



**Department of Energy**  
**Under Secretary for Nuclear Security**  
**Administrator, National Nuclear Security Administration**  
**Washington, DC 20585**



November 17, 2015

VIA OVERNIGHT UPS MAIL CARRIER

Ms. Jill M. Hruby  
President and Laboratories Director  
Sandia Corporation  
Sandia National Laboratories  
P.O. Box 5800, MS 0101  
Albuquerque, New Mexico 87185-0101

WEA-2015-06

Dear Ms. Hruby:

This letter conveys the enclosed Preliminary Notice of Violation (PNOV) issued by the National Nuclear Security Administration (NNSA) regarding the implementation of the Sandia Corporation (Sandia) worker safety and health program (WSHP) at Sandia National Laboratories (SNL). The U.S. Department of Energy (DOE) conducted an investigation of these WSHP deficiencies as revealed by a lithium ion (Li-Ion) battery fire in building 905 and an unexpected detonator initiation at explosives testing site 9920, and provided the results of the investigation to Sandia in an investigation report dated December 11, 2014. An enforcement conference was convened on January 27, 2015, with you and members of your staff to discuss the report's findings and Sandia's response. An enforcement conference summary and list of attendees is enclosed.

NNSA considers the deficiencies in worker safety and health program implementation to be of high safety significance as evidenced by the conditions associated with the events. Sandia did not adequately identify, assess, and abate workplace hazards, as well as respond to emergency conditions resulting from these events in accordance with DOE requirements in 10 C.F.R. Part 851, *Worker Safety and Health Program*. DOE's investigation determined that the building 905 Li-Ion battery fire was a near miss to serious injury or fatality in that during the emergency response, Sandia exposed personnel to fire combustion products; these included two workers who were sent, with no protection, back into the smoke-filled building penthouse. The site 9920 unexpected detonator initiation



caused a serious hand injury and was a near miss to serious injury or fatality because only a short time earlier, the impacted worker had handled the same detonator while it was imbedded in a one-pound block of C4 explosive.

Based on an evaluation of the evidence in this matter, including information that Sandia presented at the enforcement conference, NNSA concludes that Sandia violated requirements of Part 851. Accordingly, NNSA hereby issues the enclosed PNOV, which identifies four Severity Level I violations and two Severity Level II violations of Part 851 requirements for management responsibilities, hazard identification and assessment, hazard prevention and abatement, emergency response, training and information, and recordkeeping and reporting. Four of the violations cited in this PNOV represent deficiencies of a continuing nature in Part 851 implementation, in that they are similar to deficiencies that NNSA cited Sandia for in previous enforcement actions; for example, the premature ignition of a rocket motor at the Sandia Technical Area III sled track in 2008, and the lithium-helium heat exchange fire and explosion in building 6530 in 2011.

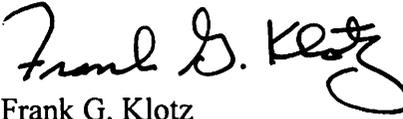
In accordance with 10 C.F.R. § 851.5(b) and Department of Energy Acquisition Regulation 48 C.F.R. § 970.5215-3, Conditional Payment of Fee Clause, (Part II, *Contract Clauses*, Section (i), Clause 75) under contract number DE-AC04-94AL85000 between NNSA and Sandia, NNSA administered a contract fee reduction in the amount of \$686,000 for work planning and control deficiencies, which are similar to the worker safety and health program implementation violations identified during DOE's investigation and the subject of this PNOV. Sandia participated in an accident investigation with NNSA into the unexpected detonator initiation event. The joint investigation noted several similarities to previous incidents at SNL and that Sandia's previous corrective actions had not been effective in preventing recurrence. NNSA acknowledges Sandia's corrective actions that are designed to address the causal factors associated with this event. Pursuant to 10 C.F.R. § 851.5(c), NNSA proposes no civil penalty for the violations. In addition, NNSA directs Sandia to evaluate and fully abate the worker safety and health deficiencies associated with the building 905 event, including the documented fire code deficiencies.

Pursuant to 10 C.F.R. § 851.42, *Preliminary Notice of Violation*, you are obligated to submit a written reply within 30 calendar days of receipt of the enclosed PNOV and to follow the instructions specified in the PNOV when preparing your response. If you do not submit a reply within 30 calendar days, then in accordance with 10 C.F.R. § 851.42(d), you relinquish any right to appeal any matter in the PNOV, and the PNOV, will constitute a final order.

After reviewing your reply to the PNOV, including any proposed additional corrective actions entered into DOE's Noncompliance Tracking System, NNSA will determine whether any further activity is necessary to ensure compliance

with DOE worker safety and health requirements. NNSA will continue to monitor the completion of corrective actions until this matter is fully resolved.

Sincerely,

A handwritten signature in black ink, appearing to read "Frank G. Klotz". The signature is stylized with a large, looping "K" and a long, sweeping underline.

