Message from the Secretary

The activities of the Office of Enterprise Assessments (EA) exemplify the Department of Energy's (DOE) commitment to protect national security assets and the health and safety of DOE employees and the public. EA provides an internal management assessment function for the Department that examines operations relating to safeguards and security (physical, information, and cyber); environment, health, and safety (nuclear and industrial); and other critical functions of the DOE enterprise.

This report contains an overview of EA independent oversight activities, findings, and recommendations for Fiscal Year 2021, as required by House Report 114-91.

This report is being provided to the following Members of Congress:

- **The Honorable Rosa L. DeLauro**  
  Chair, House Committee on Appropriations

- **The Honorable Kay Granger**  
  Ranking Member, House Committee on Appropriations

- **The Honorable Marcy Kaptur**  
  Chair, Subcommittee on Energy and Water Development, and Related Agencies  
  House Committee on Appropriations

- **The Honorable Michael K. Simpson**  
  Ranking Member, Subcommittee on Energy and Water Development, and Related Agencies  
  House Committee on Appropriations

- **The Honorable Patrick Leahy**  
  Chairman, Senate Committee on Appropriations

- **The Honorable Richard Shelby**  
  Vice Chairman, Senate Committee on Appropriations

- **The Honorable Dianne Feinstein**  
  Chair, Subcommittee on Energy and Water Development  
  Senate Committee on Appropriations

- **The Honorable John Kennedy**  
  Ranking Member, Subcommittee on Energy and Water Development  
  Senate Committee on Appropriations

If you have any questions or need additional information, please contact me or Ms. Katie Donley, Deputy Director for External Coordination, Office of the Chief Financial Officer, at (202) 586-0176.

Sincerely,

Jennifer Granholm
Executive Summary

The Office of Enterprise Assessments (EA) is responsible for implementing an Independent Oversight Program for security and safety within the U.S. Department of Energy (DOE) in accordance with DOE Orders 227.1A, Independent Oversight Program, and 226.1B, Implementation of Department of Energy Oversight Policy. This function is an integral element of the Department’s responsibility as a self-regulating agency to provide assurance of its security and safety posture to leadership, workers, and the public. The purpose of this report is to provide an overview of independent oversight activities, findings, and recommendations for Fiscal Year (FY) 2021 to the Committee on Appropriations, as required by House Report 114-91.

EA issued 37 independent oversight reports for assessments conducted of 20 DOE (including National Nuclear Security Administration and Power Marketing Administration) locations in FY 2021. This included an assessment of DOE’s response to the COVID-19 pandemic directed by the previous Secretary of Energy to identify lessons learned and provide recommendations for increasing resilience to future crises that could impact the DOE enterprise. EA did not identify any immediate or major risks warranting shutdown of operations. Overall, DOE’s security and safety programs are consistently fulfilling the objective of protecting workers, the public, and national security, continuing to do so throughout the pandemic, although management attention and improvement are needed in some areas.

Independent oversight assessment reports are provided to DOE senior managers, applicable DOE program and line managers, contractor managers, and congressional oversight committees. Additionally, these reports are shared with other DOE stakeholder organizations such as the Offices of Environment, Health, Safety and Security; Inspector General; Chief Information Officer; and Intelligence and Counterintelligence to promote improvements in security and safety performance. Recommendations and areas for improvement identified in FY 2021 assessment reports pertain to:

- Improving security risk assessments, analyses, mitigation, and acceptance;
- Implementing and adhering to DOE security and safety requirements;
- Enhancing the quality and breadth of assessments, testing, metrics, and other contractor performance assurance functions;
- Improving corrective action and issues management processes;
- Enhancing crisis response plans, authorities, and capabilities in light of the COVID-19 pandemic; and
- Improving nuclear safety, cybersecurity, physical and information safeguards and security, and emergency management programs.

