



U.S. DEPARTMENT OF
ENERGY

**Department of Energy
Activities Relating to the
Defense Nuclear
Facilities Safety Board
Fiscal Year 2016**

**Report to Congress
April, 2017**

**United States Department of Energy
Washington, DC 20585**

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Message from the Secretary

The Department of Energy (Department or DOE) is required¹ to submit a written annual report to Congress addressing the Department's activities related to the Defense Nuclear Facilities Safety Board (DNFSB or Board). The Department welcomes the opportunity to provide this annual report to Congress describing the Department's activities in fiscal year 2016 (FY16) that relate to the DNFSB.

The Board has a critical advisory role within the Department's safety framework for defense nuclear facilities. Its expertise in reviewing the content and implementation of standards and directives relating to the design, construction, operation, and decommissioning of the Department's defense nuclear facilities helps strengthen the safety protocols at the Department's facilities. We welcome the Board's advice and recommendations. Together, through healthy exchanges, DOE and the Board can fulfill our shared goal of protecting the public health and safety at the Department's defense nuclear facilities. I look forward to continuing to work closely with the Board in the coming year and welcome Congress' review of the attached *Department of Energy Activities Relating to the Defense Nuclear Facilities Safety Board Fiscal Year 2016*.

Highlights of the Department's accomplishments are included in the report's Executive Summary. The status of the Department's actions in response to Board recommendations and other Board input are included in the body of the report.

The following members of Congress are receiving this report:

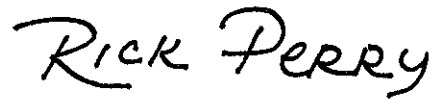
- **The Honorable Lisa Murkowski**
Chairman, Senate Committee on Energy and Natural Resources
- **The Honorable Maria Cantwell**
Ranking Member, Senate Committee on Energy and Natural Resources
- **The Honorable Thad Cochran**
Chairman, Senate Committee on Appropriations
- **The Honorable Patrick Leahy**
Vice Chairman, Senate Committee on Appropriations
- **The Honorable Lamar Alexander**
Chairman, Senate Subcommittee on Energy and Water Development
- **The Honorable Dianne Feinstein**
Ranking Member, Senate Subcommittee on Energy and Water Development

¹ Section 316(b) of the Atomic Energy Act of 1954, as amended, *codified at* 42 United States Code § 2286e(b).

- **The Honorable John McCain**
Chairman, Senate Committee on Armed Services
- **The Honorable Jack Reed**
Ranking Member, Senate Committee on Armed Services
- **The Honorable Deb Fischer**
Chairman, Senate Subcommittee on Strategic Forces
- **The Honorable Joe Donnelly**
Ranking Member, Senate Subcommittee on Strategic Forces
- **The Honorable Rodney Frelinghuysen**
Chairman, House Committee on Appropriations
- **The Honorable Nita Lowey**
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Chairman, House Subcommittee on Energy and Water Development
- **The Honorable Marcy Kaptur**
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Chairman, House Subcommittee on Strategic Forces
- **The Honorable Jim Cooper**
Ranking Member, House Subcommittee on Strategic Forces
- **The Honorable Greg Walden**
Chairman, House Committee on Energy and Commerce
- **The Honorable Frank Pallone**
Ranking Member, House Committee on Energy and Commerce

If you have any questions or need additional information, please contact me, or the Assistant Secretary for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

A handwritten signature in black ink that reads "Rick Perry". The letters are cursive and fluid, with a prominent "R" and "P".

Rick Perry

Executive Summary

The Department welcomes the opportunity to provide this annual report to Congress.² This report describes the Department's key FY16 initiatives and activities related to the Board. The Department has a unique role as owner, operator, and regulator of the Nation's defense nuclear facilities, and the DNFSB provides additional expertise to enhance the Department's nuclear safety posture at these facilities.

DOE uses a multilayered approach to nuclear safety. The Department establishes specific nuclear safety requirements, using Federal regulations, Departmental directives, and technical standards. These include several levels of safety oversight, first by DOE site contractors, followed by DOE program and independent oversight offices. This system provides safety implementation and thorough responses to nuclear safety issues potentially affecting DOE workers, the public, and the environment. The Department also conducts regulatory enforcement actions to achieve compliance with nuclear safety requirements.

The Department has undertaken safety initiatives and activities to reinforce and ensure nuclear safety performance. These initiatives respond to issues identified by the Board, as well as issues proactively identified by the Department through (1) site, facility, and program office self-assessments; (2) independent oversight activities; and (3) safety improvement initiatives and activities.

Progress on Initiatives and Activities

Waste Isolation Pilot Plant, Carlsbad, NM - The Waste Isolation Pilot Plant (WIPP) in Carlsbad, NM, plays a critical role in the transuranic (TRU) waste disposal strategy of the Department. This facility closed after two incidents in February 2014, an underground fire and a radioactive release. Recovery actions have subsumed its main mission. The Department has restored the safety management programs and continues efforts to restore operations and maintenance work to a fully functional status. Senior contractor and Federal leaders are focusing on efforts to sustain improvements in the conduct of operations, the contractor assurance system, and organizational safety culture.

The February 2014, rupture of a drum of transuranic waste packaged by the Los Alamos National Laboratory resulted in a release of radioactivity. The DOE accident investigation of this incident resulted in significant improvements to the National TRU Program (NTP). The DOE changed the NTP to strengthen the flow down of requirements and the certification and audit process. This will ensure nuclear waste generator sites transport only acceptable waste to the facility.

² In accordance with Section 316(b) of the Atomic Energy Act of 1954, as amended, *codified at* 42 United States Code § 2286e(b).

The WIPP Documented Safety Analysis incorporated these changes. Additionally, Los Alamos National Laboratory's (LANL) legacy TRU waste remediation program was reassigned from National Nuclear Security Administration (NNSA) to the Office of Environmental Management (EM).

In December 2016, DOE resumed disposal operations at WIPP upon demonstration that it was safe to do so, with the understanding that "safety first" is the clear expectation behind every decision and activity undertaken in the WIPP recovery effort. DOE continues to keep the community and a wide-range of stakeholders, including the Board, informed during the restart of operations and emplacement process.

Los Alamos National Laboratory Nuclear Safety Issues – In 2016, the LANL Plutonium Facility (PF-4) operating contractor made significant progress in completing corrective actions required to restart programmatic operations following the June 2013 pause in fissile material operations. The pause was ordered by the LANL Laboratory Director to correct weaknesses identified in criticality safety and conduct-of-operations programs. NNSA continues efforts to enhance the seismic safety of the PF-4 facility. Structural analyses and modifications are ongoing to improve overall seismic stability. In addition, the Laboratory advanced efforts to improve the PF-4 safety margin by removing and repackaging material-at-risk.

