



Operating Experience Summary

OES 2026-03

April 2026

DOE Emergency Management Lessons and Tools for Readiness

Purpose

The Department of Energy (DOE), including the National Nuclear Security Administration (NNSA), manages many complex operations across the country. Each comes with unique and diverse risks that can adversely impact our people, the environment, and our mission. DOE's ability to proactively identify, understand, and mitigate potential threats is critical for operational readiness and resilience.

The purpose of this Operating Experience Summary (OES) is to share best practices and improve visibility of observations on emergency management program performance to strengthen individual site programs. It presents enterprise-level insights from both the Office of Emergency Management (NA-40) whose mission includes assisting labs, plants, and sites in implementing their emergency management programs and the Office of Emergency Management Assessments (EA-33) who performs independent assessments for DOE senior leadership. The OES shares tools and information that enable field sites to make tangible updates and bolster the Department's readiness in effectively responding to evolving operational risks.

Information Sources

In September 2025, NA-40 published the *Annual Report on the Status of the Department's Emergency Management System*. This valuable report connects key performance metrics from sites across DOE to provide DOE leadership with visibility into enterprise-level emergency readiness. It analyzes high-level data submitted by DOE laboratories, plants, and sites in their annual Emergency Readiness Assurance Plans (ERAP) from FY23 and FY24. The ERAP is a documented annual report on the development, implementation, and maintenance of an emergency management program. The ERAP is also a planning tool to identify and develop needed resources and improvements.

The Office of Enterprise Assessments (EA) implements DOE Order (O) 227.1A, *Independent Oversight Program*, and used Order 151.1D, *Comprehensive Emergency Management System*, to evaluate the effectiveness of emergency management programs at DOE hazardous material facilities. EA released two reports on emergency management program assessments in 2022 and 2024: *Summary Report*:

[DOE Order 151.1E](#), *Comprehensive Emergency Management System*, October 28, 2024.

Each DOE/NNSA lab, plant and site is required to develop and participate in the Comprehensive Emergency Management System to ensure:

- ❖ The Department can effectively and efficiently respond to all Operational and Energy Emergencies and ensure appropriate response measures are taken to protect workers, the public, the environment, and national security.
- ❖ Emergencies are recognized, categorized and, as necessary, classified promptly; and parameters associated with the emergency are monitored to detect changed and degraded conditions.
- ❖ Emergencies are reported to all relevant parties, and notifications are made in a timely manner.
- ❖ Reentry activities are properly and safely accomplished in accordance with approved guidance, and recovery and post-emergency activities commence in a timely and efficient manner.

The NNSA Office of Emergency Management is the Office of Primary Responsibility for DOE O 151.1E.

Independent Focused Assessment of Emergency Management Corrective Actions at National Nuclear Security Administration and Office of Environmental Management Sites (March 2022), and Lessons Learned from Assessments of Emergency Management Programs Fiscal Years 2022-2024 (December 2024). EA conducted these independent assessments of 21 emergency management programs at multiple DOE sites. The assessed emergency management program areas are further described in the Appendix located at the end of this OES.

Discussion – Reported Operating Experience

Annual Report on the Status of Department’s Emergency Management System:

Compiled ERAP data from field sites in the *Annual Report* shows that the DOE emergency management enterprise maintained strong foundational readiness in FY24. Reports show consistent performance in critical areas, including 65% of sites exercising against at least one of their self-identified top threats for the two fiscal years (FY23 and FY24). Furthermore, the enterprise effectively managed an increased volume of real-world incidents without an increase in their severity.

At the same time, persistent Emergency Response Organization (ERO) qualification shortages and a significant drop in corrective action closure rates—particularly for issues arising from real-world incidents—all point to a need for renewed focus on fundamental aspects of program administration, personnel development, and disciplined issue resolution to sustain and enhance DOE’s operational effectiveness. The NA-40 *Annual Report* notes an issues management decline in FY24 with the closure rate dropping to 19% from 74% in FY23.

Summary Highlights from EA-33

DOE-Wide Opportunities

- Increase reliability of performance-based exercise assessment processes.
- Enhance common operating pictures with media and improve communications.
- Validate readiness of site-specific emergency response capabilities over a rolling five-year period.