This DOE Independent Oversight Program report contains a summary of FY 2021 independent oversight activities, a listing of independent oversight assessment reports completed in FY 2021, and overall conclusions and recommendations.
OFFICE OF ENTERPRISE ASSESSMENTS
FISCAL YEAR 2021
INDEPENDENT OVERSIGHT ACTIVITIES OVERVIEW

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I. Legislative Language

This report fulfills the Committee on Appropriations requirement in House Report 114-91, which accompanied the Energy and Water Development Appropriations Bill, 2016. The requirement states:

_The Office of Independent Enterprise Assessments is directed to continue to provide an annual report of its oversight activities, findings, and recommendations for the previous fiscal year._

II. Independent Oversight Program

The Office of Enterprise Assessments (EA) is responsible for implementing an Independent Oversight Program for security and safety within the U.S. Department of Energy (DOE) in accordance with DOE Orders 227.1A, _Independent Oversight Program_, and 226.1B, _Implementation of Department of Energy Oversight Policy_. To carry out this responsibility, EA conducts independent oversight assessments to identify gaps and vulnerabilities in programs and performance related to safeguards and security, cybersecurity, worker and public health and safety, and emergency management. The assessments are intended to assist in preventing and mitigating events that could negatively impact workers, the public, the environment, or national security.

EA considers relative risks and past performance in determining the specific oversight activities it conducts. EA independent oversight assessments are designed to complement, not replace, DOE line management’s responsibility to monitor and oversee contractor security and safety programs and performance, manage contracts, and conduct self-assessments.

Safeguards and security and cybersecurity independent oversight assessments gauge the effectiveness of security-related policies and programs throughout the Department. These assessments are performed to provide assurance that nuclear weapons and weapons components, special nuclear material (SNM), classified matter, and classified and controlled unclassified information are being protected from theft, sabotage, diversion, loss, or unauthorized disclosure. Follow-up assessments are performed to evaluate progress and effectiveness in implementing corrective actions for previously identified issues.

Safeguards and security independent oversight assessments generally evaluate the functional areas described in EA protocols, which include:

- Program planning and management,
- Personnel security,
- Protective force,
- Physical protection systems,
• Material control and accountability, and
• Information security.

Cybersecurity independent oversight assessments evaluate foundational program elements such as:

• Risk management,
• Configuration management,
• Contingency planning,
• Continuous monitoring,
• Identity and access management,
• Vulnerability management, and
• Technical implementation (through external and internal penetration testing).

Environment, safety and health (ES&H) independent oversight assessments evaluate nuclear safety, nuclear engineering, selected facility and worker safety programs, integrated safety management, and emergency response capabilities. These assessments are performed to evaluate the adequacy of protection for the public, workers, and the environment, particularly at DOE sites with nuclear facilities or conducting nuclear or radiological activities, and provide feedback to leadership and line management on needed improvements.

ES&H independent oversight assessment activities focus primarily on:

• Evaluating the status of nuclear safety at DOE nuclear facilities, including the functionality of vital safety systems and other nuclear safety programs and functions;
• Reviewing the design and construction of new or significantly modified nuclear facilities and the associated safety basis analyses and documentation;
• Conducting targeted, multi-site reviews of selected focus areas that are of interest due to known performance deficiencies, high risks, or recent changes in requirements;
• Evaluating emergency management capabilities at DOE sites with nuclear activities and significant quantities of hazardous materials;
• Reviewing safety programs at sites or within organizations where performance may present significant risk (e.g., less than expected safety performance or serious or recurring incidents or violations of requirements); and
• Evaluating line management feedback and improvement processes.

The Independent Oversight Program assessment processes are described in protocols available on DOE's website¹. The protocols provide a disciplined and consistent approach to evaluating, monitoring, and reporting on the status of security and safety program implementation within DOE. These processes were developed and refined over time, and tested through repeated use

during many different types of assessments.

EA continually strives to improve its internal processes to enhance the products and value EA provides to DOE. EA managers routinely solicit feedback from assessment team members and DOE line management personnel, and use that information to improve EA's oversight program and appraisal processes.

III. Activities and Findings

EA conducted a broad range of assessments in FY 2021 at sites critical to DOE’s missions to evaluate the effectiveness of physical, information, and cybersecurity programs; nuclear safety programs; and emergency management programs. Many assessments were conducted remotely as onsite appraisal activities were curtailed due to the COVID-19 pandemic, and some assessments were conducted using a hybrid approach that coupled remotely conducted activities with a minimal onsite presence.

