Los Alamos National Laboratory
Accident Investigation Board
Corrective Action Plan Update
to
Northern New Mexico Citizens Advisory Board
Combined Committee Meeting

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ENVIRONMENTAL MANAGEMENT
SAFETY ❖ PERFORMANCE ❖ CLEANUP ❖ CLOSURE

Accident Investigation Board Reports

- **Phase 1 Report Issued on April 22, 2014: "*Radiological Release Event at the Waste Isolation Pilot Plant on February 14*, 2014"**
  - Discusses how the radiological material was released into the atmosphere
- **Phase 2 Report Issued April 16, 2015: "*Radiological Release Event at the Waste Isolation Pilot Plant*, February 14, 2014"**
  - Direct cause: exothermic reaction of incompatible materials in Los Alamos National Laboratory (LANL) waste drum
  - Local root cause: failure of Los Alamos National Security (LANS) to understand and effectively implement the LANL Hazardous Waste Facility Permit and Carlsbad Field Office (CBFO) directed controls
  - Systemic root cause: failure of National Nuclear Security Administration Los Alamos Field Office (NA-LA) and National Transuranic Program/CBFO to ensure that LANS had adequately developed and implemented repackaging and treatment procedures
  - Contributing causes: Shortcomings found within both contractor and federal processes at the Los Alamos National Laboratory, WIPP, EM, and the National Nuclear Security Administration.
- **Phase 2 Included 24 Conclusions and 40 Judgments of Need (JONs)**
  - 22 JONs are related or directed to LANL
    - 5 JONs directed to DOE LANL
    - 16 JONs directed to LANS
    - 1 JON directed to both

Technical Assessment Team (TAT) Report

❑ TAT Report Issued on March 17, 2015

- To complement the AIB investigations, the DOE created an independent TAT to determine the mechanisms and chemical reactions that may have contributed to the failure of the waste drum
- The TAT concluded that one drum, Drum 68660, was the source of the radiological release
- The contents of Drum 68660 were chemically incompatible, and the drum breached as a result of internal chemical reactions

❑ TAT Overarching Conclusion:

- Chemically incompatible contents of Drum 68660 from LANL in combination with physical conditions (e.g., the configuration of the materials in the drum) supported exothermic chemical reactions leading to a thermal runaway
- The consequent build-up of gases within the drum displaced the drum lid, venting radioactive materials and hot matter that further reacted with air or other materials outside the drum to cause the secondary damage observed in WIPP P7R7

[NOTE: Inspector General Report (0922) dated September 2014, mirrored similar concerns as TAT and the AIB]

Corrective Action Plan (CAP) Development

❑ Overall DOE CAP

- DOE (EM Headquarters, EM-LA, & NA-LA) and contractors (Nuclear Waste Partnership & Los Alamos National Security) established a set of integrated CAPs
- Accomplished by EM-HQ and CBFO lead Technical and Management Team to develop a set of integrated corrective actions as a point of departure

❑ DOE LANL CAPs (EM-LA & NA-LA)

- Established Senior Management Team to develop corrective actions
- Senior DOE EM and NNSA Management actively engaged in the development and review of the corrective actions
- Coordinated and integrated across EM-HQ, NNSA-HQ, CBFO, EM-LA and NA-LA and Field Office Contractors
- Final DOE LANL CAP submitted to DOE-EM on September 15, 2015 and Approved on November 3, 2015

CAP Management Approach

- **DOE LANL CAPs**
  - CAP Managers identified and assigned
  - Integrated schedule developed to track status and actions
  - CAPs under configuration control
    - EM-LA Field Office Manager and EM-40 Deputy Assistant Secretary approve changes to the EM-LA CAP
    - NA-LA Field Office Manager approves changes to NA-LA CAP
    - Weekly and monthly status meetings established
    - Independent Teams verify that corrective actions have been completed and implemented

Types of Corrective Actions

Addressing Systematic Issues	**JON 14:** Process Engineering/Change Control **JON 32:** Procedure Development **JON 39:** Safety Culture
Improving Requirements Definition	**JON 9, 10:** RCRA Requirements **JON 13, 18:** Remediated Nitrate Salt Technical Basis **JON 19, 20, 21:** Safety Basis
Implementing Improvements	**JON 15, 16, 17:** WCRRF Glovebox Procedure **JON 38:** Training and Qualification **JON 38:** Safety Basis
Ensuring Compliance and Improving Oversight	**JON 22, 23, 24:** Unreviewed Safety Question Process **JON 38, 39:** Contractor Assurance System and Quality Assurance **JON 38:** Safety Basis **JON 3, 26, 27, 29:** Oversight

Numbers in red are JONS that are assigned to EM-LA and NA-LA. Numbers in black are JONS assigned to LANS.

JON 3: Ensuring Compliance and Improving Oversight

- **Conclusion 3:** The NA-LA oversight activities were ineffective in identifying weaknesses in the execution of waste packaging, characterization and certification of TRU waste at LANL.
- **JON 3:** NA-LA oversight of characterization and certification of TRU waste sites needs to be improved to include:
  - Waste Characterization, Reduction, and Repackaging Facility (WCRRF) repackaging operations that prepare TRU waste for characterization;
  - Implementation of waste generator site processes as they relate to TRU waste management; and,
  - Verification that waste generator activities comply with the generator site Resource Conservation and Recovery Act (RCRA) permit.
- **Approach:** Enhance and implement a rigorous DOE oversight program of contractor activities

JON 24: Ensuring Compliance and Improving Oversight

- **Conclusion 15:** The Los Alamos National Security, LLC (LANS) Unreviewed Safety Question (USQ) process was ineffective in ensuring that important procedure changes related to processing of nitrate salts were adequately evaluated for impacts to the safety basis.

