Department of Energy
Washington, DC 20585

February 18, 2016

VIA OVERNIGHT UPS MAIL CARRIER

Mr. Philip Breidenbach
President and Project Manager
Nuclear Waste Partnership, LLC
4021 National Parks Highway
Carlsbad, New Mexico 88220

WEA-2016-01

Dear Mr. Breidenbach:

This letter refers to the Department of Energy's (DOE) investigation into the facts and circumstances associated with two events that occurred in February 2014 at the Waste Isolation Pilot Plant (WIPP): (1) a fire in a salt haul truck in the underground, and (2) a radiological release. The Office of Enterprise Assessments' Office of Enforcement provided the results of the investigation to Nuclear Waste Partnership, LLC (NWP) in an investigation report dated May 8, 2015. An enforcement conference was convened on June 16, 2015, with you and members of your staff to discuss the report's findings and NWP's response. A summary of the enforcement conference and list of attendees is enclosed.

The violations associated with the WIPP salt haul truck fire and radiological release are serious, and DOE considers these events to be of the highest safety significance. Both events were a near miss with respect to serious injury or fatality. These events revealed deficiencies in (1) the development and implementation of written plans and assessments, (2) fire prevention and preventive maintenance, (3) the emergency response program, (4) recordkeeping, (5) information requirements, (6) quality improvement, (7) work processes associated with the event response, (8) radiation protection design and associated work processes, (9) program establishment and administration, (10) training, and (11) work processes associated with waste characterization and acceptance. DOE is extremely concerned that, prior to these events, the above deficiencies remained undetected and uncorrected by your contractor assurance program, and that they stemmed in large part from your failure to conduct operations with the rigor and standard of performance expected of a nuclear facility.

Based on an evaluation of the evidence in this matter, including information presented at the enforcement conference, DOE concludes that NWP violated worker safety and health requirements contained in 10 C.F.R. Part 851, *Worker Safety and Health Program*, and nuclear safety requirements contained in

10 C.F.R. § 820.11, *Information Requirements*; 10 C.F.R. Part 830, *Nuclear Safety Management*; and 10 C.F.R. Part 835, *Occupational Radiation Protection*. Accordingly, DOE hereby issues the enclosed Preliminary Notice of Violation (PNOV), which cites four Severity Level I violations and seven Severity Level II violations.

The DOE Carlsbad Field Office (CBFO) reduced NWP's contract fee in the amount of $356,438 as a result of the salt haul truck fire, including associated worker safety and health deficiencies. CBFO reduced the fee by an additional $561,266 after the radiological release event, including associated nuclear safety deficiencies and the cumulative impact of both events. Therefore, in accordance with 10 C.F.R. § 851.5 (c), DOE proposes no civil penalties for the worker safety and health violations cited in this PNOV. For the violations of the nuclear safety requirements enforceable under 10 C.F.R. Part 820, *Procedural Rules for DOE Nuclear Activities*, DOE has elected to exercise enforcement discretion in recognition of the contract fee reductions that CBFO has already imposed on NWP and proposes no civil penalties.

Pursuant to 10 C.F.R. § 851.42, *Preliminary Notice of Violation*, and 10 C.F.R. § 820.24, *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 fail to submit a reply within the 30 calendar days, then in accordance with 10 C.F.R. § 851.42(d), you relinquish any right to appeal any worker safety and health violation cited in the PNOV, and the PNOV will constitute a final order. In addition, if you fail to submit a reply within the 30 calendar days, then in accordance with 10 C.F.R. § 820.33, *Default order*, subsection (a), DOE may pursue a Default Order for any nuclear safety violation cited in the PNOV.

After reviewing your reply to the PNOV and any proposed additional corrective actions entered into DOE's Noncompliance Tracking System, DOE will determine whether any further activity is necessary to ensure compliance with DOE nuclear safety and worker safety and health requirements. DOE will continue to monitor the completion of corrective actions until this matter is fully resolved.