Frank G. Klotz

Enclosures: Preliminary Notice of Violation (WEA-2015-06)  
Enforcement Conference Summary and List of Attendees

cc: Jeffrey Harrell, NA-SN  
Gabriel King, SNL

**Preliminary Notice of Violation**

Sandia Corporation  
Sandia National Laboratories  
Albuquerque, New Mexico

WEA-2015-06

A U.S. Department of Energy (DOE) investigation into the facts and circumstances associated with deficiencies in the implementation of the Sandia Corporation (Sandia) worker safety and health program (WSHP) at Sandia National Laboratories (SNL) revealed multiple violations of DOE worker safety and health requirements by Sandia. DOE evaluated Sandia's WSHP implementation effectiveness as evidenced by two events: a lithium ion (Li-Ion) battery fire in building 905 on October 26, 2012, and an unexpected detonator initiation at explosives testing site 9920 on December 11, 2013. DOE provided Sandia with an investigation report dated December 11, 2014, and convened an enforcement conference with Sandia representatives on January 27, 2015, to discuss the report's findings and Sandia's response.

Pursuant to Section 234C of the Atomic Energy Act of 1954, as amended, and DOE regulations set forth at 10 C.F.R. Part 851 (Part 851), *Worker Safety and Health Program*, the National Nuclear Security Administration (NNSA) hereby issues this Preliminary Notice of Violation (PNOV) to Sandia. The violations included deficiencies in: (1) management responsibilities, (2) hazard identification and assessment, (3) hazard prevention and abatement, (4) emergency response, (5) training and information, and (6) recordkeeping and reporting. NNSA has grouped and categorized four Severity Level I violations and two Severity Level II violations.

Severity Levels are explained in Part 851, Appendix B, *General Statement of Enforcement Policy*. Section VI(b)(1) states that “[a] Severity Level I violation is a serious violation. A serious violation shall be deemed to exist in a place of employment if there is a potential that death or serious physical harm could result from a condition which exists, or from one or more practices, means, methods, operations, or processes which have been adopted or are in use, in such place of employment.”

Section VI(b)(2) states that “[a] Severity Level II violation is an other-than-serious violation. An other-than-serious violation occurs where the most serious injury or illness that would potentially result from a hazardous condition cannot reasonably be predicted to cause death or serious physical harm to employees but does have a direct relationship to their safety and health.”

In accordance with 10 C.F.R. § 851.5(b) and Department of Energy Acquisition Regulation 48 C.F.R. § 970.5215-3, Conditional Payment of Fee Clause, (Part II, *Contract Clauses*, Section (i), Clause 75) under contract number DE-AC04-94AL85000 between NNSA and Sandia, NNSA withheld fee in the amount of \$686,000 for work planning and control deficiencies, which are similar to the worker safety and health program implementation violations identified during

DOE's investigation and subject to this PNOV. As a result, and pursuant to 10 C.F.R. § 851.5(c), NNSA proposes no civil penalty for the violations cited in this PNOV.

As required by 10 C.F.R. § 851.42(b) and consistent with Part 851, Appendix B, the violations are listed below. If this PNOV becomes a final order, then Sandia may be required to post a copy of this PNOV in accordance with 10 C.F.R. § 851.42(e).

## I. VIOLATIONS

### A. Management Responsibilities

Title 10 C.F.R. § 851.10, *General requirements*, subsection (a), states that “[w]ith respect to a covered workplace for which a contractor is responsible, the contractor must: . . . (2) [e]nsure that work is performed in accordance with: (i) [a]ll applicable requirements of [10 C.F.R. Part 851]; and (ii) [w]ith the worker safety and health program for that workplace.”

Title 10 C.F.R. § 851.20, *Management Responsibilities and Worker Rights and Responsibilities*, subsection (a) states that “[c]ontractors are responsible for the safety and health of their workforce and must ensure that contractor management at a covered workplace: . . . (3) [a]ssign worker safety and health program responsibilities, evaluate personnel performance, and hold personnel accountable for worker safety and health performance.”

Title 10 C.F.R. § 851.24, *Functional Areas*, subsection (b) states that “(i)n implementing the structured approach required by paragraph (a) of this section, contractors must comply with the applicable standards and provisions in Appendix A of this part, entitled ‘Worker Safety and Health Functional Areas.’”

Title 10 C.F.R. § 851, Appendix A.2, *Fire Protection*, subsection (b) states that “[a]n acceptable fire protection program must include those fire protection criteria and procedures, analyses, hardware and systems, apparatus and equipment, and personnel that would comprehensively ensure that the objective in paragraph 2(a) of this section is met. This includes meeting applicable building codes and National Fire Protection Association codes and standards.”

Sandia document PG470246, *10 CFR 851 Worker Safety and Health Program Plan (WSHPP)*, May 2012, revision 5.0, Attachment 4, *10 CFR 851 Implementation Matrix*, requires compliance with ESH100.1GP.2, *Implement ESH General Requirements*. At the time of the events, the activities in both building 905 and site 9920 were covered by PG470246.

Sandia document ESH100.1GP.2, October 21, 2009, revised October 11, 2013, *Requirements Tables*, requires that “[m]embers of the workforce, including managers . . . [f]ollow the requirements detailed in *GN470108, ES&H [Environment, Safety, and Health] General Requirements*.”