- **JON 24:** The NA-LA needs to conduct an assessment of the LANS USQ program.

- **Approach:** With assistance of EM-LA, NA-LA to conduct independent assessment of the LANS USQ process related to waste operations for legacy waste program and the enduring waste program. Performance of oversight and assessments of the LANS USQ process will be structured to verify adequacy of implementation and effectiveness of USQ reviews for the legacy waste program and the enduring waste program.

JON 26: Engineering Change Control Process (ADEP)

- **Conclusion 17:** The NA-LA oversight was ineffective in identifying weaknesses that contributed to this event.
- **JON 26:** NA-LA needs to strengthen its oversight of LANS Environmental and Waste Management Operations to ensure that:
  - *Resource Conservation and Recovery Act(RCRA) oversight is performed;*
  - *Focus is placed on operational oversight in addition to budget/financial oversight;*
  - *On the ground operational oversight expands beyond that performed by the Facility Representatives to include adequate subject matter expertise;*
  - *NA-LA performs oversight of contractor activities related to waste certification in accordance with the WIPP Waste Acceptance Criteria (WAC);*
  - *Roles and responsibilities for oversight of Waste Characterization, Reduction, and Repackaging Facility (WCRRF) operations are made clear;*
  - *Staffing shortages are addressed, including:*
- **Approach:** Same as JON 3 Approach.

JON 27: Ensuring Compliance and Improving Oversight

- **<u>Conclusion 17:</u>** *The NNSA Los Alamos Field Office (NA-LA) oversight was ineffective in identifying weaknesses that contributed to this event.*

- **<u>JON 27</u>:** *NA-LA needs to verify that LANS has developed and implemented a DOE O 226.1B, Implementation of Department of Energy Oversight Policy compliant Contractor Assurance System (CAS).*

- **<u>Approach</u>:** The EM-LA and NA-LA Field Office Managers will evaluate the LANS Environment and Waste Management Organization (NNHO-EWMO) programs and management systems, including site assurance systems, for effectiveness of performance (including compliance with requirements). Such evaluations will be based on the results of operational awareness activities; assessments of facilities, operations, and programs; and assessments of the contractor's assurance system.

  The EM-LA and NA-LA Field Office Managers will develop or revise assessment plans and schedules for planned assessments, focus areas for operational oversight, and reviews of the contractor's self-assessment of processes and systems for legacy waste program and the enduring waste program. Planned assessments will be identified and scheduled as part of the each Field Offices annual *Integrated Assessment* Plan and will be coordinated with planned contractor assessments.

JON 29: Ensuring Compliance and Improving Oversight

- **<u>Conclusion 18:</u>** The Federal roles, responsibilities and execution for oversight of the activities between the generator site transuranic (TRU) waste program (LANL) and the TRU Waste Central Characterization Program (CCP) were inadequate.

- **<u>JON 29</u>:** NA-LA and CBFO needs to perform effective Federal oversight of CCP review and approval of waste management operating procedures/process changes, e.g., WCRRF glovebox operating procedure.

- **<u>Approach</u>:** The Memorandum of Agreement (MOA) between NA-LA, EM-LA, and CBFO will be revised to officially clearly define and agree on R2A2s for the strategy to mutually support the safe and compliant characterization and disposition of legacy and newly generated transuranic waste at LANL. This will include defining the methods for performing effective oversight of CCP and LANL operations, including review of documentation (e.g. procedures, plans).

JON 39: Addressing Systematic Issues

- **Conclusion 23:** LANS, Energy Solutions, LLC (ES) and NA-LA allowed the safety culture at LANL to deteriorate within pockets of the organization as evidenced by the workers' feedback that they did not feel comfortable identifying issues that may adversely affect management direction, delay mission-related objectives, or otherwise affect cost or schedule. In addition, management failed to effectively respond to workers' issues regarding unexpected conditions, i.e., generation of smoke and foaming, encountered during waste processing activities.

- **JON 39:** LANS and NA-LA need to develop and implement a more rigorous, effective integrated safety management system that embraces and implements the attributes of DOE G 450.4-1C, Integrated Safety Management Guide, including but not limited to:
  - Demonstrated leadership in risk-informed, conservative decision making;
  - Improved learning through error reporting and effective resolution of problems;
  - Line management encouraging a questioning attitude without fear of reprisal and following through to resolve issues identified by the workforce.
  - Consideration should also be given to some additional contract incentive associated with leading a culture change that fosters the desired work environment. The LANS, ES, and NA-LA stop work related processes need to ensure that response to issues raised by workers are based on sound, technical justification.

- **Approach:** The EM-LA and NA-LA Field Office Managers will improve the effectiveness of the Integrated Safety Management System by addressing the importance of establishing and maintaining a safety culture, including addressing questioning attitude, demonstrated leadership in risk-informed decision making, reporting and effective resolution of problems, and improvement in nuclear safety cultural attributes embracing the Safety Culture Focus Areas in DOE G 450.4-1C, Integrated Safety Management Guide.

CAP Implementation

- **CAP End-State**
  - Documented roles, responsibilities, accountabilities and authorities between EM-LA, NA-LA and CBFO
  - Formalized process for conducting contractor oversight
  - Qualified staff with experience commensurate with responsibilities
  - Training/qualification in place for oversight positions
  - Safety culture embraced by managers and employees
  - Improved operational envelope (i.e.: nuclear safety, RCRA and waste management programs)

Summary

- WIPP is integral and critical to DOE missions
- Field Managers are Engaged and Committed to Improving LANL Oversight
- Collaboration and Integration of DOE Waste Operations has never been stronger within New Mexico

- Questions?