Site-Specific Strengths

- Robust verification and validation processes. (Pantex)
- Chemical hazards analysis conducted at time of acquisition, before ordering and arrival on-site. (ORNL)
- Tailored annual assessments above Order 151.1E requirements. (PPPO)

EA Assessments:

DOE-Wide Opportunities

Independent assessments conducted by EA-33 identified that multiple sites did not execute several elements of a Departmental readiness assurance program. Specifically, multiple EA-33 assessments documented that many DOE sites lack adequate situational awareness and do not maintain an effective common operating picture (COP) during incident response which is key to implementing an emergency operations system (EOS). Assessed sites oftentimes did not achieve effective communications among response organizations during a simulated emergency, inadequate communications and information management sometimes degraded situational awareness, and sites frequently did not self-identify areas of noncompliance with site emergency response capabilities. Similar observations, during the same

Exercise Improvement Checklist

- ✓ Ensure exercise programs cover the full spectrum of potential events and response capabilities.
- ✓ Ensure exercise notifications contain accurate and complete information.
- ✓ Test communication equipment interoperability and identify opportunities to improve situational awareness and a common operating picture among ERO groups.
- ✓ Confirm previous exercise findings are adequately addressed and closed!

reporting period, were documented in independent audit organization reporting related to specific weaknesses in COP, communications, validation of procedures, and notifications at various high-hazard nuclear sites throughout the DOE complex.

Observations contained in the EA reports from 2022 and 2024 found weaknesses in readiness assurance, communications (situational awareness and notifications), performance-based evaluations to measure the effectiveness of personnel and capabilities for incident response, and issues management including ineffective closure of corrective actions. The weaknesses and best practices contained in the two EA reports are summarized below.

The first EA report, published in March 2022, focused on follow-up assessments of 59 findings and corrective actions issued over the previous nine years at eight sites. The follow-up assessments determined that only 29 findings had been adequately resolved, and four issues related to two of the program elements - Readiness Assurance, and Notifications and Communication - continue to be problematic at multiple DOE sites. EA noted weaknesses in verification and validation processes for testing corrective action effectiveness at several DOE sites. Specifically, some sites did not perform effectiveness reviews, some sites chose to verify and validate corrective actions through procedure reviews instead of using an evaluated drill or exercise, one site did not implement the requirements for causal analysis, and DOE oversight of readiness assurance processes was lacking at several sites.

The second report, published in 2024 focused on 21 independent assessments of emergency management programs across sites under the responsibility of the Offices of Environmental Management, Science, Nuclear Energy, and Fossil Energy and Carbon Management (renamed Hydrocarbon and Geothermal Energy Office). 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. EA identified weaknesses in readiness assurance, situational awareness and common operating picture, emergency response capabilities, and issues management as identified below.

- Most sites limit their self-assessments in implementation of the *Comprehensive Emergency Management System* Order to compliance with requirements rather than conducting performance-based evaluations that measure the effectiveness of personnel and capabilities in responding to an incident. Consequently, reported site-specific readiness determinations 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 issues.
- Site M&O contractor exercise evaluators typically did not identify all relevant issues.

Site-Specific Best Practices

The reports also highlighted good practices which may be useful for other sites' improvement processes. Best practices are safety-related practices, techniques, processes, or program attributes observed during an assessment that may merit consideration by other DOE and contractor organizations for implementation.

Readiness Assurance:

- At Pantex, Consolidated Nuclear Security, LLC (CNS) demonstrated robust verification and validation processes, which are key to preventing issue recurrence, such as exercise objectives specifically designed to validate corrective actions. (EA-33 Independent Assessment of Emergency Management at Pantex)
- At Savannah River Site, Savannah River Nuclear Solutions, LLC implemented a comprehensive, multi-faceted approach to ensure corrective actions are adequately closed. (EA-33 Focused Independent Assessment of Emergency Management Corrective Actions)
- 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.
 - Incorporated incident scene cameras to enable the exercise control cell to view the on-scene response during exercises. (EA-33 Independent Assessment of Emergency Management at LANL)
- Portsmouth/Paducah Project Office (PPPO) and Richland Operations Office conduct annual assessments of M&O contractor emergency management programs using a formal CRAD although it is not required by DOE Order 151.1E. (EA-33 Independent Assessment of Headquarters Line Management)

Notifications and Communications:

- At Pantex, CNS also 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 elements for the purpose of enhancing overall communications; developing a project plan for implementation of the information management system; developing emergency response organization (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. (EA-33 Independent Assessment of Emergency Management at Pantex)
- At LANL, Triad live-streams press conferences at the joint information center which are also viewable in the EOC. (EA-33 Independent Assessment of Emergency Management at LANL)

All Hazards Planning Basis:

- 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 any new chemicals or additional quantities being procured are evaluated for inclusion in the facility all-hazards analysis and emergency planning hazards assessment (when necessary) prior to being purchased or brought on site. (EA-33 Independent Assessment of TRU Waste at OREM)

Emergency Response Organization:

- 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. (EA-33 Independent Assessment of Emergency Management at the Y-12 National Security Complex)

Recommendations and Resources

Takeaways for Performance Improvement

- **Readiness Assurance:** Performance-based exercise assessment processes should include structured tools for comprehensively evaluating the effectiveness of emergency response capabilities based on site-specific hazards.
- **Situation Awareness and Common Operating Procedures (*Communication*):** Address potential weaknesses related to concept-of-operations and a common operating picture by ensuring site-specific emergency plans, emergency plan implementing procedures, checklists, and other command media include requirements for ensuring and maintaining situational awareness across response venues.
**Flow-down of requirements/responsibilities to all levels including field.*
- **Emergency Response Capabilities:** 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:** Identify and correct any barriers in local issues management processes that hamper the effective resolution of identified weaknesses. Effective issues management processes for preventing recurrence include robust causal analyses, effectiveness reviews, and structured corrective action closure processes.



2024-2025 Lessons Learned

[Ensure Immediate Emergency Response Protocols Are Clearly Understood and Accessible During On-Site Events](#)

Idaho National Laboratory (INL)

[Enhancing Reliability of Fire Detection Systems in Nuclear Facilities: Best Practices for Maintenance and Replacement](#)

Argonne National Laboratory (ANL)

[Flagging to Connect: The First Link During Emergency Response](#)

Central Plateau Cleanup Company – CPCCo (Hanford)

[We All Know Duck and Cover, but What About an Area Wide Take Cover?](#)

Central Plateau Cleanup Company – CPCCo (Hanford)

[Lessons Learned Flash: Call LSS for All Emergencies](#)

Oak Ridge National Laboratory (ORNL)

More tools you can use...

Connect with the EMI-SIG!

NA-40 sponsors the **Emergency Management Issues – Special Interest Group (EMI-SIG)** for emergency managers across the DOE/NNSA to discuss common issues and share best practices and lessons learned. Each focus area is addressed in Subcommittees who meet monthly and provide summary reports on achievements and discoveries at the annual Emergency Management Symposium.

There are currently nine groups:

- **Continuity Programs Subcommittee (CPSC)**
- **DOE Meteorological Subcommittee (DMSC)**
- **Emergency Public Information Subcommittee (EPISC)**
- **Emergency Readiness Assurance Subcommittee (ERASC)**
- **First Responders Subcommittee (FRSC)**
- **Subcommittee for Emergency Management Planners (SEMPER)**
- **Subcommittee on Emergency Management Technology (SEMTECH)**
- **Subcommittee on Technical Analysis and Response Support (STARS)**
- **Training and Exercise Subcommittee (TESC)**

To learn more or join the EMI-SIG, contact: liaisons@nnsa.doe.gov
See: [EMI-SIG PowerPedia Page](#) or [Emergency Management Hub](#)

Technical Support Request (TSR)

NA-40 also provides support to laboratories, plants, and sites to increase their planning, preparedness, and readiness of the emergency management programs for real world incidents through [TSRs](#). The following are the types of requests that are supported by the TSR Program:

- **Assessments:** Provide support for the site or field offices to conduct emergency management assessments.
- **Document Review:** Provide independent reviewers to support site or field office with the review of emergency management documentation.
- **Exercise Evaluation:** Provide a subject matter expert (SME) to support site or field office with exercise evaluation.
- **Exercise HQ Participation:** HQ Watch Center participation to support the site's exercises.
- **EPI & Mock-Media:** Public information/media resources to provide emergency public information training and support site's exercises.
- **Training:** Provide training for Exercise Builder, Exercise Design Workshop, EPI Code/Hotspot, and NARAC.
- **Site Assist Visit:** Provide meteorological site assist visits to support and assess the site's capabilities.
- **EMI-SIG Product:** Training and products proposed by EMI SIG subcommittees that have completed a product proposal approved by the EMI-SIG Steering Committee
- **Other:** Requests not classified above, such as proposals for the development of products to support the Emergency Management community.