Sandia document GN470108, October 26, 2009, *Procedure Requirements, ES&H Responsibilities, Procedure Requirements, R2A2* [Roles/Responsibilities/ Authorities/Accountabilities] *Required Actions* state for the following personnel:

- *Researchers and Principal Investigators*: “Plan experiments and perform them, or ensure their performance, within established controls, [and] ES&H requirements . . .” and “[p]erform safety checks.”
- *Person in Charge (PIC)*: “Provide effective supervision, as necessary, to ensure the protection of worker safety and health,” “[c]onduct pre-job briefings to an extent appropriate for the complexity of and hazards associated with the work,” “[t]ake appropriate actions if unexpected hazards or conditions are encountered,” and “[r]eview and obtain approval for the JSA [job safety analysis] based upon completeness and adequacy.”
- *Project and Program Managers*: “Ensure that project work is planned and budgets requested so that hazards are identified and mitigated appropriately, considering business needs as well as health and safety risks,” “[e]nsure that all appropriate roles and responsibilities, authorities, and accountabilities are identified, promulgated, and communicated to the personnel in their project, including any overlapping roles and responsibilities,” and “[c]onsider potential hazards at a high level in planning how work will be done, what materials will be used, and ways to avoid exposing personnel to hazards where possible (by substituting chemicals, rearranging job responsibilities, etc.).”

Sandia document *Environment, Safety and Health Facility Specific Operating Procedure FSOP-EFS-001, Explosives Applications and Containment Training Facility (Site 9920) Operations*, July 19, 2013, Section 1.1 *Purpose*, states: “[t]his Environment Safety and Health (ES&H) operating procedure provides the necessary guidelines and requirements for SNL’s Integrated Military Systems Development Center members of the work force (MOWs) to perform the following activities at SNL’s site 9920 . . . [a]rming and firing (A&F) explosives and explosive components, access control, explosives handling, and assembly and disassembly.” Section 4.3, *Job Classifications for Site 9920 Operators*, subsection 4.3.4, *A&F Officer (performs the duties of Explosives Operator/Site Safety Officer)*, states that this individual “[h]as the authority for local decisions regarding test execution.” Subsection 4.3.10, *Control Officer*, identifies this individual as “[a] [s]ite operator assigned responsibility for assisting the A&F Officer with checklists, notifications, and general test execution logistics.” Section 5, *Perform Work*, subsection 5.4.4, *A&F for Explosives Operations and/or Flash Radiography*, states that “[t]he Firing Officer is responsible for ensuring compliance with the provisions of this section” and “[b]efore any hazardous test activities, the following items shall be completed . . . [u]se the A&F Checklist in Appendix C for these operations.”

Contrary to the above requirements, Sandia has failed to ensure that work was performed in accordance with 10 C.F.R. Part 851 and its WSHPP in that Sandia did not adequately assign WSHPP responsibilities and hold personnel accountable for performance. In addition, Sandia has

failed to implement applicable facility fire protection program requirements. Specific examples include the following:

1. Sandia did not ensure that the organizations managing the project and using site 9920 during development and testing of an explosive device adequately implemented the ES&H R2A2 identified in GN470108 for PICs and for project and program managers. Personnel assigned to these positions did not plan experiments within ES&H requirements, perform safety checks, provide effective supervision to ensure protection of worker safety and health, conduct pre-job briefings to an appropriate extent, take appropriate actions when unexpected conditions were encountered, plan work so that hazards were identified and mitigated appropriately, or identify and communicate roles and responsibilities.
2. Sandia did not clearly define and assign roles and responsibilities or ensure checklist completion for the December 11, 2013, test of a device at site 9920 in accordance with FSOP-EFS-001. Personnel interviews revealed conflicting views of who held the position of safety officer during the test. Additionally, Sandia did not prepare and ensure completion of an A&F checklist for the December test to identify critical steps for safely performing the work.
3. Prior to performing work, Sandia did not ensure building 905 complied with international building and fire code requirements as detailed in its *Prescriptive Code Analysis and Performance-Based Evaluation, Building 905, Laboratory 1105*, dated February 24, 2014, nor submit a request for an exemption, equivalency, or record of code decision to the Sandia Field Office.

Collectively, these noncompliances constitute a recurring Severity Level I violation. (Ref. WEA-2014-04 and WEA-2010-03)

## **B. Hazard Identification and Assessment**

Title 10 C.F.R. § 851.21, *Hazard identification and assessment*, subsection (a) states: “[c]ontractors must establish procedures to identify and assess existing and potential workplace hazards and assess the risk of associated workers injury and illness” and “[p]rocedures must include methods to: (1) assess worker exposure to chemical, physical, biological, or safety workplace hazards through appropriate workplace monitoring . . . (4) [a]nalyze designs of new facilities and modifications to existing facilities and equipment for potential workplace hazards . . . (5) [e]valuate operations, procedures, and facilities to identify workplace hazards . . . (6) [p]erform routine job activity-level hazard analysis [HA] . . . and (8) [c]onsider interactions between workplace hazards and other hazards such as radiological hazards.” Subsection (c) states “[c]ontractors must perform the activities identified in paragraph (a) of this section, initially to obtain baseline information and as often thereafter as necessary to ensure compliance with the requirements in this Subpart.”