Sincerely,

Steven C. Simonson

Steven C. Simonson
Director
Office of Enforcement
Office of Enterprise Assessments

Enclosures: Preliminary Notice of Violation (WEA-2016-01)
Enforcement Conference Summary and List of Attendees

cc: Todd Shrader, CBFO
Shane Hendrickson, NWP

Enclosure 1

Preliminary Notice of Violation

Nuclear Waste Partnership, LLC
Waste Isolation Pilot Plant

WEA-2016-01

A U.S. Department of Energy (DOE) investigation into the facts and circumstances associated with the salt haul truck fire and radiological release events at the Waste Isolation Pilot Plant (WIPP) in February 2014 revealed multiple violations of DOE worker safety and health and nuclear safety requirements by Nuclear Waste Partnership, LLC (NWP). DOE provided NWP an investigation report, dated May 8, 2015, and convened an enforcement conference on June 16, 2015, with NWP representatives to discuss the report's findings and NWP's response.

Pursuant to Section 234C and 234A of the Atomic Energy Act of 1954, as amended, and DOE regulations set forth at 10 C.F.R. Part 851, *Worker Safety and Health Program*, and 10 C.F.R. Part 820, *Procedural Rules for DOE Nuclear Activities*, DOE hereby issues this Preliminary Notice of Violation (PNOV) to NWP. The violations included (1) deficiencies in the development and implementation of written plans and assessments, (2) fire prevention and preventive maintenance, (3) the emergency response program, (4) recordkeeping, (5) information requirements, (6) quality improvement, (7) work processes associated with the event responses, (8) radiation protection design and associated work processes, (9) program establishment and administration, (10) training, and (11) work processes associated with waste characterization and acceptance. DOE has grouped and categorized the deficiencies as four Severity Level I violations and seven Severity Level II violations.

Severity Levels are explained in Part 851, Appendix B, *General Statement of Enforcement Policy*, and Part 820, Appendix A, *General Statement of Enforcement Policy*. Subparagraph VI(b)(1) of Part 851, Appendix B, 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." Similarly, paragraph VI(b) of Part 820, Appendix A, states that "[s]everity Level I is reserved for violations of DOE Nuclear Safety Requirements which involve actual or high potential for adverse impact on the safety of the public or workers at DOE facilities."

Subparagraph VI(b)(2) of Part 851, Appendix B, 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." Similarly, paragraph VI(b) of Part 820, Appendix A, states that "Severity Level II violations represent a significant lack of attention or carelessness toward responsibilities of DOE contractors for the protection of public or worker safety which

could, if uncorrected, potentially lead to an adverse impact on public or worker safety at DOE facilities."

In accordance with 10 C.F.R. § 851.5(b) and DOE Acquisition Regulation 48 C.F.R. § 970.5215-3, *Conditional Payment of Fee Clause*, Section (b)(2) Clause under Contract No. DE-EM0001971 between DOE and NWP, the DOE Carlsbad Field Office (CBFO) reduced NWP's fee in the amounts of $356,438 and $561,266 in response to the salt haul truck fire and radiological release events, respectively, including the worker safety and health and nuclear safety violations associated with these events. As a result, and pursuant to 10 C.F.R. § 851.5(c), DOE proposes no civil penalty for the worker safety and health violations cited in this PNOV. For the violations of the nuclear safety requirements stated in 10 C.F.R. § 820.11, 10 C.F.R. Part 830, and 10 C.F.R. Part 835, DOE has elected to exercise enforcement discretion in recognition of the contract fee reductions that CBFO imposed on NWP and proposes no civil penalties.

As required by 10 C.F.R. § 851.42(b) and 10 C.F.R. § 820.24(a), and consistent with Part 851, Appendix B, and Part 820, Appendix A, the violations are listed below. Citations that specifically reference the quality assurance criteria of 10 C.F.R. § 830.122 also imply violations of § 830.121(a), which requires compliance with those quality assurance criteria. If this PNOV becomes a final order, NWP may be required to post a copy of the worker safety and health violations cited under Section I of this PNOV in accordance with 10 C.F.R. § 851.42(e).

I. VIOLATIONS – WORKER SAFETY AND HEALTH

A. Written Plans and Assessments

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." Document WP 15-GM.02, *Worker Safety and Health Program Description*, Revision 8, dated September 9, 2013, documents NWP's programs, policies, requirements, processes, methods, and procedures for compliance with 10 C.F.R. Part 851.

Title 10 C.F.R. Part 851, Appendix A, *Worker Safety and Health Functional Areas*, Section 2, Fire Protection, subsection (b), states "[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 [requiring comprehensive worker protection] is met. This includes meeting applicable building codes and *National Fire Protection Association* (NFPA) codes and standards."