EA continued to conduct most of its standard cybersecurity assessment activities using its broad remote penetration testing capabilities. EA was also asked to conduct three cybersecurity assessments not previously planned in response to Departmental needs associated with significantly increased telework during the pandemic, which exposed more Departmental assets to the internet. On the other hand, the restrictions imposed by the pandemic limited EA’s ability to conduct some safeguards and security performance testing; some assessments of programs involving classified matter (physical assets and information); and some aspects of environment, safety and health assessments, such as observing work activities, nuclear safety system operations, and emergency management exercises. Despite these restrictions, EA continued to execute its mission effectively by developing new oversight approaches employing virtual technology capabilities to oversee operations.

A major focus of this year's activities was completion of a Pandemic Lessons Learned Review directed by the previous Secretary of Energy. To conduct the review, EA worked collaboratively with DOE and National Nuclear Security Administration program, staff, and field elements; the national laboratories and technology centers; site operating and production contractors and support service contractors; and the Power Marketing Administrations, to collect, compile, and analyze contributor experiences with DOE’s response to the pandemic. The review focused on actions taken to maintain effective command and control, continue essential work performance in a safe and secure manner, achieve maximum telework, and communicate effectively while implementing COVID-19-related government direction and guidance. The January 2021 report, Lessons Learned from the U.S. Department of Energy’s Response to the Early Stages of the COVID-19 Pandemic, identifies 26 specific lessons learned, 10 enterprise lessons learned, and 7 best practices intended to promote organizational learning. The report also provides 5 recommendations for potential improvements to increase resilience to future crises that could impact the DOE enterprise. EA conducted a separate review focused on the effectiveness of DOE Headquarters command, control, and communication and supporting emergency response
structures used during the pandemic response. The results of that review are published in a December 2020 report titled *Lessons Learned: Command, Control, and Communication During the COVID-19 Pandemic Response*.

EA nuclear safety assessments conducted in FY 2021 focused on evaluating high-hazard nuclear construction projects and operations, changes to nuclear facility safety basis documents, and programs to support increased plutonium pit production. Safeguards and security and cybersecurity assessments focused on DOE operations and systems that manage SNM, classified matter, and other sensitive assets entrusted to the Department.

The information contained herein is derived from independent oversight assessment reports issued in FY 2021. Reports for individual locations and activities identify best practices, findings, deficiencies, and areas for improvement. Crosscut reports, which provide an analysis of results from several locations, identify best practices and recommendations. Some referenced reports pertain to assessments conducted in the latter part of FY 2020. Some assessments conducted in the latter part of FY 2021 are not referenced herein as the assessment reports will not be issued until after FY 2022 has begun.

The table in section G identifies the locations of the assessments conducted in FY 2021 by assessment area. It does not include EA’s two COVID-19 pandemic-related assessments.

### A. Safeguards and Security Assessments

EA completed 10 safeguards and security assessments for 8 DOE locations in FY 2021, including two special access program assessments and a DOE Headquarters program special assessment. Five of the locations possess Category I quantities of SNM (Category I SNM).

Safeguards and security assessments evaluated the adequacy of site security programs in protecting Category I SNM; special access, national security and intelligence information; and other national security assets. EA also conducted a special assessment of the Department’s Insider Threat Program, which indicated that additional effort is necessary at the Headquarters level to clearly define the scope of the program and to structure its top-level requirements to align with DOE’s decentralized (field-based) operating framework.

Field site assessment results indicate sites are continuing to provide the requisite protection to DOE security interests using layered protection measures that include intrusion detection systems and delay barrier systems (e.g., perimeter fencing, vehicle barriers, and vaults). Roles, responsibilities, and authorities are generally well defined and understood between Federal and contractor security personnel and among contractor organizations with security-related

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2 Category I SNM means, in any combination, a quantity of: (1) 2 kg or more of plutonium, 5 kg or more of U-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope), or 2 kg or more of U-233 (DOE Order 474.2) or (2) 5 kg or more in any combination computed by the equation grams = (grams contained U-235) + 2.5 (grams U-233 + grams plutonium) (10 CFR Part 74). The latter is referred to as a formula quantity.
duties. Limited-notice performance testing demonstrated that well-trained and equipped protective forces provide timely response to postulated malevolent events such as an armed attack, the introduction of contraband into security areas, and the attempted theft of SNM. Performance testing also demonstrated sites are continuing to improve their internal testing processes and physical security systems for intrusion detection, security portal screening, and vehicle containment are functioning as intended.