Waste Treatment and Immobilization Plant – The Waste Treatment and Immobilization Plant (WTP) is one of the largest undertakings by the Department to clean up legacy waste. The WTP will process and stabilize 56 million gallons of radioactive and chemical waste from the Hanford site. The largest portion of the WTP project is the Pretreatment Facility, and the Department is currently supporting analysis and design of the facility by the contractor. Efforts to resolve several key technical issues continue to progress. The Department continues to pursue efforts to restart the Pretreatment and High-Level Waste facility design activities, including the demonstration of sound resolutions to address key technical issues.

Emergency Preparedness and Response – The Department continues to make progress executing the Implementation Plans (IP) associated with two Board recommendations (Recommendation 2014-1, *Emergency Preparedness and Response* and Recommendation 2015-1, *Emergency Preparedness and Response at the Pantex Plant*). Under the IP for Recommendation 2014-1, DOE revised and issued DOE Order 151.1D, *Comprehensive Emergency Management System*, in August 2016. This clarified and provided additional requirements in the following areas: (1) response to severe natural hazards events; (2) reliability and habitability of emergency response facilities; (3) criteria for emergency preparedness training, drills, and exercises; and (4) addressing vulnerabilities identified during independent assessments. It also resolved conflicts, addressed omissions and deficiencies, and clarified language that led to inconsistent interpretations of DOE's emergency preparedness requirements.

Progress on Board Recommendations

This report also documents the closure of one Board recommendation, *Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers*, and the issuance of one new Board recommendation, *Emergency Preparedness and Response at the Pantex Plant*, in FY16. There are six open recommendations in place at the end of FY16. This report discusses these in detail.

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DEPARTMENT OF ENERGY ACTIVITIES RELATING TO THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD FISCAL YEAR 2016

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I. Legislative Language

This report is prepared and delivered to Congress in accordance with Section 316(b) of the Atomic Energy Act of 1954, as amended, *codified at* 42 United States Code (U.S.C.) § 2286e(b):

DOE REPORT. The Secretary of Energy shall submit to the Committees on Armed Services, Appropriations, and Energy and Commerce of the House of Representatives and the Committees on Armed Services, Appropriations, and Energy and Natural Resources of the Senate each year, at the same time that the President submits the budget to Congress pursuant to section 1105(a) of Title 31 [United States Code], a written report concerning the activities of the Department of Energy under this subchapter during the year preceding the year in which the report is submitted.

II. Background and Organization

The DNFSB is an independent executive branch agency established by Congress in 1988 to provide independent technical analysis, advice, and recommendations to the Secretary of Energy regarding public health and safety issues at the Department's defense nuclear facilities (shown in Figure 1). The Board:

- Reviews and evaluates the content and implementation of standards and directives relating to the design, construction, operation, and decommissioning of the Department's defense nuclear facilities;
- Performs analyses of design and operational data;
- Performs investigations of Departmental events and practices;
- Reviews the design of new defense nuclear facilities; and
- Makes recommendations to DOE relating to its defense nuclear facilities, including operations of such facilities, standards and research needs, for the purpose of ensuring adequate protection of public health and safety.

The Board and the Department communicate and interact through a variety of mechanisms, including formal Board recommendations, formal reporting requirements, Board letters requesting information, letters providing suggestions, letters providing information (e.g., staff trip reports and reports on specific issues), Board-sponsored public meetings and hearings, Board briefings, discussions, and Board member site visits.

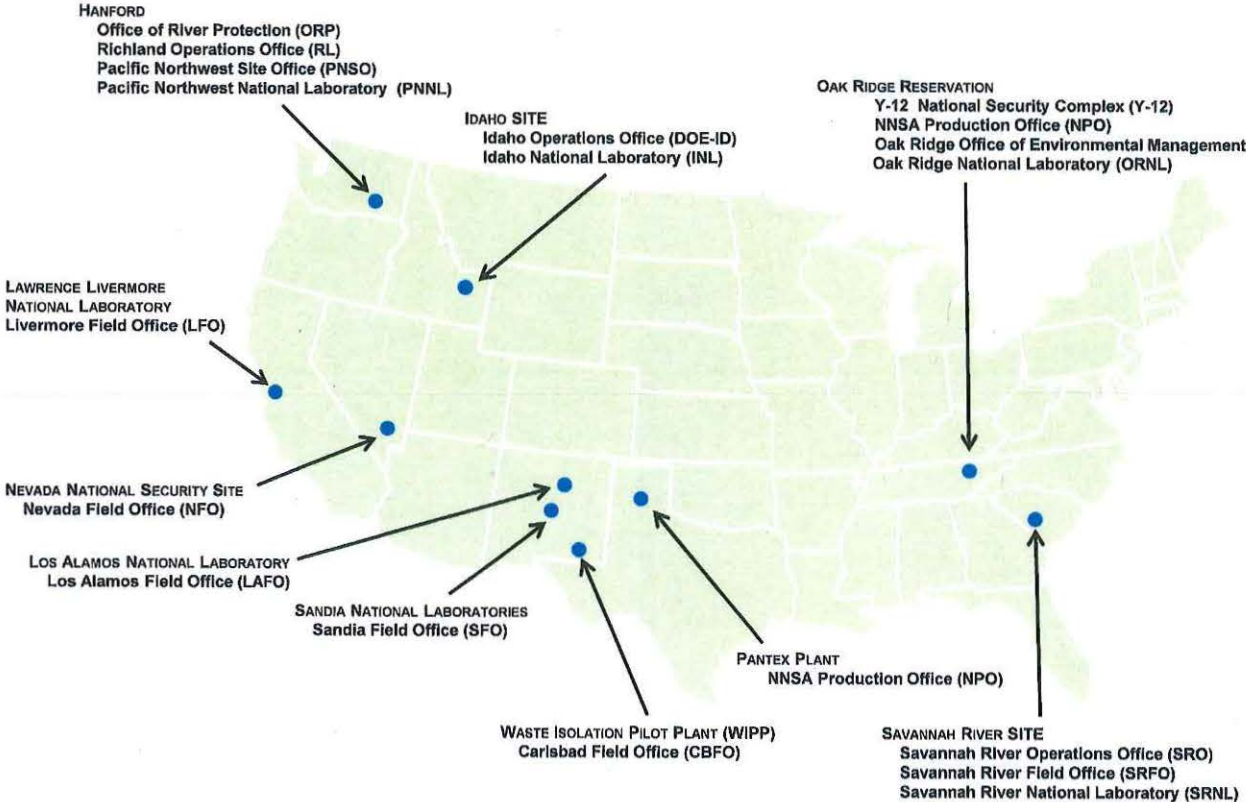


Figure 1. Locations of DOE Defense Nuclear Facilities

III. Departmental Nuclear Safety Initiatives and Activities

This section describes the major FY16 initiatives and activities the Department undertook to improve and ensure nuclear safety. These initiatives respond to issues identified by the Board and the Department through site, facility, and program office self-assessments. Independent oversight activities by the Office of Enterprise Assessment (EA) and the Department’s Central Technical Authorities help to identify nuclear safety issues for both Federal and contractor employees. The Department protects its workers, the public, and the environment from nuclear hazards through a rigorous, proactive nuclear safety program and a robust nuclear safety regulatory framework.