Document WP 15-GM.02 states that NWP's worker safety and health program invokes the requirements of the Department of Labor, Mine Safety and Health Administration (MSHA) found at Title 30 C.F.R. Parts 47, 48, 49, 57, and 62, and applies these standards to the Underground (U/G) and related surface structures.

Title 30 C.F.R. § 57.8520, *Ventilation plan*, states that "[a] plan of the mine ventilation system shall be set out by the operator in written form" and that "[r]evisions of the system shall be noted and the plan updated at least annually." Subsection (a) states the plan shall contain "[t]he mine name." Subsection (e) states that the plan shall contain "[t]he number and type of internal combustion engine units used underground, including make and model of unit, type of engine, make and model of engine, brake horsepower rating of engine, and approval number."

NFPA 122, Section 5.1, *Fire Risk Assessment*, subsection 5.1.1 states that "[a] documented fire risk assessment shall be performed for all diesel-powered underground mining equipment." Paragraph 5.1.7 states that "[t]he fire risk assessment shall include evaluation of the risk potential for the start and spread of a fire and the generation of smoke, gases, or toxic fumes that could endanger the lives and safety of personnel or cause damage to property." Section 5.2, *Risk Reduction*, paragraph 5.2.1, states "[r]isk reduction practices shall follow the principles of minimizing ignition sources, reducing exposure of combustible materials to ignition sources, and controlling or suppressing fire spread."

Contrary to the above requirements:

1. NWP failed to identify and include, in the fire protection program, the minimum requirements for safeguarding life against fire and related hazards associated with nonmetal underground mining. NFPA 122, *Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities*, 2010, was not incorporated into NWP's fire protection program and implementing documents (e.g., Baseline Needs Assessment).

2. NWP failed to develop and implement written plans and assessments necessary to achieve compliance with Title 30 C.F.R. and NFPA 122 requirements, as evidenced by the following:

    a. NWP did not include in 00CD-0001, *WIPP Mine Ventilation Plan*, Rev. 36, dated November 15, 2013, a list of all diesel equipment used underground as required by 30 C.F.R. § 57.8520(e). Table 2 of the mine ventilation plan in effect at the time of the salt haul truck fire, dated November 15, 2013, included the list of diesel equipment. However, four pieces of diesel equipment were not listed in Table 2 but were in the U/G at the time of the salt haul truck fire: two S570 Bobcat forklifts, numbers 120649 and 120652; one S160 Bobcat, with no number; and one S750 Bobcat Skid Steer, number ATDZ 13288, with WIPP Equipment number 74-H-042.

    b. NWP did not document a fire risk assessment and associated risk reduction practices for the diesel-powered mining equipment (e.g., salt haul trucks) and self-propelled and mobile surface mining equipment.

Collectively, these noncompliances constitute a Severity Level II violation.

B. Fire Prevention and Preventative Maintenance

Title 10 C.F.R. § 851.22, *Hazard prevention and abatement*, requires contractors to "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 (a)(2) states that "[f]or existing hazards identified in the workplace, contractors must: (i) [p]rioritize and implement abatement actions according to the risk to workers; (ii) [i]mplement interim protective measures pending final abatement; and (iii) [p]rotect workers from dangerous safety and health conditions."

Title 30 C.F.R. § 57.4102, *Spillage and leakage*, states that "[f]lammable or combustible liquid spillage or leakage shall be removed in a timely manner or controlled to prevent a fire hazard."

Title 30 C.F.R. § 57.14100, *Safety defects; examination, correction and records*, subsection (a) states "[s]elf-propelled mobile equipment to be used during a shift shall be inspected by the equipment operator before being placed in operation on that shift." Subsection (b) states that "[d]efects on any equipment, machinery, and tools that affect safety shall be corrected in a timely manner to prevent the creation of a hazard to persons." Subsection (c) states that "[w]hen defects make continued operation hazardous to persons, the defective items including self-propelled mobile equipment shall be taken out of service and placed in a designated area posted for that purpose, or a tag or other effective method of marking the defective items shall be used to prohibit further use until the defects are corrected."

Title 30 C.F.R. § 57.14200, *Warnings prior to starting or moving equipment*, states that "[b]efore starting crushers or moving self-propelled mobile equipment, equipment operators shall sound a warning that is audible above the surrounding noise level or use other effective means to warn all persons who could be exposed to a hazard from the equipment."