Title 10 C.F.R. Part 851, Appendix A6, *Industrial Hygiene*, states that “[c]ontractors must implement a comprehensive industrial hygiene program that includes at least the following

elements: (a) [i]nitial or baseline surveys and periodic resurveys and/or exposure monitoring as appropriate of all work areas or operations to identify and evaluate potential worker health risks.”

Document PG470246, Paragraph 8.4.1, *Hazard Identification Assessment*, states that “[t]he following documents define the requirements for documented hazard identification and assessment for existing and potential workplace hazards . . . ESH100.1.WPC.1, *Plan and Control Work*, which requires compliance with the MN471018, *Work Planning and Control [WP&C] Manual*” and “ESH100.2.SB.1, *Establish the Safety Basis of Operations*, which requires compliance with the MN471017, *Safety Basis Manual*.”

Document PG470246, Section 2, *Introduction*, states that “Sandia has a Safety and Health Program (SHP) structured according to the SNL Integrated Safety Management System (ISMS). Identification and implementation of SHP process requirements contained in the SNL Corporate Policy System occurs by the structure defined by the SNL PG470252, *Integrated Safety Management System (ISMS) Description*, and the MN471018, *Work Planning and Control Manual*, which is required by ES&H Corporate Procedure ESH100.1.WPC.1, *Plan and Control Work*.”

Document PG470246, Section 8.1.3, *Accountability*, states that “[m]anagement and non-management roles, responsibilities, authorities, and accountabilities relative to implementing the SNL ISMS and SHP, and compliance with safety and health requirements are provided by . . . [c]orporate [p]rocedures such as ESH100.2.IH.1, *Maintain a Workplace Free from Chemical, Physical, Biological, and Safety Workplace Hazards*.” Attachment 1, *Functional Areas*, Section 1.3, *Explosives Safety, SNL compliance documents*, identifies “ESH100.2.EXP.1, *Manage Explosives Safety*, which requires compliance with MN471011, *Explosives Safety Manual*.”

Sandia document MN471011, Section 2-1.7, *Process Hazard Analysis*, subsection a, states that “[b]efore beginning any explosives synthesis, formulation, manufacturing, testing, or disposal operation, a process HA shall be performed. A single process HA may be performed for similar processes performed in a single facility provided that the ‘worst-case’ process is the basis for the HA.” Sandia documented its Site 9920 process HA in FMEA-97649226, *Failure Modes and Effects Analysis [FMEA] for Explosive Firing Site 9920*.

Sandia document MN471017, *Safety Basis Manual*, dated April 23, 2012, and March 1, 2013, Section 1.0, *Overview of the Safety Basis Process*, states that “Sandia managers are required to evaluate the hazards, controls, and potential risks associated with their facilities, operations, and activities. Sandia uses the Primary Hazard Screening (PHS) module of the ISMS software to classify facilities based on hazard severity.” Section 2.2, *Primary Hazards Screening (PHS)*, states that “[c]ompletion and approval of a PHS document is required prior to the start or restart of any work at both Sandia-controlled (i.e., onsite) and non-Sandia-controlled (i.e., offsite) premises . . . [and] [u]pdates to the PHS document are required annually or sooner if there are changes to the activities covered therein.”

Document MN471018, *Work Planning and Control Manual*, April 9, 2013, Section 4.2, *Elements of Analyzing Hazards*, Table 5, *Rigor Level Examples*, provides examples of medium rigor level work, which include “work involving the use of hazardous chemicals, including particularly hazardous substances . . . use of open flame or spark producing work outside of shop in open areas away from combustibles or flammables . . . [and] zero energy verification measurements (high likelihood of de-energized state).” Paragraph 4.2.1, *Determine Level of Rigor*, states that “[t]he following list identifies activities that will always be performed at high rigor level . . . [u]se of primary explosive material and/or use of low energy electro-explosive devices” and “[a]ny type 2 explosives work.”

Document MN471018, paragraph 4.2.2, *Complete Hazard Identification/Analysis*, states that “[f]or all medium and high rigor level work, the work planner must use a JSA or equivalent, whether an activity-level PHS exists or not” and “[t]here are several ways to perform a documented hazard analysis, including:

- “Completing SF-2001-JSA, *Job Safety Analysis*
- Performing a procedure analysis, identifying hazards and appropriate controls step by step, and documenting this analysis within the procedure itself.”

Document MN471018, paragraph 2.4.6 *Authorize Work to Proceed*, requires that the “[l]ine [m]anager/PIC:

- “Ensure work documents are complete, have documented approval, and that they implement the appropriate WP&C requirements.
- Ensure personnel have been informed of the hazards and their defenses and controls.
- Ensure all prerequisites and initial conditions are met, and that all aspects of preparation are adequate for work to commence.
- Authorize work to start in a manner based on rigor level.”