A. Waste Isolation Pilot Plant

As the Nation’s repository for the disposal of TRU radioactive waste generated by atomic energy defense activities, WIPP is a cornerstone of DOE’s cleanup effort. Located in southeastern New Mexico, 26 miles east of Carlsbad, WIPP’s facilities include disposal rooms

excavated in a stable salt formation 2,150 feet underground. Waste disposal began at WIPP on March 26, 1999. DOE suspended operations at WIPP following two unrelated incidents in February 2014 - an underground fire and a radioactive release. Resumption of WIPP operations are essential for the Department to meet state regulatory agreements.

The DOE Accident Investigation Board (AIB) issued its Phase II Report for the radiological release incident on April 16, 2015. The report identified the cause of the release as an exothermic reaction of incompatible materials that led to an over-pressurization of the drum. This overpressure breached the drum integrity and released a portion of the drum's radioactive contents into the WIPP underground mine and subsequently into the environment. The AIB report identified a number of weaknesses in the WIPP safety basis and safety management programs. The corrective actions documented in the corrective action plans will strengthen WIPP's nuclear safety, fire protection, emergency management, and radiological control and maintenance programs.

The management of TRU waste programs within the Federal and contractor organizations put improvements in place to ensure adequate protection and to prevent a reoccurrence. DOE reestablished the WIPP safety management programs, including revising the Documented Safety Analysis (DSA) to comply with DOE Standard 3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, requirements. DOE implemented the revised WIPP DSA on May 29, 2016. Key safety management program requirements in the DSA flow down to the revised WIPP waste acceptance criteria (WAC) – effective July 5, 2016. The revised WIPP WAC requires: (1) enhanced acceptable knowledge documentation; (2) expanded review of procedures (and control of any changes); (3) additional thorough chemical compatibility evaluations of TRU waste destined for WIPP; and (4) onsite reviews of waste generator activities. Organizational realignments at the DOE Carlsbad Field Office and EM Headquarters (HQ) during FY16 established clear roles and responsibilities, including increased independence of Federal Oversight of the NTP activities.

In August 2016, DOE conducted comprehensive operational readiness reviews of WIPP's programs, procedures, and DSA, including contractor readiness and self-assessments to ensure a deliberate path-forward to safely restart radioactive handling and waste emplacement operations.

In FY16, DOE increased the WIPP ventilation capacity to support underground operations. The interim ventilation system (IVS) began operations in September 2016. The IVS increased airflow in the underground to approximately 110,000 cubic feet per minute, which allowed for the increased use of diesel engines for limited mining, roof bolting and waste operations.

DOE continues to improve emergency planning and preparedness through notice and no-notice drills and exercises. On June 22, 2016, more than 100 external evaluators assessed the performance of WIPP safety management program's exercise, which included a simulated underground fire and radiological release. DOE evaluated exercise participants on their ability

to follow and implement plans and procedures, and their overall response to simulated events. Post-exercise critiques identified activities that went well and areas where there were opportunities for improvement.

DOE has resumed disposal operations at WIPP. "Safety first" is the clear expectation behind every decision and activity undertaken in the WIPP recovery effort. DOE has been keeping the community and a wide-range of stakeholders, including the Board, informed during the restart readiness process and continues to hold public meetings for news and facility updates.

B. Los Alamos National Laboratory

Plutonium Facility Seismic Safety

The national security mission of PF-4 is the nation's only operational, full capability plutonium science and manufacturing facility. DOE and NNSA have increased the seismic safety margin of PF-4 through the execution of the implementation plan (IP) for Recommendation 2009-2, *LANL Plutonium Facility Seismic Safety*. LANL annually updates its project execution strategy that tracks current and planned upgrades for improving PF-4 safety, including seismic safety.

NNSA will continue to make substantial improvements to enhance the PF-4 capability to withstand a severe seismic event. There were ongoing projects in FY16 to upgrade roof girders and reduce the material at risk by removing it from the facility or packaging it in containers that are more robust. In addition, NNSA established a joint working group between NNSA HQ, NNSA Los Alamos Field Office, and Los Alamos National Security, LLC (LANS), to develop a request for proposal (RFP) for NNSA to solicit cost, scope and schedule for conducting a dynamic, non-linear analysis of selected aspects of the facility. NNSA will use the results of this non-linear analysis to inform additional PF-4 seismic performance capability actions or studies. The joint working group made significant progress throughout FY16, and a RFP is under development. NNSA continues to engage the DNFSB in oversight of this effort.

Operations in the Plutonium Facility

Resumption of operations at the LANL PF-4 facility was a major effort throughout FY16. The Department continued to invest its subject matter expertise directly alongside LANL management to facilitate a safe, efficient restart of operations. The number of qualified criticality safety engineers required for PF-4 operations continued improving throughout FY16. Over 20 criticality safety engineers now support LANL operations from a low point of four engineers two years ago. LANS is focusing on hiring and training efforts to increase the number of criticality safety engineers and is ensuring that the program continues to improve with a goal of being best in class.

In FY16, NNSA and LANL completed all required readiness assessments to restart operations at PF-4. Several primary operations will continue to go through the readiness review process until achievement of full operational capability.

Area G Waste Storage and Improperly Remediated Nitrate Salt Waste

As of the end of FY16, 60 drums of RNS waste are stored at LANL Area G in Technical Area 54. Efforts to treat these drums to eliminate the possibility of a similar exothermic reaction that occurred at WIPP have been underway. The DOE WIPP Phase II Accident Investigation Board Report indicated improperly remediated nitrite salt waste generated at LANL was the source of the radioactivity. The report identified the cause of the release as an exothermic reaction of incompatible materials that led to over-pressurization of the drum. This overpressure breached the drum integrity and released a portion of the drum's radioactive contents into the underground mine and subsequently to the environment via the ventilation system.

After considerable study and experimental evaluation of the reactions that took place in the breached drum at WIPP, DOE developed a disposition path for the RNS drums. This path would entail transportation of the drums from Area G to the Waste Characterization, Reduction, and Repackaging Facility (WCRRF), disassembling the drums, and treating the contents of the drums within the glovebox enclosure. This process will eliminate the possibility of a thermal runaway event and render the drums acceptable for eventual disposal at WIPP.