NFPA 122, Section 4.2, *Housekeeping*, Paragraph 4.2.3 states that "[m]aintenance operations shall include written procedures and practices to identify and prevent leakage and accidental escape of flammable or combustible liquids."

NFPA 122, Section 7.2, *Equipment Inspection and Maintenance*, states that "[h]ydraulic fluid, coolant, lubrication and fuel lines, electrical wiring, mechanical components, and fire prevention devices shall be inspected and maintained in accordance with the manufacturer's recommendations." Section 7.4, *Fixed Suppression Systems*, states that "diesel-powered equipment shall be protected by a fixed fire suppression system to support the largest anticipated fires in the protected areas." Paragraph (2) states that the fixed fire suppression system "[b]e automatically actuated by a fire detection system."

Contrary to the above requirements, NWP failed to implement maintenance procedures in the U/G that were necessary to prevent and control the spread of fire. Examples include:

1. NWP did not implement a hazard prevention and abatement process to effectively assess the potential risk to workers while components of critical systems, such as ventilation,

fire protection, and mobile equipment safety features, were out-of-service (several components had been out-of-service or in reduced status for more than 6 months). Additionally, NWP did not implement interim protective measures until the critical systems could be returned to normal operation.

2. NWP did not remove flammable or combustible liquid spillage or leakage on the Eimco Mining Machinery, International (EIMCO) Salt Haul Truck 74-U-006B, which caught fire on February 5, 2014. The investigation of the salt haul truck fire revealed that other mining equipment, including the EMICO Salt Haul Truck 74-U-006A, also had significant buildup of engine and hydraulic oil.

3. NWP did not inspect and maintain the EIMCO 985 series salt haul truck in accordance with the manufacturer's recommendations. The manufacturer's *Prestart Checks and Daily Operator Maintenance* checklist states "to check for any leaks and to correct or report to service man." On February 13, 2014, Salt Haul Truck 74-U-006A, the second salt haul truck, had an active and significant buildup of engine oil and hydraulic leaks that were not documented on the *Prestart Checks and Daily Operator Maintenance* checklist. On the day of the fire, the truck had been taken out of service, but only because of a malfunctioning light.

4. NWP did not remove EIMCO Salt Haul Truck 74-U-006B from service after inspections by equipment operators identified defects that posed safety hazards with the continued operation of the equipment. These defects include:

    - Faulty hydraulic hose and fitting
    - Faulty engine kill switch (two occurrences)
    - Faulty engine kill switch cable
    - Inoperable backup alarm (three occurrences)
    - Inoperable head lights
    - Inoperable horn (three occurrences)
    - Leaking hydraulic hose on top of the articulating joint
    - Oil leak (three occurrences)

5. NWP did not maintain the EIMCO 985 (75-U-006B) salt haul truck in accordance with the maintenance schedule recommended in the manufacturer's service manual. Examples include:

    a. The service manual recommends that the battery level be checked/restored at 125 hour intervals, but NWP performs this check every 500 hours.

    b. The service manual recommends inspection of the front axle bolster rubber pads and bushings every 125 hours, but NWP performs this inspection every 500 hours.

    c. NWP procedures did not document the maintenance items listed in the manufacturer's service manual for checking both the air intake vacuum (at 20 inches) and the exhaust back pressure (at 30 inches) on a manometer every 250 hours.

6. NWP provided the EIMCO 985 (75-U-006B) salt haul truck with a manually actuated, instead of an automatically actuated, fire suppression system.

Collectively, these noncompliances constitute a Severity Level I violation.

C. Emergency Response Program

Title 30 C.F.R. § 57.4360, *Underground alarm systems*, states that "[f]ire alarm systems capable of promptly warning every person underground … shall be provided and maintained in operable condition."

Title 30 C.F.R. § 57.4760 *Shaft mines*, states, at subsection (a), that "[s]haft mines shall be provided with at least one of the following means to control the spread of fire, smoke, and toxic gases underground in the event of a fire: control doors, reversal of mechanical ventilation, or effective evacuation procedures. If used as an alternative, control doors shall be closed or opened only according to predetermined conditions and procedures [and] … clear of obstructions."

Title 30 C.F.R. § 57.8532, *Opening and closing ventilation doors*, states "[w]hen ventilation control doors are opened as a part of the normal mining cycle, they shall be closed as soon as possible to re-establish normal ventilation to working places."

