis at the Los Alamos National Laboratory*, May 2023 [Technical Basis Assessment]
- EA Report, *Independent Assessment of Emergency Management at the Argonne National Laboratory*, June 2023 [Programmatic Assessment]
- EA Report, *Independent Assessment of Emergency Preparedness Capabilities at the Waste Isolation Pilot Plant*, October 2023 [Capabilities Assessment]
- EA Report, *Independent Assessment of the Emergency Management Program at the Pacific Northwest National Laboratory*, December 2023 [Programmatic Assessment]
- EA Report, *Independent Assessment of the Transuranic Waste All-Hazards Planning Basis at the Hanford Site*, December 2023 [Technical Basis Assessment]
- EA Report, *Independent Assessment of the 2023 Full-Scale Emergency Management Exercise at the Waste Isolation Pilot Plant*, February 2024 [Exercise Evaluation Assessment]
- EA Report, *Independent Assessment of the Transuranic Waste All-Hazards Planning Basis at the Oak Ridge National Laboratory*, February 2024 [Technical Basis Assessment]
- EA Report, *Independent Assessment of the Emergency Management Program at the National Energy Technology Laboratory*, April 2024 [Programmatic Assessment]

- EA Report, *Independent Assessment of the Emergency Management Program at the Sandia National Laboratory*, August 2024 [Programmatic Assessment]
- EA Report, *Independent Assessment of the 2024 Full-Scale Emergency Management Exercise at the Los Alamos National Laboratory*, September 2024 [Exercise Evaluation Assessment]
- EA Report, *Independent Assessment of the 2024 Emergency Management Annual Field Exercise at the Hanford Site*, September 2024 [Exercise Evaluation Assessment]