The legacy waste activities at the lab are under transition from NNSA to EM programmatic responsibility. During this transition, NNSA retains the safety basis responsibility for these activities. NNSA, EM and LANL have modified the Area G safety basis documents resulting in additional controls to enhance the safety of the storage of the drums. These controls and measures ensure adequate protection to the workers, public and environment.

The RNS disposition activities required modification to the safety basis documents for On-Site Transportation and the WCRRF also. NNSA, EM and LANL completed these modifications in FY16, through addenda to the existing safety basis documents in order to establish an adequate control selection for safe execution of the remediation activities. These addenda were part of the Safety Evaluation Report (SER) approved by the NNSA Cognizant Secretarial Officer (CSO) for Safety on October 6, 2016. CSO approval is required due to the potential consequences of a radiological release during these operations. DOE anticipates treatment of all drums started but not completed prior to the end of the fiscal year.

Safety Basis for Transuranic Waste Processing at the Waste Characterization, Reduction, and Repackaging Facility and Safe Storage at Technical Area 54 Area G

The LANL WCRRF facility processes the nitrate salt drums for compliance with the WIPP WAC. The Technical Area 54 Area G facilities provide waste characterization, staging, and interim safe

storage of TRU waste containers bound for disposal at WIPP. TRU waste operations at WCRRF and Area G have been severely restricted since the 2014 WIPP incident.

The accident report of the 2014 WIPP radiological release incident found that the safety basis document for WCRRF did not thoroughly describe or evaluate the nitrate salt processing or waste storage activities. The report concluded that the LANL Unreviewed Safety Question process was ineffective in capturing changes related to processing of nitrate salts, and ensuring that important procedure changes related to the processing of nitrate salts were evaluated for impacts to the safety basis.

In FY16, DOE and LANL continued to make extensive changes to the WCRRF and Area G safety basis documents. The Potential Inadequacy of the Safety Analysis (PISA) process is a safety basis process used when the safety analysis supporting the NNSA approved safety basis may not be bounding or may be otherwise inadequate. During the process of revising and improving the WCRRF and Area G safety basis documents, LANL generated several PISAs, resulting in positive determinations, which ultimately resulted in a number of new safety controls. Examples of new safety basis controls at Area G in Dome 375 for the safe storage of nitrate salt waste include the following: (1) installation of pressure relief devices with supplemental filtration; (2) fire suppression system and storage room temperature controls; (3) establishing and maintaining adequate spacing in case of wildland fires; and (4) storage container movement controls, temperature monitoring, and visual inspections. Examples of new safety basis controls that NNSA and LANL will implement at WCRRF prior to restart of any TRU waste processing of nitrate salt waste include: (1) combustible material controls; (2) forklift prohibition; (3) material-at-risk limits; (4) hot work prohibitions; (5) temperature controls; and (6) use of non-sparking tools and processes.

An integrated project team made up of safety basis subject matter experts from NNSA, EM, and LANL contractors, continue to collaborate to address the AIB report and PISA safety basis issues.

New Transuranic Waste Facility at Los Alamos National Laboratory

The TRU Waste Facility (TWF) project is part of a comprehensive, long-term strategy to consolidate hazardous and radioactive waste operations into a smaller area that can operate safely, securely, and effectively. The TWF will safely receive, handle, characterize, store, and prepare packaged TRU waste containers to WIPP. LANL program facilities generate the TRU waste. The facility is designed, constructed, and will be operated as a Hazard Category 2 nuclear facility per DOE-STD-1027, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*. NNSA, EM, and LANS resolved several Board-identified issues in FY16 with possible affect to the design and functional classification of safety-related controls. The TWF Documented Safety Analysis and Technical Safety Requirements addressed these issues. Several open issues concerning inadequate analyses of potentially high consequence accidents affecting facility workers and

safety controls to address a postulated wildland fire are not addressed. Other open issues deal with analysis of radiological consequences to workers and the public, as well as strategies for ensuring operability of the fire protection system during cold weather. A SER was issued on December 6, 2016, which requires classification of the fire suppression system as safety significant, by the first annual update. LANS is currently working with NNSA on readiness review activities. All readiness activities to support full operations of the facility are scheduled for completion in FY17.

C. Waste Treatment and Immobilization Plant at Hanford

The Department is working to construct and operate the WTP facilities and infrastructure to safely immobilize and dispose of Hanford liquid and sludge tank waste. The WTP consists of five facilities: (1) Analytical Laboratory, (2) Balance of Facilities, (3) Low-Activity Waste Facility, (4) High-Level Waste Facility, and (5) Pretreatment Facility. The Department also plans construction of additional infrastructure facilities to support the operation of these five facilities.

The plant design will process tank farm waste over roughly a 40-year period. The original plan required waste to be processed through the Pretreatment Facility, separating it into a low-activity waste stream to be vitrified in the Low-Activity Waste Facility and a high-level waste stream to be vitrified in the High-Level Waste Facility. The Analytical Laboratory and Balance of Facilities support these vitrification activities.

Construction of the Low-Activity Waste Facility, Balance of Facilities, and Analytical Laboratory, along with the work addressing feeding low-activity waste directly to the Low-Activity Waste Facility, is ongoing. Efforts continue to resolve technical issues associated with the pretreatment and the high-level waste facilities. In FY16, the Department continued focus on the start-up and operation of the Low-Activity Waste Facility, Balance of Facilities, and Analytical Laboratory as they are nearest to completion. These are required to begin immobilization of low-activity waste as soon as practicable. The Department plans to support the analysis and design of a new Pretreatment Facility for this initiative. DOE will address in the near-term, the most mobile tank waste — the supernate — will work in parallel to resolve the technical and design issues associated with the High-Level Waste and Pretreatment Facilities.

DOE and the DNFSB are engaged to resolve the following project issues:

- Potential criticality in process vessels;
- Potential generation and accumulation of hydrogen in process vessels;
- Hydrogen gas controls: hydrogen in piping and ancillary equipment;
- Heat transfer analyses for process vessels;
- Pulse jet mixer control;
- Inadequacies in spray leak methodology;
- Safety controls for ammonia hazards;

- Erosion and corrosion of piping, vessels and pulse jet mixer nozzles;
- Design and construction of the electrical distribution system;
- Formation of sliding beds in process piping;
- Ability to obtain representative samples;
- Volcanic ash fall hazard;
- Unanalyzed melter accidents;
- Hydrogen control strategy for the High-Level Waste Facility; and
- Seismic categorization of safety controls.

Formal correspondence between the DNFSB and DOE identified these project technical issues. Identified solutions will be applied to the affected WTP facilities. Significant progress during FY16 was made on resolving the Pretreatment facility issues associated with: (1) criticality in process vessels; (2) accumulation of hydrogen in process vessels; (3) heat transfer analysis for process vessels; (4) hydrogen gas controls in piping and ancillary equipment; and (4) pulse jet mixer control. DOE routinely discussed progress on the resolution of these issues with the DNFSB staff.