Title 30 C.F.R. § 57.11051, *Escape Routes*, states "[e]scape routes shall be (a) [i]nspected at regular intervals and maintained in safe, travelable condition, and (b) [m]arked with conspicuous and easily read direction signs that clearly indicate the ways of escape."

Title 30 C.F.R. § 57.15030, *Provision and maintenance of self-rescue devices*, states "[a] 1-hour self-rescue device approved by MSHA and [National Institute of Occupational Safety and Health (NIOSH)] under 42 CFR part 84 shall be made available by the operator to all personnel underground. Each operator shall maintain self-rescue devices in good condition."

Title 30 C.F.R. § 57.20032, *Two-way communication equipment for underground operations*, states "[t]elephones or other two-way communication equipment with instructions for their use shall be provided for communication from underground operations to the surface."

1. Contrary to the above requirements, NWP failed to implement an emergency response program in the U/G necessary to ensure notification of all workers and provision of appropriate emergency egress conditions. Examples include:

    a. NWP did not provide a fire alarm capable of warning every worker underground. Workers specifically stated that they could not hear the audible signal, see the strobe lights, or understand the muffled messages on the paging system during the salt haul truck fire event.

    b. NWP did not inspect and maintain escape routes in a safe, travelable condition, as required. Some of the U/G escape direction signs (green and red reflectors) were

concealed by their placement under the mesh fence along the ribs (sides) of drifts while others were hidden by material stored in the mine. Additionally, it was noted that for significant distances in the escapeways, the reflector spacing was insufficient to adequately mark the escapeway (e.g., in E-140/S-1600, reflectors could not be seen; only one reflector was located in E-140 between S-1000 and S-1300; and only two reflectors were placed between S-1300 and S-1600). Large quantities of materials were staged haphazardly throughout the mine, some on the same side of the drift as the green and red reflectors and blocking them. Poor housekeeping throughout the mine hampered workers in navigating to the egress point in the reduced visibility environment.

c. NWP did not follow the manufacturer's inspection procedures and service life plan approved by MSHA and NIOSH for the Ocenco, Inc. (OCENCO) Escape Breathing Apparatus (EBA) 6.5 Self-Contained Self-Rescuer (SCSR) stored underground for use during a mine emergency evacuation. For example, the OCENCO Users' Manual requires stored devices to be inspected every 90 days for damage or other defects. A random selection of 15 SCSRs stored underground on cart 74-C-257 and in the SCSR storage caches underground at E-140/S-1600 and W-30/S-1300 had not been inspected at 90 day intervals before the salt haul truck fire.

d. NWP did not maintain, as required, two-way communication equipment for U/G operations in that several mine phones were inoperable.

2. Contrary to the above requirements, NWP failed to implement pre-conditional procedures for defining the conditions for opening and closing of ventilation control doors. NWP also did not maintain the ventilation control doors to be clear of obstructions rendering them inoperable. For example, ventilation control doors 401 and 504 were chained open for extended periods of time. In a chained configuration, neither door could be remotely operated from the Central Monitoring Room in an emergency.

Collectively, these noncompliances constitute a Severity Level I violation.

D. Recordkeeping

Title 10 C.F.R. § 851.26, *Recordkeeping and reporting*, subsection (a)(1), states that contractors must "[e]stablish and maintain complete and accurate records of all … hazard assessments."

Contrary to the above requirement, NWP incorrectly reported in DOE/WIPP 11-3471, *Baseline Needs Assessment (BNA), for the Waste Isolation Pilot Program Plant*, Rev. 1, that the old communicator system had been replaced. Old amplifiers were still installed in the communication paging system even though the BNA stated that a new system was placed in service in August 2012. The investigation revealed that the communicator paging system was not audible to some of the personnel evacuating the U/G.

This noncompliance constitutes a Severity Level II violation.

II. VIOLATIONS – NUCLEAR SAFETY

A. Information Requirements

Title 10 C.F.R. § 820.11, *Information requirements*, paragraph (a) states that "[a]ny information pertaining to a nuclear activity provided to DOE by any person or maintained by any person for inspection by DOE shall be complete and accurate in all material respects…."