Assessments are continuing to identify problems with the analytical bases for establishing site security programs that are resulting in incomplete programs and incomplete communication and management of risk. Most site security plans are not sufficiently comprehensive to cover all site security operations or are missing some required elements, and nuclear material control and accountability programs need improvement to reflect current operations and practices. Assessments also continue to identify weaknesses in contractor self-assessment and Federal survey processes and concerns with issues management programs, particularly regarding the quality and extent of causal analyses, timeliness of corrective action implementation, and issue recurrence prevention.

EA assessments of information security indicate DOE organizations are controlling and protecting classified information and have established effective access authorization programs to verify individual eligibility for access to particular types and categories of classified matter. Sites have generally implemented effective operations security programs to protect critical information and operations and enhance mission effectiveness. Several programs were found to be non-compliant with the requirements of DOE Order 470.6, Technical Security Program.

B. Cybersecurity Assessments

EA completed 11 cybersecurity assessments for 10 DOE locations and 1 crosscut assessment in FY 2021. Two of the assessments were of Departmental High Value Assets, which helped meet a DOE Agency Priority Goal associated with the Federal Information Security Management Act metrics for FY 2021 and eliminated the need for the Department of Homeland Security’s Cybersecurity and Infrastructure Security Agency to conduct these assessments.

Cybersecurity assessments evaluated the maturity and effectiveness of the risk management programs and technical security controls applied to protect classified and unclassified networks, applications, and information. EA operates a cybersecurity testing network to conduct remote penetration tests of networks to evaluate internal and external threats and identify potential pathways that could expose DOE networks to cyberattack. EA continued to expand its remote testing capabilities to ensure effective cybersecurity oversight was not diminished by the travel restrictions imposed by the pandemic and coupled remote and onsite activities to assess the Department’s national security systems.

3 DOE Order 470.6 implements DOE’s Technical Security Program, elements of which are derived from national-level, interagency programs codified in various laws, Executive Orders, national polices and directives.
Assessment results indicate sites are focusing efforts on incident detection and response capabilities, in large part due to the increased cybersecurity threats and many high-profile compromises and vulnerabilities identified in 2021. Cybersecurity programs for DOE classified networks and information are generally well-managed and provide adequate protection to the systems and information processed on the classified resources. Improvement is needed in configuration management, implementation of least functionality, and vulnerability management of these systems. Effective protection of unclassified systems and networks varied among the assessed sites, with improvement needed in configuration management, continuous monitoring, sensitive information protection, and vulnerability management.

C. Nuclear Safety and Environment Assessments

EA completed four nuclear safety assessments for four DOE locations in FY 2021. Nuclear safety assessments focused on evaluating critical nuclear safety protection systems and contractor assurance and issues management systems, as well as Federal oversight of these elements.

Assessment results indicate processes and procedures established to fulfill nuclear facility safety management functions (e.g., operations, maintenance, and engineering) are well-developed and effectively implemented, and safety systems at operating nuclear facilities continue to be well-maintained and managed such that the systems perform the intended safety functions. DOE contractors are adequately resolving most issues identified by assessments and are employing issues management tools (e.g., causal analyses, extent of condition reviews, corrective action plans) to improve performance. Issues management programs need improvement in properly categorizing issues, performing causal analyses where warranted, evaluating issues sufficiently to identify the breadth of causes and systemic implications, and identifying and promptly completing corrective actions to prevent recurrence. Most Federal oversight processes were found to be effective in monitoring and evaluating contractor performance and identifying weaknesses in contractor performance assurance and issues management programs.

D. Nuclear Engineering and Safety Basis Assessments

EA completed five nuclear engineering and safety basis assessments for two DOE locations in FY 2021. This is a new subset of EA environment, safety and health assessments that aligns with EA’s focus on the design, construction, and startup of new high-hazard nuclear facilities and facilities being modified to support DOE’s missions, such as plutonium pit production. Assessments evaluated the technical adequacy and completeness of nuclear facility safety basis analyses and documentation, and the controls and systems selected to protect workers and the public. Assessments also evaluated the adequacy of DOE line management reviews of these elements.