D. Integrating Safety into the Design of Defense Nuclear Facilities

The Department maintains its interest in strengthening project management across the complex. In May 2016, DOE completed the revision to DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*. This revision included requirements for the design and management of Hazard Category 1, 2 and 3 nuclear facilities.

In a letter dated April 21, 2015, the Board proposed that the Department and Board staff conduct a joint review of the processes by which the two agencies interact to identify potential safety issues in the design and construction of new defense nuclear facilities. In DOE's response, dated June 12, 2015, DOE agreed that such a review would be beneficial to both agencies. FY16 activities under this effort drew considerable subject matter expertise from DOE and the Board, culminating with the issuance of the final joint working group report in late FY16. Based upon the working group's conclusions and recommendations, DOE and the Board are considering actions to clarify policies and/or directives to improve interactions, while maintaining the independence of the Board to provide advice, and the authority of the Department to execute its project management responsibilities.

E. Aging Infrastructure at the Pantex Plant

To address aging and non-vendor supported safety systems, NNSA began a multi-year bay and cell modernization effort specifically aimed at replacing electrostatic discharge flooring, flame detection systems (FDS), continuous air monitoring systems, and high-pressure fire loop (HPFL) lead-in piping. Pantex undertook several actions in this effort in FY 16. These included site installation of the fiber backbone for updated safety systems, such as the FDS, to improve communications during normal operations and emergencies, as well as the installation of the

FDS in two operating bays. Additionally, NNSA completed the installation of five HPFL lead-ins. Pantex continues to experience HPFL lead-in pipe breaks, averaging 1-2 per year. The replacement strategy provides additional flexibility in addressing aging or inoperable systems.

Pantex's electrical distribution system is rapidly deteriorating, which creates the potential for a high-risk failure. Since April 2015, Pantex has experienced significant electrical events that resulted in the need to move loads to other circuits, splitting loads, and replacing blown arresters. Sudden, unplanned outages have increased equipment failures and negatively affected in-progress operations. The site has outlined key electrical infrastructure modernization needs and is working with NNSA to establish a portfolio of projects to address these needs, executable over the next few years.

General infrastructure (i.e., underground utility distribution, roads, light poles, concrete pads, etc.) conditions have degraded over time, resulting in the failure of some components and significant evidence of excessive wear in others. In addition, utility systems have exceeded their design life. Although progress to improve maintenance effectiveness is occurring, the aged facility and equipment degradation is outpacing the additional maintenance work.

F. Emergency Preparedness and Response

The Department is executing a number of actions associated with two IPs to improve its emergency preparedness and response capabilities; The IP for Recommendation 2014-1, *Emergency Preparedness and Response*, applies to the entire DOE complex and the IP for Recommendation 2015-1, *Emergency Preparedness and Response at the Pantex Plant*, applies specifically to Pantex. These recommendations are addressed in section IV.b of this report.

In May 2016, the Office of Emergency Management Assessment within the Enterprise Assessment Office conducted a thorough review of lessons learned from the Department's 2015 assessments, in the areas of hazardous materials program technical planning basis, emergency response performance, and emergency preparedness.

EA developed the following recommendations for senior management. These lessons learned apply in general terms to the nuclear weapons complex.

- (1) Ensure the site emergency management program adequately minimizes the risk to site's mission, particularly focusing on whether emergency planning hazards assessments provide an appropriate balance between conservatism and realism, and whether the level of effort spent on emergency responder training and exercise programs delivers sufficient proficiency;
- (2) Stress the importance of full and open communication during emergency responses so that all parties (including offsite organizations) have a common operational picture; and

- (3) Actively promote the value of continuous improvement in the emergency management program through self-critical assessments and exercise evaluations, diligent resolution of identified issues, and sharing of lessons learned with other sites.

G. Environmental Management Nuclear Safety Initiatives

In FY16, the Chief of Nuclear Safety (CNS) for EM continued initiatives to promote technical responsibility and nuclear safety within EM and at its facilities. The CNS performs oversight, provides technical support, and executes technical activities to support nuclear operations. Examples of specific activities in FY16 include:

- Continuing to support the Next Generation Attenuation – East project to develop a new seismic ground motion model for central and eastern North America;
- Providing technical expert reviewers to support the Office of Project Management Oversight and Assessments project peer reviews at EM nuclear facilities;
- Conducting over 20 field operational awareness visits and assessments guided by the CNS nuclear facility risk ranking;
- Reviewing and concurring on revisions to nuclear safety directives and technical standards;
- Managing EM’s differing professional opinion process and working with sites to ensure the site programs are developed;
- Providing technical expert reviewers for the 30% design review of the Low Activity Waste Pre-treatment System at Hanford;
- Providing technical expertise to the EM Oak Ridge Office to establish the safety strategy for re-purposing Building 2026 to down-blend U-233;
- Providing technical support for the LANL transition of TRU waste operations, including development of a new safety basis;
- Providing technical support for the review of LANL site-specific dispersion analysis to support safety basis development;
- Participating in the DOE-DNFSB joint project management review of the safety-in-design process, identifying and recommending improvements to DOE and DNFSB senior leadership;
- Participating on the DOE nuclear safety research and development committee and the evaluation of submitted proposals for FY16;
- Contributing to multiple technical meetings and documents sponsored by the International Atomic Energy Agency, international standards organization, that benefit nuclear safety and quality;
- Representing DOE on the American Society of Mechanical Engineers/American Nuclear Society Joint Committee for nuclear risk management;
- Representing DOE on the ASME Committee on Nuclear Quality Assurance and the U. S. Government on ISO Technical Committee 85; and
- Developing a standard review plan for conducting 30-60-90% design reviews for major nuclear construction projects.