NWP procedure WP 13-1 , *Quality Assurance Program Description* (QAPD), Section 1.4.1, Document Preparation, Review and Approval, states that "[d]ocuments that specify or prescribe work shall be reviewed for adequacy, correctness, and completeness prior to approval and issuance as controlled documents." This section also specifies additional criteria for such documents as technical reports. Section 1.4.4 of the QAPD states that "[d]ocument changes shall be…[c]learly indicated in the changed document."

The WIPP *Documented Safety Analysis* (DSA) is inaccurate and incomplete with respect to the evaluation of hazards/accidents, as illustrated by the following:

1. Section E.5, Safety Analysis Overview, of the DSA states that "[s]even design-basis accidents (DBA) were identified and involve [among others] … a roof fall in an active disposal room in the U/G." However, DSA Section 3.4.2, Design-basis Accidents, does not include an analysis of a roof fall in an active panel in the U/G (i.e., a room in the U/G at WIPP where waste emplacement operations are currently under way).

2. The description of the roof fall event in the DSA is inaccurate and incomplete. According to DSA Section 3.3.1.2.4, Hazard Evaluation Process, "[t]he final sequence of numbers (001, 002, etc.) group related events. An alpha indicator ("b," "c," etc.) represents actual events within an event category that are bounded by a bounding and representative event description (always an 'a' indicator)." DSA Table 3.3.5, *Hazard Evaluation Table*, event number CH/RH-UG-30-001a, *Roof fall in a closed panel*, bears an "a" indicator, even though it cannot be characterized as a bounding and representative event for a roof fall in an active panel in the U/G.

NWP was in error for not including the hazard scenario for a roof fall in an open panel in the DSA, because the DSA's analysis of a roof fall in a closed panel cannot be described as bounding with respect to the consequences of the event. In addition, NWP did not provide the basis for this significant change when it issued revision 4 of the DSA. The Office of Enforcement reviewed this information and concluded that by not including this event in the DSA in the appropriate manner, NWP did not ensure that the DSA was complete and accurate in all material respects.

Collectively, these noncompliances constitute a Severity Level II violation.

B. Quality Improvement

Title 10 C.F.R. § 830.122(c), *Criterion 3 – Management/Quality Improvement*, requires contractors to "(1) [e]stablish and implement processes to detect and prevent quality problems[;] (2) [i]dentify, control, and correct items, services, and processes that do not meet established requirements[;] (3) [i]dentify the causes of problems and work to prevent recurrence as a part of correcting the problem[;] and (4) [r]eview item characteristics, process implementation, and other quality-related information to identify items, services, and processes needing improvement."

QAPD Section 1.3, Quality Improvement, states that "NWP shall establish and implement processes to detect and prevent quality problems, promote quality improvement, and manage issues."

Contrary to these requirements, NWP did not establish and implement processes for compliance with Criterion 3, as evidenced by the following:

1. Reviews and assessments in the years before the radiological release revealed weaknesses in the WIPP emergency management program that remained uncorrected. The conclusion of Section 4.0, Emergency Management, of the Accident Investigation Board (AIB) report for the radiological release states that "[w]eaknesses in classification, categorization, and emergency action levels were previously identified by both external review and in response to the U/G fire and the radiological release event." It also states that "NWP needs to take prompt action to correct longstanding deficiencies from previous reviews." An NWP independent assessment completed in July 2014, five months after the event, found that all 15 elements of the NWP emergency management program were deficient.

2. As indicated during the Office of Enforcement's interviews with NWP personnel, and as reflected in the AIB report for the radiological release, Section 5.1, NWP personnel were reluctant to use the "WIPP Form" process and other issue and deficiency identification processes, such as Occurrence Reporting and Processing System reports, nonconformance reports, and inspection reports.

3. Persistent operational problems with the U/G Continuous Air Monitors (CAMs) – i.e., numerous false alarms, extensive unavailability – were not corrected and played a significant role in NWP personnel's inadequate response to the radiological release. A WIPP form on the U/G CAMs issues was submitted in early 2013 but had not been acted on a year later.

4. As documented in the AIB report for the radiological release, Section 11.0, NWP Contractor Assurance System, "[m]ultiple external reviews have identified deficiencies in Work Planning & Control, Emergency Management, Issues Management, and Fire

Protection" in the time preceding the WIPP radiological release, but NWP had not effectively addressed those deficiencies.

Collectively, these noncompliances constitute a Severity Level II violation.