Sandia document ESH100.1.WPC.1, *Plan and Control Work*, November 25, 2013, *Overview*, states that “[f]or any activity-level work accepted after June 1, 2013, and any activity-level work requiring revision or creation of applicable PHSs, TWDs [technical work documents], and JSAs, implement the Work Planning and Control Process detailed in MN471021, *Work Planning and Control Criteria for Safe Design and Operations*.”

Sandia document MN471021, April 1, 2013, Section 4.2, *Establish a Work-Planning Team*, states that “[t]he Level I manager shall establish, or assist the delegated Work Planner in establishing an interdisciplinary team consisting of subject-matter experts [SMEs] necessary to competently address the factors listed in Sections 4.3 and 4.4.” MN471021, Section 4.3, *Identify Hazards, Facility Safety, and NEPA Authorizations*, states that “[t]he Work Planner, supported by an appropriate interdisciplinary team, shall address the following factors in support of a line-management decision on scope:

- “Identify the hazards associated with meeting customer deliverables.

- Determine the highest potential unmitigated-accident-consequence category (see Table 1) using the PHS/HA electronic tools as appropriate.
- Determine if the work is within the authorized operating envelope for the site, facility and workspace, including Safety Basis Manual documentation.”

Contrary to the above requirements, Sandia has failed to ensure adequate analysis of new or modified equipment and facilities to identify potential workplace hazards, and did not facilitate the involvement of the appropriate personnel to address hazard identification, accident consequences, and appropriate work authorization. Additionally, Sandia has failed to adequately evaluate operations, procedures, facilities, and potential interactions to identify workplace hazards. Specific examples include the following:

1. Sandia did not ensure that the FMEA for site 9920 explosive operations adequately addressed the scope of activities, or activity-level hazards, for the test performed on December 11, 2013. As a result, occupational hazards associated with the project test activities were not fully identified or analyzed in PHS 97649227-024, *Explosive Firing Site 9920*, dated August 13, 2013. For example, Sandia did not consider that the testing end unit could be sensitive to electrostatic discharge. Additionally, in the documented HA for site 9920 operations, Sandia did not include potential health risks associated with exposure to elevated noise levels from testing operations, heat stress, and emergency medical response to remote locations.
2. Sandia did not ensure that appropriate technical staff and safety and health SMEs considered the interaction of legacy components and their potential collective safety significance during site 9920 device design, assembly, and testing in accordance with ESH100.1.WPC.1 and MN471021.
3. Sandia did not adequately evaluate operations and facilities to identify workplace hazards, and potential interactions, in the Power Source Technical Group (PSTG) Work Authorization Form (WAF) PSTG-WC-2546-38, dated June 26, 2012, for the building 905, bay 1105F, Li-Ion battery overcharge test conducted on October 26, 2012. The WAF did not:
  - Identify the configuration and placement of the Lexan® battery enclosure in relation to the bay 1105F backdraft exhaust duct and overhead lighting.
  - Identify the placement or use of the “Custom CO2 System,” which PHS SNL05A01039-009 listed as an “Engineering Control-Fire Suppression System” for bay 1105F, and PSTG-GP-SATEPS-1-C, *PSTG Generic Procedure for Safety and Abuse Testing of Electrochemical Power Sources*, dated March 7, 2012, cited as a means to “mitigate additional damage to the test bay and included hardware.” The WAF identified the latter as the applicable operating procedure.
  - Identify a maximum number of batteries or electrolyte volume for test bay 1105F.
  - Identify correct procedures, in that the WAF had an attached checklist for a “60 A-hr Crush Test” instead of the Li-Ion overcharge test being conducted in 1105F and referenced the outdated PHS SNL05A01039-008 instead of SNL05A01039-009, which was in effect at the time of the test.

4. Sandia did not adequately assess and evaluate the configuration of test bay 1105F to determine whether it was appropriate for the October 26, 2012, battery abuse testing, which involved a Li-Ion test unit composed of 20 battery cells containing approximately 1 liter of a combustible electrolyte. Despite the recognized likelihood of fire with the attendant thermal gradient as an outcome, Sandia conducted the Li-Ion test in bay 1105F with overhead lighting/electrical conduit susceptible to heat-induced failure, and a backdraft exhaust duct that was not adequate to capture the rising heat, smoke, and toxic combustion products. Additionally, Sandia did not fully assess and evaluate the modifications of the test bay 1105F electrical circuits that were made in 2009. As a result, the fire-induced failure of overhead lighting electrical conduit caused the exhaust and scrubber systems to shut down, releasing combustion products from the test bay 1105F fire into other areas of laboratory 1105.

Collectively, these noncompliances constitute a recurring Severity Level I violation. (Ref. WEA-2014-04 and WEA-2010-03)

### C. Hazard Prevention and Abatement

Title 10 C.F.R. § 851.22, *Hazard prevention and abatement*, subsection (a), states that “[c]ontractors must establish and implement a hazard prevention and abatement process to ensure that all identified and potential hazards are prevented or abated in a timely manner.” Subsection (b) states that “[c]ontractors must select hazard controls based on the following hierarchy: (1) [e]limination or substitution of the hazards where feasible and appropriate; (2) [e]ngineering controls where feasible and appropriate; (3) [w]ork practices and administrative controls that limit worker exposures; and (4) [p]ersonal protective equipment [PPE].”