H. National Nuclear Security Administration Nuclear Safety Initiatives

In FY16, the NNSA Office of Safety, Infrastructure and Operations (NA-50) undertook initiatives to promote technical expertise, qualification, responsibility, and nuclear safety at NNSA facilities. NA-50 performs oversight, provides technical support, and executes technical activities supporting nuclear operations at NNSA facilities. For example, in FY16, NA-50:

- Completed accreditation of the NA-51 technical qualification program and expanded the process to all of NA-50. This program develops and maintains qualification of personnel responsible for the safety of NNSA nuclear facilities and was the first accreditation of a DOE HQ organization.
- Continued work to improve the seismic resilience of the Los Alamos Plutonium Facility (PF-4). This involved developing a test program for the column capitals in the facility, which are the components with the highest demand/capacity ratio in the current analysis.
- Resolved two differing professional opinions submitted by Federal staff, ensuring that all voices are heard when opinions differ regarding nuclear safety.
- Supported Field Offices by conducting or participating in over 50 technical reviews of nuclear safety programs and activities to ensure safe operations of NNSA nuclear facilities. Continued coordination to support field oversight through the site integrated assessment plan, leveraging Field and HQ resources to maximize coverage and effectiveness
- Assisted Los Alamos in an overhaul of its readiness preparation capabilities – resulting in remarkable improvement in the safe startup of the plutonium facility and Los Alamos facilities in general. Demonstrated effectiveness during the restart of all PF-4 mission essential plutonium production operations at Los Alamos, helping to bring this vital nuclear facility back on line safely. Continued to provide expert nuclear criticality safety technical assistance directly to Los Alamos National Laboratory.
- Participated and assisted in the development of safety basis documents to support the safe storage and handling of drums of the same composition that as the one that initiated the accident at the WIPP.
- Halted the growth of deferred maintenance in NNSA nuclear facilities, slowing the degradation of nuclear facilities.
- Initiated an overhaul of the NNSA governance system, which established the framework for a new governance approach that takes advantage of lessons learned over the past 15 years, and the recent recommendations of external advisory panels.
- Began development of automated processes to evaluate the health of safety management programs directly supporting implementation of the safety basis at NNSA facilities. When mature, this process will allow for the sharing of lessons learned and best practices across the enterprise.
- Continued support of the DOE-wide Safety Culture Improvement Panel. Incorporating best practices into policy and oversight guidance. Continued to provide training in a safety conscious work environment (SCWE).

IV. FY16 Progress on Board Recommendations

A. Overview

The Board issues recommendations to the Secretary for specific measures the Department should adopt to ensure adequate protection of public health and safety. The Secretary of Energy is required to respond to each Board recommendation within 45 days of its publication in the *Federal Register* (or longer, if granted additional time). In addition, the Secretary must provide an IP to the Board within 90 days after publication in the *Federal Register* of the Secretary's acceptance of all or part of a recommendation (or longer, upon appropriate notice).

Legislation requires the Secretary to complete the IP within one year of issuance, or if the IP takes more than one year to complete, a report to Congress is required. The scope and technical complexity of the safety issues addressed in DOE's IPs have always required more than one year for completion. Many IPs require changes in DOE directives, resource planning and scheduling, and coordination with many different sites and offices to solve complex-wide challenges.

Appendix A, Table A.1, *Open Board Recommendations*, lists the six recommendations that remained open at the end of FY16, the date of issuance of each recommendation, and the timeframe that DOE currently projects for completing the associated IP actions. The Board closed one recommendation in FY16. All recommendations (both open and closed), the associated IPs, and a chronological record of related correspondence between DOE and the Board are available on the websites of the DOE Office of the Departmental Representative to the DNFSB (<https://ehss.energy.gov/depref/>) and/or the DNFSB (<http://www.dnfsb.gov/>).

B. Open Recommendations

2015-1: Emergency Preparedness and Response at the Pantex Plant

The Board issued Recommendation 2015-1 on November 24, 2015. The recommendation identifies specific deficiencies with regulatory compliance and emergency preparedness and response capability at Pantex. The Secretary accepted the recommendation on January 13, 2016, and submitted an IP on June 16, 2016. The NNSA Production Office Manager is the Responsible Manager for this recommendation.

The recommendation provided three sub-recommendations to the Secretary for strengthening the Pantex program and ensuring adequate protection of the public health and safety in the event of an operational emergency. The sub-recommendations were:

- (1) Ensure the Pantex Plant drill and exercise programs comprehensively demonstrate proficiency in responding to emergencies for all hazards, all facilities, and all responders, over 5 years;

- (2) Develop and implement processes and demonstrate the capabilities to provide accurate and timely notification to state and local authorities in the event of an off-site release of radioactive material and provide interim radiation monitoring support until state authorities arrive; and
- (3) Evaluate the processes followed during an emergency response to shorten the decision-making timelines for taking protective actions and determine if additional monitoring systems are needed to enhance a timely response.

NNSA submitted deliverables for the IP first quarter milestones on September 15, 2016, and all scheduled commitments were completed. Status reports are provided in the IP on a quarterly basis to the DNFSB until completion.

2014-1: Emergency Preparedness and Response

The Board issued Recommendation 2014-1 on September 3, 2014. The Secretary partially accepted Recommendation 2014-1 on November 7, 2014. On April 24, 2015, DOE transmitted its IP. The IP identified the Department's actions and milestones to improve emergency preparedness and response core capabilities at defense nuclear facilities and addressed all issues identified in Recommendation 2014-1. On July 20, 2016, the Department transmitted Revision 1 of the IP to the Board. This revision incorporated lessons learned from activities completed and a revised schedule for the remaining activities.

While work continued on several deliverables in FY16, the major focus was on completion of DOE Order 151.1D, *Comprehensive Emergency Management Program*. Accomplished with the cooperation of all of the Department's programs, this effort incorporates over 10 years of accumulated changes, updates and clarifications since DOE O151.1C was first issued. The revised order, issued on August 11, 2016, has base-program requirements and risk-informed situational appendices that allow for a user-friendly and consistent, complex-wide, "all-hazards" approach to emergency management program development, implementation and oversight. The implementation of the new Order is ongoing and local assessments will determine the effectiveness of the revisions in addressing the vulnerabilities and improving performance. Completion of this portion of the IP, including a new Criteria Review and Approach Document and Secretarial Direction to implement best practices for corrective actions and performance-based oversight programs is expected by December 1, 2017.

To improve the effectiveness of emergency management oversight and identification of performance issues, the DOE shifted to an approach that links the degree of oversight to the level of risk and performance present at defense nuclear facilities. Work continues on the development and piloting of a management and oversight method to complement the new Order.

2012-2: Hanford Tank Farms Flammable Gas Safety Strategy

The Board issued Recommendation 2012-2 on September 28, 2012. It reflected the Board's belief that current operations at the Hanford Tank Farms require safety-significant active

ventilation of double-shell tanks to ensure the removal of flammable gas from the tanks' headspace. A significant flammable gas accident could have considerable local radiological consequences, endanger personnel, contaminate portions of the Tank Farms, and seriously disrupt the Hanford waste cleanup mission. The Board also recommended that DOE install real-time monitoring systems for tank ventilation flow rates and perform other upgrades on systems used to perform safety-related functions. DOE accepted this recommendation on January 7, 2013, and transmitted its IP to the Board on June 6, 2013.

The Department provided the Board with a revised IP on March 24, 2016, describing a more efficient approach for the deployment of safety significant portable exhausters units for use during off-normal events. The IP also includes completed actions incorporated into the Tank Farms DSA. The margin of safety at the Tank Farms will improve as IP actions are completed. The implementation of safety-significant real-time flow monitoring will be of particular benefit, adding both defense in depth and a simplified control strategy.