Emergency Management Advisory Committee (EMAC)

NA-40 is the Secretariat for the **Emergency Management Advisory Committee (EMAC)**. The EMAC provides a forum for DOE/NNSA Federal Headquarters, Field and Site Office emergency managers to align and prioritize program administration and implementation, and to resolve effectively and timely emergency management issues. The EMAC supports and informs all Emergency Management Enterprise federal line managers on recommendations and decisions regarding the implementation of policies, strategic plans, goals, and resources.

References

[Summary Report: Independent Focused Assessment of Emergency Management Corrective Actions at National Nuclear Security Administration and Office of Environmental Management Sites](#), U.S. Department of Energy Office of Enterprise Assessments, March 2022

[Lessons Learned from Assessments of Emergency Management Programs at DOE Sites During Fiscal Years 2022-2024](#), U.S. Department of Energy Office of Enterprise Assessments, December 2024

Annual Report on the Status of the Department's Emergency Management System, U.S. Department of Energy National Nuclear Security Administration Office of Emergency Management, September 2025

DOE O 151.1D, Chg 1, [Comprehensive Emergency Management System](#), October 4, 2019

DOE O 151.1E, [Comprehensive Emergency Management System](#), October 28, 2024

Additional Sources of Information

[Communications Interoperability Performance Measurement Guide](#), Department of Homeland Security

[Preparedness Toolkit](#), Federal Emergency Management Agency, Department of Homeland Security

Definitions per DOE O 151.1E:

Emergency: Any incident, whether natural, technological, or human-caused, that necessitates responsive action to protect life, property, critical infrastructure, or environment.

Operational Emergency: A major unplanned or abnormal incident or condition that involves or affects DOE facilities and activities by causing or having the potential to cause serious health, safety, or environmental impacts.

For information or questions about this OES, please contact Meagan Sanchez at Meagan.Sanchez@hq.doe.gov or the Office of ES&H Data Strategy and Performance by email at OEC@hq.doe.gov.

For information or questions about the EA reports and contributions, please contact the Office of Environment, Safety and Health Assessments at DOE-EA-30-Inquiry@hq.doe.gov.

Operating Experience Summary

Operating Experience Summary (OES): An informative operating experience-based article published by the Office of Environment, Health, Safety, and Security (EHSS) and distributed across the DOE complex through the DOE Corporate Operating Experience Program to promote safety and mission success through the open exchange of valuable experiences, good practices, and performance summaries.

Learn more at: [Operating Experience Summaries | Department of Energy](#)

Appendix to DOE Emergency Management Lessons and Tools for Readiness OES 2026-03

EA used the version of Order 151.1 that was current at the time of their assessments in 2022 and 2024 which had 15 program elements. The Order revision in 2024 combined the Emergency Operations System program element with the Emergency Response Organization (ERO), making the current 14 elements of an emergency management program:

- 1) Program Administration and Management
- 2) All-Hazards Planning Basis
- 3) Emergency Response Organization
- 4) Training
- 5) Emergency Medical Support
- 6) Off-site Response Agencies
- 7) Emergency Categorization and Classification
- 8) Protective Actions
- 9) Consequence Assessment
- 10) Emergency Facilities, Equipment, and Systems
- 11) Notifications and Communications
- 12) Emergency Public Information
- 13) Termination and Recovery
- 14) Readiness Assurance

The ERO program element includes the requirements of Presidential Policy Directive 8 and Homeland Security Presidential Directive 5 to implement the National Incident Management System in support of the National Response Framework. The ERO is a structured organization with overall responsibility for initial and ongoing emergency response to all incidents in the All-Hazards Planning Basis. The ERO establishes control at the incident scene in accordance with the Incident Command System, develops and disseminates a Common Operating Picture (COP) to responders, and must include the capability to scale activation based on the severity of the incident including integrating activities with federal, state, and local agencies that provide on-site emergency response using the principles of Unified Command.