Title 10 C.F.R. § 851.23, *Safety and Health Standards*, subsection (a), states that “[c]ontractors must comply with the following safety and health standards that are applicable to the hazards at their workplaces: . . . (3) Title 29 C.F.R. Part 1910, *Occupational Safety and Health Standards*.”

Title 29 C.F.R. § 1910.1030, *Bloodborne Pathogens*, subsection (d), *Methods of compliance*, paragraph (d)(1), *General*, states that “[u]niversal precautions shall be observed to prevent contact with blood or other potentially infectious materials. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.” Subparagraph (d)(3)(i), *Provision*, states that “[w]hen there is an occupational exposure, the employer shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection.” Subparagraph (d)(3)(iii), *Accessibility*, states that “[t]he employer shall ensure that appropriate personal protective equipment in the appropriate sizes is readily accessible at the worksite or is issued to employees.” Subparagraph (d)(3)(vi) states that “[i]f a garment(s) is penetrated by blood or other potentially infectious materials, the garment(s) shall be removed immediately or as soon as feasible.”

Document PG470246, Section 7.0, *Requirements Flow Down*, states: “[t]he principal corporate documents for implementing 10 CFR 851 Subpart C and ensuring compliance with these requirements are the following . . . ES&H Corporate Procedures (i.e., . . . ESH100.2, *Analyze and Control Hazards* . . . )”; and “[t]hese procedures contain information on how management practices prescribed by SNL ISMS are implemented, how hazards associated with SNL work activities are identified and controlled, and who is responsible for hazard identification and hazard control implementation.”

Document ESH100.2, *Analyze and Control Hazards*, paragraph titled *Identifying Controls*, states: “[e]ach hazard identified for a work activity/task is controlled to minimize (if not eliminate) the hazards to which personnel will be exposed”; and “[a]t Sandia, hazards are typically controlled using engineered controls and/or administrative controls as appropriate”; and “[o]ther hazard controls include product substitution, the use of protective clothing and PPE, and pre-job briefings.”

Sandia document MN471011, Chapter 7, *Operating Procedures*, Section 7-1.1, *Requirements*, subsection (b) states that “procedures must be generated for all explosive operations because the step-by-step reasoning process that is used in developing the procedure will identify many safety-related problem areas that might be overlooked otherwise. In addition, the approval system for new or revised procedures also provides other viewpoints and knowledge that may not be available to the originator and may need incorporation into the procedure.”

Contrary to the above requirements, Sandia has failed to adequately implement a hazard prevention and abatement process with selection of controls based on the hierarchy of engineering and administrative controls, and PPE as illustrated by the following examples:

1. Sandia did not consider or effectively implement the hierarchy of controls based on the hazards identified in FMEA-97649227 and PHS 97649227-024 during testing of a device at site 9920. Sandia did not implement such engineering and administrative hazard controls as electronic diagnostic capabilities and external indicator for device status, a safety charge, capacitor monitoring for residual charge, and procedures for assembly/disassembly in the event of an anomalous condition.
2. Sandia did not make PPE readily accessible to the work area or require personnel to remove personal clothing after possible contact with body fluids from the site 9920 injured employee on December 11, 2013.
3. Sandia did not apply an engineering control in the form of appropriate seals for the wire and cable core openings in the walls of test bay 1105F and control room 1105A to prevent leakage of toxic combustion products into occupied areas during battery abuse tests, as recommended by its own assessment report. Sandia exposure assessment report SNLNM03662, LEV For Battery Abuse Laboratory at 905/1105, dated September 1, 2011, states that “personnel shall ensure all ports to the test cell are sealed prior to testing to prevent unnecessary leakage from the test cell.” The test bay and control room wall core

hole openings remained unsealed at the time of the October 26, 2012, Li-Ion battery fire and likely contributed to migration of smoke from the test bay into adjacent areas of laboratory 1105 and building 905.

Collectively, these noncompliances constitute a recurring Severity Level I violation. (Ref. WEA-2014-04 and WEA-2010-03)

#### **D. Emergency Response**

Title 10 C.F.R. § 851, Appendix A.2, *Fire Protection*, states that: (a) “[c]ontractors must implement a comprehensive fire safety and emergency response program to protect workers commensurate with the nature of the work that is performed. This includes appropriate facility and site-wide fire protection, fire alarm notification and egress features, and access to a fully staffed, trained, and equipped emergency response organization that is capable of responding in a timely and effective manner to site emergencies.”

Title 29 C.F.R. § 1910.151, *Medical services and first aid*, subsection (a), states that “[t]he employer shall ensure the ready availability of medical personnel for advice and consultation on matters of plant health.” Subsection (b) states that “[i]n the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid” and “[a]dequate first aid supplies shall be readily available.”