Assessment results indicate safety basis documents generally comply with applicable DOE
requirements and guidance and provide reasonable assurance that nuclear facilities can be operated in a manner that adequately protects workers, the public, and the environment. The safety basis documents reviewed properly integrate safety into the facility design, include an appropriately detailed and conservative hazard evaluation, provide a sound basis for the selection and classification of hazard controls, establish proper performance criteria, and identify an appropriate set of specific administrative controls. The assessments also indicate DOE line management reviews of these analyses and documents are identifying improvements where needed and are sufficiently rigorous to provide confidence of adequate worker and public protection upon DOE approval.

E. Worker Safety and Health Assessments

EA did not formally issue any worker safety and health assessment reports in FY 2021. Worker safety and health assessments are based primarily on onsite observations of work activities, which was precluded by the pandemic for much of FY 2021. In FY 2021, EA worker safety and health assessment resources were devoted to participating in EA’s COVID-19 lessons learned assessment, monitoring and analyzing COVID-19 reporting and recordkeeping practices, supporting DOE’s COVID-19 hotline, and participating in assessments being conducted by other EA offices, such as those pertaining to issues management programs. Onsite assessment activities resumed in the latter part of FY 2021 for which assessment reports are forthcoming.

F. Emergency Management Assessments

EA completed two site emergency preparedness capability assessments, one lessons learned assessment, and one special study of emergency management programs in FY 2021.

Emergency management assessments evaluated the readiness of site emergency response capabilities based on an in-depth review of DOE and contractor performance validation activities conducted during the preceding 5-year period and whether those activities adequately tested the breadth of the available capabilities. Assessment results indicate sites are maintaining appropriate emergency response capabilities that are routinely validated to provide the emergency response organization (ERO) with sufficient depth and competence. Dedicated emergency response facilities and systems are maintained in a constant state of readiness and offsite response interfaces and support capabilities are properly documented and, with few exceptions, evaluated for effectiveness during site exercises.

The lessons learned assessment identifies that sites generally have well-developed and effectively implemented emergency management programs, and exercise observations revealed high levels of proficiency in implementing some response elements. It also identifies areas of common weakness that include the effectiveness of emergency preparedness exercises, ERO communications, and ERO proficiency.

The special study was an extensive effort to examine DOE’s preparedness and capabilities to use social media in responding to an emergency. The study found the DOE complex is not fully
prepared to use social media effectively during an emergency and is hindered by fundamental weaknesses, which include the lack of a Headquarters-level strategic framework that establishes an emergency public information social media approach for Headquarters and the sites.

G. EA FY 2021 Independent Oversight Assessments by DOE Location / Entity

<table>
<thead>
<tr>
<th>Location / Entity</th>
<th>Safeguards &amp; Security</th>
<th>Cybersecurity</th>
<th>Nuclear Safety &amp; Environment</th>
<th>Nuclear Engineering &amp; Safety Basis</th>
<th>Emergency Management</th>
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<td>NATIONAL NUCLEAR SECURITY ADMIN.</td>
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<td>Nine Locations</td>
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<td>SCIENCE and ENERGY</td>
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<td>Lawrence Berkeley National Lab.</td>
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<td>Oak Ridge National Lab.</td>
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<td>Office of Scientific and Technical Information</td>
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<td>Pacific Northwest National Lab.</td>
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<td>ENVIRONMENTAL MANAGEMENT</td>
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<td>Hanford Site</td>
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<td>Portsmouth/Paducah Project Office</td>
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<td>Savannah River Site</td>
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<td>Waste Isolation Pilot Plant</td>
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<td>SOUTHEASTERN POWER ADMIN.</td>
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<td>Crosscut/Lessons Learned Assessments</td>
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IV. Independent Oversight Reports Listing

This section contains a list of independent oversight assessment reports issued in FY 2021 in chronological order by subject area. Reports identified in the safeguards and security and cybersecurity sections contain classified and controlled unclassified information and, therefore, are not available to the public. Report titles for assessments of special access programs are not identified in this report or on the EA website. The nuclear safety and environment, nuclear engineering and safety basis, and emergency management report titles link to the corresponding reports on the EA website.