The Board responded to the Department via letter on September 16, 2016, concluding that the proposed safety-significant portable exhauster concept was consistent with the Board's recommendation and expressing appreciation for the updated deliverable schedule in the IP. The Department will continue to work with the Board to keep it apprised of ongoing IP efforts for Recommendation 2012-2, currently scheduled for completion in December 2018.

2012-1: Savannah River Site Building 235-F Safety

On May 9, 2012, the Board issued Recommendation 2012-1, and on July 10, 2012, DOE accepted it. The Secretary issued the IP on December 5, 2012. The IP identified multi-year actions to reduce the hazards associated with the material at risk (MAR) that remains as residual contamination in the Plutonium Fuel Form Facility (PuFF) cells 1 through 9. Because of potential dose consequences to collocated workers and the public, DOE's Savannah River Operations Office (DOE-SR) developed a deactivation project plan to guide near-term activities improving the safety posture and long-term activities required to immobilize and/or remove remaining plutonium-238 that remains. The Department recognizes this is the Board's main safety concern.

In November 2014, the Secretary transmitted a summary of schedule changes for the remaining IP actions and deliverables, citing unforeseeable challenges that led to schedule setbacks during FY13 that carried into FY14. The changes reflected modifications to completion dates for the remaining actions and deliverables, but did not change specified actions. The completion date for the IP was extended 29 months to May 31, 2021.

Since the last annual report, DOE-SR has continued to execute actions to mitigate the hazards posed from the MAR. Progress to date includes the electrical and mechanical isolation of PuFF cells 6-9, outer shield window removal on cells 3-9, enhanced characterization in cells 6-9, and initiation of enhanced characterization of cells 3-5. Because of the enhanced characterization in cells 6-9, DOE-SR determined that the MAR present in cells 8 and 9 was insignificant and no

material removal is required. A cracked inner window on the cell maintenance side of cell 6 was discovered, repaired, and an outer window installed to provide additional risk reduction to the work force. Cumulatively, the actions taken to date have significantly improved Building 235-F's safety posture and reduced the likelihood of a full facility fire leading to design basis event consequences. Planning and conducting facility drills each year continues to demonstrate the site's ability to protect workers in all facilities and construction projects around Building 235-F.

DOE-SR continues to look for opportunities to improve schedule performance. By focusing on completing the enhanced characterization of all cells and gloveboxes, the project team will better understand the distribution of the MAR and more effectively plan removal activities.

2011-1: Safety Culture at the Waste Treatment and Immobilization Plant

The Board issued Recommendation 2011-1 on June 9, 2011. This recommendation reflected the Board's assessment that, taken as a whole, the safety culture at the WTP was in need of prompt, major improvement and that corrective actions would be successful and enduring only if championed by the Secretary. The Secretary accepted the recommendation on June 30, 2011, and DOE transmitted its IP on December 27, 2011. On September 14, 2012, DOE delivered an IP addendum, based on information and experience accumulated during execution of the original IP. DOE sent a revised IP schedule on September 27, 2013.

Consistent with the letter to the Board dated December 19, 2014, DOE is revising contract language to include the DOE Integrated Safety Management (ISM) requirements. The inclusion of this contract language emphasizes the Department's expectations for balancing priorities, which includes establishing the desired ISM environment (e.g., a positive safety culture and a safety conscience work environment).

The Office of River Protection (ORP) safety culture sustainment plan, updated in September 2015, identified improvement actions related to organizational culture, safety culture, and SCWE with emphasis on the areas of leadership, employee engagement, and organizational learning. Highlights included: (1) strengthening Federal oversight processes (BNI's management improvement plan, contract incentives); (2) completing self-assessments addressing internal assessment and safety culture self-assessment; (3) clarifying employee expectations; and (4) conducting internal self-assessments against established performance metrics/measurements (e.g., Federal employee viewpoint survey analysis for organizational culture, questioning attitude metrics). ORP provided safety culture refresher training to its Federal and contractor staff in March 2016.

EM continues its commitment to improving safety culture across the EM Complex. Because of EM's recommendations identified in its April 2015 safety culture sustainment plan review report, all Federal and EM contractor organizations will be required to perform safety culture self-assessments as part of their ISM periodic declaration, starting in FY17. Following the completion of self-assessments, each organization is expected to revise its safety culture

sustainment plan to address identified areas of improvement for safety culture and SCWE consistent with prior guidance (as issued by the Assistant Secretary for Environmental Management).

2009-2: Los Alamos National Laboratory Plutonium Facility Seismic Safety

The seismic risk posed by an earthquake at PF-4 is one of the Board's highest priority safety concerns. The Board issued Recommendation 2009-2 on October 26, 2009, advising the Department to implement both immediate and long-term actions to reduce the consequences of potential seismic events at PF-4. The Secretary accepted the recommendation on February 2, 2010, and transmitted the IP on July 13, 2010.

The Department has taken significant actions to develop and implement an acceptable safety strategy for seismically induced events. DOE conducted extensive technical seismic analyses, facility modifications, structural upgrades, removal of hazards and nuclear materials from the facility and began a campaign to package existing nuclear materials into more robust certified containers. All of these actions make the facility safer in the event of a large earthquake. These actions were prudent, given the potential exposure consequences to the public, and provided definitive and measurable facility safety improvements. DOE has completed all IP actions, with the exception of providing an updated project execution plan for the seismic-related structural system, and component upgrades.

In May 2016, the Board sent a letter to NNSA indicating that the fire suppression system in PF-4 cannot be credited as a seismically qualified safety class control for post seismic fires without further analysis, significant system modifications, or potential replacement. NNSA agreed with the Board's conclusion, which resulted in NNSA certifying the existing material at risk limits, as well as other controls. These will provide reasonable assurance of adequate protection to the worker, the public, and the environment. Corrective actions will involve a testing and analysis program with potential facility upgrades.

Because the Department and the Board cannot reach consensus on whether existing seismic analyses results provide reasonable assurance that the facility can withstand a design basis earthquake, steps for an additional dynamic non-linear analysis are underway. LANL and NNSA established a working group to develop a RFP to obtain a state-of-the-art seismic performance analysis of the upgraded PF-4 configuration. The next analysis will build upon prior analyses and further improve the understanding of and confidence in, PF-4's long-term seismic performance. Both the fire suppression system issues and the seismic analysis will require additional time and planning to complete.