Title 29 C.F.R. § 1910.1030, *Bloodborne pathogens*, subparagraph (g)(2), *Information and training*, states that “(t)he employer shall train each employee with occupational exposure in accordance with the requirements of this section.” Subsection (b), *Definitions*, states that “(o)ccupational (e)xposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee’s duties.”

Sandia document PG470246, Attachment 1, *Functional Areas*, Section 1.7, *Biological Safety*, states that “The purpose of the Biosafety program is to provide safety oversight of research conducted with all biohazardous or potentially biohazardous materials, follow accepted biosafety practices, and ensure compliance with federal, state, and local requirements and guidelines” and “SNL compliance documents [include] . . . ESH100.2.OTH.3, *Control Exposure to Bloodborne Pathogens*.”

Sandia document ESH100.2.OTH.3, *Control Exposure to Bloodborne Pathogens*, paragraph titled *Training Requirements*, November 22, 2013, states that “(n)on-medical Members of the Workforce who perform tasks with a potential for occupational exposure to bloodborne pathogens” are required to “(c)omplete MED113, *Bloodborne Pathogens Training for Non-Medical Personnel*.”

Sandia document MN471011, Chapter 7, Section 7-2.9, *Content of Special or Experimental Procedures*, subsection a, states that “[i]n addition to the applicable requirements listed in

[s]ection 7-2.8 of this chapter . . . [f]ield operations remote to normally occupied areas shall include procedures to ensure prompt response of both fire and medical emergency services or those services shall be staged at the event site.”

Sandia document PG470246, Attachment 1, *Functional Areas*, Section 1.2, *Fire Protection*, states that “[a] separate Emergency Management program addresses site-wide emergency planning and preparedness, emergency response, and access to a fully staffed, trained, and equipped emergency response organization:

- “ESH100.3.1, *Prepare for and Manage Emergencies*
- PN471011, *SNL/NM Emergency Plan* (NM-EM-PLAN-01, 04 November 2008).”

Sandia Corporate Procedure ESH100.3.1, *Prepare for and Manage Emergencies*, Table 6, *During Any Emergency or if Instructed to Evacuate*, Step 1, *Action*, states: “[a]lert others and pull the nearest fire alarm, except in the case of a bomb threat, earthquake (unless there is an actual fire), or if instructed not to do so.” Table 7, *Fire*, Step 1, *Action*, states: “[f]rom a safe location, call 911 or the site emergency number.”

Document FSOP-EFS-001, Section 4.4, *Emergency Guidelines*, states: “(i)n the event of an accident or incident at SNL, personnel shall follow the SNL OOPS process by dialing 911 for emergencies and 411 [311] for non-emergencies.”

Contrary to the above requirements, Sandia did not ensure the ready availability of adequate medical resources and supplies during explosive device testing and ensure that personnel followed the site process for emergencies. Specific examples include the following:

1. Sandia did not ensure that an infirmary, clinic, or hospital was near the site 9920 workplace or provide personnel adequately trained to render first aid in accordance with 29 C.F.R. § 1910.151. Site 9920 non-medical workers, who had not attended training MED113, cared for the injured worker and transported him to the Sandia Medical Clinic on December 11, 2013. They were consequently at risk of exposure to blood without appropriate bloodborne pathogen training.
2. Sandia did not ensure that adequate first aid supplies were available in accordance with 29 C.F.R. § 1910.151 for personnel who assisted the injured worker at site 9920 on December 11, 2013. Some of the first aid supplies in building 9926 were past their expiration dates, and no medical adhesive tape was available to fasten a bandage on the injured employee’s hand (assisting personnel used electrical tape instead).
3. Sandia did not ensure that site 9920 personnel responded to a worker injury on December, 11, 2013, by activating 911 or the site emergency number in accordance with FSOP-EFS-001. Site 9920 personnel transported the injured employee to the SNL medical clinic in a site vehicle instead of requesting emergency medical service.

4. Sandia did not ensure that building 905, laboratory 1105 personnel implemented appropriate fire alarm notification and building egress by activating 911 or the site emergency number when they smelled smoke in the 1105A control room and experienced a bay 1105F ventilation system failure, flickering lights, and a partial power outage in an adjacent laboratory. A worker from adjacent building 858 notified the Sandia Emergency Operations Center, which dispatched the Emergency Response Team (ERT). The ERT activated the fire alarm pull station upon arriving at the site, initiated a building 905 evacuation, and notified the Kirtland Air Force Base Fire Department (KFD) to respond.
5. Sandia did not ensure implementation of appropriate criteria, procedures, analyses, and equipment to extinguish the bay 1105F battery fire. The KFD initially attempted to extinguish the Li-Ion battery fire with a Lith-X® fire extinguisher, which was not appropriate (Lith-X® is intended for lithium metal fires, not for the combustible components of the Li-Ion battery, such as the electrolyte or plastic case). Sandia did not disconnect electrical power to the Li-Ion battery once the fire had started and affected the building systems (e.g., ventilation and electrical power). Sandia did not conduct an adequate hazard assessment of the building 905 penthouse before allowing unprotected personnel to reenter this area, which was still filled with smoke and combustion products, in an attempt to restore building power.