A. Safeguards and Security

4 Table does not include the two COVID-19-related reports described in the third paragraph of section III.
1. Safeguards and Security Multi-Topic Assessment of the Oak Ridge National Laboratory, March 16, 2021
2. Focused Assessment of the Kansas City National Security Campus, Facility Clearance Process, March 16, 2021
3. Safeguards and Security Multi-Topic Assessment at the Lawrence Berkeley National Laboratory, April 9, 2021
4. Results of Limited-Notice Performance Tests at the Los Alamos National Laboratory, May 17, 2021
5. Special Assessment of the Department of Energy’s Insider Threat Program, June 22, 2021
8. Independent Limited-Notice Performance Test Assessment of Safeguards and Security at Sandia National Laboratories, New Mexico, September 20, 2021

B. Cybersecurity
1. Independent Programmatic and Technical Assessment of the Office of Scientific and Technical Information Unclassified Cybersecurity Program, December 2020
2. Independent Programmatic and Technical Assessment of the Nevada National Security Site Unclassified Cybersecurity Program, April 2021
3. Independent Technical Assessment of the National Nuclear Security Administration Production Office Unclassified Cybersecurity Program, April 2021
4. Independent Programmatic and Technical Assessment of the National Nuclear Security Administration Classified and Unclassified Cybersecurity Program, May 2021
5. Independent Programmatic and Technical Assessment of the Southeastern Power Administration Unclassified Cybersecurity Program, May 2021
6. Independent Programmatic and Technical Assessment of the Portsmouth/Paducah Project Office Unclassified Cybersecurity Program, June 2021
7. Independent Programmatic and Technical Assessment of the Pacific Northwest National Laboratory Classified Cybersecurity Program, July 2021
8. Independent Programmatic and Technical Assessment of the Emergency Communications Network Classified Cybersecurity Program, July 2021
9. Independent Programmatic and Technical Assessment of the Kansas City National Security Campus Classified and Unclassified Cybersecurity Program, July 2021
10. Independent Programmatic and Technical Assessment of the Oak Ridge National Laboratory Classified and Unclassified Cybersecurity Program, August 2021
12. Independent Programmatic and Technical Assessment of the Nevada National Security Site Mission Support and Test Services, LLC Classified Cybersecurity Program, September 2021

C. Nuclear Safety and Environment
1. Assessment of Issues Management at the Savannah River Site SRNS Facilities – November 2020
3. Underground Ventilation and Geotechnical Engineering Assessment at the Waste Isolation Pilot Plant – April 2021
4. Independent Follow-up Assessment of Fire Protection at the Lawrence Livermore National
D. Nuclear Engineering and Safety Basis

1. Preliminary Documented Safety Analysis Assessment at the Hanford Site Capsule Storage Area – January 2021
2. Safe Interim Storage of Spent Nuclear Fuel Assessment at the Hanford Site – March 2021
3. Assessment of the Triad National Security, LLC Nuclear Criticality Safety Program at the Los Alamos National Laboratory – May 2021
4. Safety Basis Assessment at the Hanford Site Tank Farms Tank Side Cesium Removal Facility – June 2021

E. Emergency Management

2. Integration of Social Media into Emergency Public Information – January 2021
3. Emergency Preparedness Capability Assessment at the Y-12 National Security Complex – April 2021
4. Emergency Preparedness Capability Assessment at the Pantex Plant - July 2021

V. Conclusions and Recommendations

EA issued 37 independent oversight reports documenting security and safety assessments of 20 DOE (including National Nuclear Security Administration and Power Marketing Administration) locations in FY 2021. This included an assessment of DOE’s response to the COVID-19 pandemic directed by the previous Secretary of Energy to identify lessons learned and provide recommendations for increasing resilience to future crises that could impact the DOE enterprise. EA did not identify any immediate or major risks warranting shutdown of operations. Overall, DOE’s security and safety programs are consistently fulfilling the objective of protecting workers, the public, and national security, continuing to do so throughout the pandemic, although management attention and improvement are needed in some areas.

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- Improving corrective action and issues management processes;
• Enhancing crisis response plans, authorities, and capabilities in light of the COVID-19 pandemic; and
• Improving nuclear safety, cybersecurity, physical and information safeguards and security, and emergency management programs.