C. Closed Recommendations

2010-1: Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers

The Board issued Recommendation 2010-1, *Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers* on October 29, 2010. The recommendation advised

DOE to amend 10 Code of Federal Regulations (C.F.R.) Part 830, *Nuclear Safety Management*, to require methods in DOE Standard (STD) 3009-1994, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*. Additionally, the Board recommended DOE revise DOE-STD-3009-1994, to clarify criteria for hazard and accident analysis methodologies and the identification of hazard controls. The Board also recommended a clearly defined approval authority for safety analyses at defense nuclear facilities that exceeds the established Evaluation Guideline. The Secretary partially accepted the recommendation on February 28, 2011, and DOE transmitted its IP on September 26, 2011. DOE sent a revised IP schedule to the Board on September 20, 2013.

Following the revision and issuance of DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, in FY15, DOE's activities relating to this Recommendation in FY16 focused on updating the following Standards to be consistent with DOE-STD-3009-2014: (1) DOE-STD-3011, *Guidance for Preparation of Basis for Interim Operation (BIO) Documents*; (2) DOE-STD-1120, *Integration of Environment, Safety and Health into Facility Disposition Activities*; and (3) DOE-STD-1189, *Integration of Safety into the Design Process*.

On September 23, 2016, the Board closed Recommendation 2010-1 noting that DOE has revised key nuclear safety directives, including DOE Standard 3009-2014, and DOE Standard 1104-2014, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*. The Board also stated that these updated standards contain significantly improved requirements clarifying DOE's expectations for ensuring adequate protection at DOE defense nuclear facilities.

V. Interface Activities

In addition to formal recommendations, the Board and its staff regularly communicate with DOE through correspondence, participate in site visits at the Department's defense nuclear facilities to review the implementation of safety programs and initiatives, assessments of defense nuclear facilities and their respective operations, and briefings. Information about DNFSB interactions with DOE, including all related correspondence, is available on the Departmental Representative website at <https://ehss.energy.gov/deprep/> and categorized by FY and Departmental sites.

In addition to completing IP actions, DOE responds to the Board's issuance of formal letters, which establish reporting requirements pursuant to 42 U.S.C. Section 2286b(d). During FY16, DOE completed actions in compliance with the reporting requirements listed in Appendix A, Table A.2. In addition, DOE and NNSA participated in the DNFSB public hearing held on March 22, 2016 in Santa Fe, NM, as summarized in Appendix A, Table A.3. Table A.2 in Appendix A lists the DOE reports completed in FY16.

Appendix A. FY16 Summary: Open Recommendations, Statutory Letter Reports and Public Meetings/Hearings

Table A.1 Open Recommendations

Rec #	Title	Date Opened	Projected Timeframe for Completing Implementation Plan Actions
2015-1	Emergency Preparedness and Response at the Pantex Plant	11/24/2015	2018
2014-1	Emergency Preparedness and Response	09/03/2014	2017
2012-2	Hanford Tank Farms Flammable Gas Safety Strategy	09/28/2012	2018
2012-1	SRS Building 235-F Safety	05/09/2012	2021
2011-1	Safety Culture at the WTP	06/09/2011	One IP commitment is pending
2009-2	LANL Plutonium Facility Seismic Safety	10/26/2009	One IP commitment is pending

Table A.2 DOE Reports Required by DNFSB Letters - Completed In 2016

Date Completed	Reporting Requirements	Date of Board Letter
11/18/2015	A report describing DOE's position on controlling river access and protecting public receptors from accidents during slurry transfers, and the technical basis for this position, for the Sludge Treatment Project at Hanford.	8/21/2015
12/15/2015	A report on the technical basis for the planned risk analysis approach to Update the Idaho National Laboratory's Probabilistic Seismic Hazard Analysis.	8/31/2015
12/16/2015	A report addressing the safety basis issues at the Defense Waste Processing Facility (DWPF) at SRS, specifically: DOE's analysis of interactions between non-safety and safety components in the melter off-gas system; the adequacy of compensatory measures for the retained hydrogen Potential Inadequacy of Safety Analysis (PISA); and the path forward for resolving the melter feed rate, retained hydrogen and antifoam flammability PISAs.	8/3/2015
12/22/2015	A report documenting the scope and schedule for Building 235-F decontamination activities in Fiscal Years 2016 and 2017, to support the Implementation Plan for Recommendation 2012-1, <i>Savannah River Site Building 235-F Safety</i> .	11/10/2015
2/25/2016	A schedule to conduct specific analyses of the structures, systems, and components needed to confine and control hazardous material for the Electrorefining Project at Y-12.	10/29/2015
4/19/2016	Annual report and briefing on the Department's nuclear criticality safety program.	2/26/2016
4/21/2016	A report and briefing on the safety strategy for upgrading the double-shell tank ventilation systems.	12/5/2014
8/16/2016	A report detailing progress DOE has made in response to the Board's Recommendation 2014-1, <i>Emergency Preparedness and Response</i> .	6/3/2016
8/29/2016	A written assessment of the LANL Plutonium Facility's Fire Suppression System vulnerabilities and their impact on the facility's current and planned safety posture.	5/12/2016

Table A.3 DNFSB Public Meetings/Hearings Conducted

Date	Topic	Location	Discussion Areas
3/22/16	DOE's actions taken or planned to resolve known inadequacies in the current safety basis of the various facilities that manage or store TRU waste at LANL, and actions to improve TRU waste management response to the challenges caused by the WIPP accident and the associated investigation findings.	Santa Fe Community Convention Center Santa Fe, NM	Meeting to obtain information regarding the hazards to the public and workers posed by the management of transuranic waste at Los Alamos National Laboratory and the Department's plans to address those hazards.

Appendix B. Acronyms and Abbreviations

AIB	Accident Investigation Board
Board	Defense Nuclear Facilities Safety Board
CNS	Chief of Nuclear Safety
CSO	Cognizant Secretarial Officer
Department	U.S. Department of Energy
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DOE-SR	DOE Savannah River Operations Office
DSA	Documented Safety Analysis
EM	Office of Environmental Management
FDS	Flame Detection Systems
FY	Fiscal Year
Hanford	Hanford Site
HPFL	High-Pressure Fire Loop
HQ	Headquarters
IP	Implementation Plan
ISM	Integrated Safety Management
IVS	Interim Ventilation System
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
MAR	Material at Risk
NNSA	National Nuclear Security Administration
NTP	National TRU Program
ORP	Office of River Protection
PF-4	LANL Plutonium Facility
PISA	Potential Inadequacy of the Safety Analysis
PuFF	Plutonium Fuel Form Facility
RFP	Request for Proposal
RNS	Remediated Nitrate Salt
SCWE	Safety conscious work environment
Secretary	Secretary of Energy
SER	Safety Evaluation Report
TRU	Transuranic
TWF	Transuranic Waste Facility
WAC	Waste Acceptance Criteria
WCRRF	Waste Characterization, Reduction, and Packaging Facility
WIPP	Waste Isolation Pilot Plant
WTP	Waste Treatment and Immobilization Plant