Collectively, these noncompliances constitute a Severity Level I violation.

#### **E. Training and Information**

Title 10 C.F.R. § 851.25, *Training and Information*, subsection (a), states that “(c)ontractors must develop and implement a worker safety and health training and information program to ensure that all workers exposed, or potentially exposed, to hazards are provided with training and information on that hazard in order to perform their duties in a safe and healthful manner.” Subsection (c) states that “(c)ontractors must provide training and information to workers who have worker safety and health program responsibilities that is necessary for them to carry out those responsibilities.”

Sandia document MN471011, Section 2-1.6, *Hazard Identification and Communication*, subsection a, states that “[b]efore beginning explosives operations, managers shall ensure the following . . . 3. [e]ducate and train employees in the hazards and precautions required for handling explosives and materials used in conjunction with explosives operations.”

Contrary to the above requirements, Sandia did not ensure that adequate training and information was provided to all workers who were exposed, or could be exposed, to hazards. Specifically, Sandia did not inform all employees involved with, or affected by, the site 9920 project testing activities of the occupational hazards identified in PHS Number 97549227-04 and FMEA-97649227 in accordance with MN471011. Sandia did not provide documentation indicating that all site 9920 employees who were present on December 11, 2013, reviewed or participated in an area- or task-specific briefing before beginning work.

This noncompliance constitutes a recurring Severity Level II violation.  
(Ref. WEA-2014-04 and WEA-2010-03)

#### **F. Recordkeeping and Reporting**

Title 10 C.F.R. § 851.26, *Recordkeeping and reporting*, subsection (a), *Recordkeeping*, states that: “[c]ontractors must: (1) establish and maintain complete and accurate records of all hazard inventory information, hazard assessments, exposure measurements, and exposure controls”; and “(2) [e]nsure that the work-related injuries and illnesses of its workers and subcontractor workers are recorded and reported accurately and consistent with DOE Manual 231.1-1A, *Environment, Safety and Health Reporting Manual*, September 9, 2004.”

Contrary to the above requirements, Sandia has failed to adequately maintain hazard inventory, assessment, and control information, and did not accurately record work-related injuries. Specific examples include the following:

1. Sandia did not consistently generate and maintain records for design, assembly, and testing of the site 9920 device. Sandia did not ensure that instructional procedures *Emplacing Procedure for the 171379-007 Assembly* and *Assembly Procedure for the 171379-007 Assembly* received a technical review by appropriate health and safety SMEs to ensure completeness and accuracy, and that the documents were available to all project personnel handling the device. Sandia did not complete an A&F checklist as required by FSOP-EFS-001, Section 5.4.4, before initiating testing activities on December 11, 2013. Sandia did not ensure that project notebooks documenting meetings, project tasks, and testing data were available.
2. Sandia did not accurately report emergency room care for the site 9920 injured employee on DOE Form 5484.3, *Individual Accident/Incident Report*, and in the 2013 Computerized Accident/Injury Reporting System (CAIRS). CAIRS report 20130364, updated February 26, 2014, indicated that the injured employee did not receive emergency room treatment, when in fact the worker had been sent to the University of New Mexico Hospital Emergency Room and received medical treatment for his hand injury.

Collectively, these noncompliances constitute a Severity Level II violation.

## II. REPLY

Pursuant to 10 C.F.R. § 851.42(b)(4), Sandia is hereby obligated to submit a written reply within 30 calendar days of receipt of this PNOV. The reply should be clearly marked as a "Reply to the Preliminary Notice of Violation."

If Sandia chooses not to contest the violations set forth in this PNOV, then the reply should clearly state that Sandia waives the right to contest any aspect of this PNOV. In such case, this PNOV will constitute a final order upon the filing of the reply.

If Sandia disagrees with any aspect of this PNOV, then as applicable and in accordance with 10 C.F.R. § 851.42(c)(1), the reply must: (1) state any facts, explanations, and arguments that support a denial of an alleged violation; and (2) discuss the relevant authorities that support the position asserted, including rulings, regulations, interpretations, and previous decisions issued by DOE. In addition, 10 C.F.R. § 851.42(c)(2) requires that the reply include copies of all relevant documents.

Please send the appropriate reply by overnight carrier to the following address:

Director, Office of Enforcement  
Attention: Office of the Docketing Clerk, EA-10  
U.S. Department of Energy  
19901 Germantown Road  
Germantown, Maryland 20874-1290

A copy of the reply should also be sent to my office and the Manager of the Sandia Field Office.

Pursuant to 10 C.F.R. § 851.42(d), if Sandia fails to submit a written reply within 30 calendar days of receipt of this PNOV, Sandia relinquishes any right to appeal any matter in this PNOV and this PNOV, will constitute a final order.

## III. CORRECTIVE ACTIONS

Corrective actions that have been or will be taken to avoid further violations should be delineated, with target and completion dates, in DOE's Noncompliance Tracking System.

  
Frank G. Klotz  
Administrator  
National Nuclear Security Administration

Washington D.C.  
This 17 day of November 2015