C. Work Processes – Event Response

Title 10 C.F.R. § 830.122(e), *Criterion 5 - Performance/Work Processes*, paragraph (1) requires contractors to "[p]erform work consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means."

Title 10 C.F.R § 835.104, *Written procedures*, states that "[w]ritten procedures shall be developed and implemented as necessary to ensure compliance with this part, commensurate with the radiological hazards created by the activity and consistent with the education, training, and skills of the individuals exposed to those hazards."

NWP requirements for work processes are documented in DOE/WIPP-95-2054, *WIPP Radiation Protection Plan* (RPP), and WP 04-CO.01-16, *Conduct of Operations Program - Operations Procedures*. RPP Appendix A, "Radiation Protection Program Compliance Statements," states that "[w]ritten procedures are required to be developed for routine operations per WP 04-CO.01-16…NWP written programs and procedures were evaluated for maintaining doses as low as reasonably achievable (ALARA) which are appropriate to support current TRU [transuranic] waste operations with the staff as currently trained and qualified to implement the programs and to perform the steps in the procedures." WP 04-CO.01-16, Section 3.2.2, states that "[p]rocedures shall be developed for all anticipated operations, evolutions, tests, and abnormal or emergency situations," and Section 3.1.1 states that "WIPP management expects that operators will use written procedures for operating plant equipment or performing operational evolutions, will perform the procedures as written, and will stop work and notify management when procedures cannot be executed as written."

Contrary to these requirements, in many cases the procedures necessary for personnel to perform assigned emergency response duties were not in place, were inadequate for performing the activity, or were not implemented consistent with applicable standards, controls, instructions, or procedures. Specific examples include:

1. Contrary to WP 04-CO.01-16, Section 3.2.2, procedures have not been developed "for all anticipated operations, evolutions, tests, and abnormal or emergency situations." Some existing procedures, such as WP 12-ER4903, *Radiological Event Response*, attempt to give generic directions, which are inadequate for appropriately responding to the unique needs of each potential radiological condition described in Section 1.0 of this procedure. Conditions for which procedures were inadequate include an U/G CAM "HI-HI" radiation alarm; a CAM alarm caused by a release from a TRU waste container; an actual or suspected breach due to an accident; and performance failure of a shielded waste container.

2. Procedure WP 04-EM4200, *Radiation Monitoring System Alarm Response*, does not address the actions to be taken to respond to a HI-HI radiation alarm or reference another procedure (e.g., WP 12-ER4903) that would direct the proper response.

3. The note at the start of the Immediate Actions portion of the U/G CAM Alarms section of procedure WP 04-EM-4200 states that "[i]f the U/G is not manned, then the CMRO [CMR Operator] is to immediately contact the FSM [Facility Shift Manager] when an alarm is detected," instead of performing Sections 1.0 through 4.0 of the procedure. However, even if the U/G is not manned, personnel (e.g., collocated workers or the public on the surface) downstream of the U/G ventilation exhaust stack could still be exposed to airborne radioactivity, and this procedure does not direct the CMRO or the FSM to take appropriate actions so that personnel can avoid this potential hazard in case of a U/G CAM HI-HI radiation alarm.

4. In response to the radiological release, NWP personnel did not implement procedure WP 12-ER4903, as required. The CMRO received notification of an "[u]nderground (U/G) continuous air monitors (CAMs) HI-HI radiation alarm" at 11:14 p.m. on February 14, 2014, and WP 12-ER4903, Section 1.0, describes this alarm as one of the entry conditions for this procedure. However, NWP personnel did not enter this procedure at that time and no entry regarding this procedure was made in the CMRO log at that time. Instead, CMROs were directed to look at the procedure and take some of the actions described there. Certain key steps, however, such as a radioactive event announcement, were not taken for several hours.

5. Procedure WP 12-ER4903, Section 2.0, Automatic Actions, inaccurately describes a key plant system in stating that "[a] HI-HI alarm from a U/G CAM triggers an automatic U/G ventilation shift-to-filtration." The shift to filtration is not automatic. In fact, to make the shift-to-filtration, the operator must open the 860 ventilation fan vortex manually to avoid improper functioning. Proper functioning of the U/G ventilation shift-to-filtration also requires manual operation of the BHR-707 bulkhead door regulator.

6. Procedure WP 12-ER4903, Step 4.2, states that "FSM, IF the event or accident results in an unfiltered radiological release to the environment, THEN implement WP 12-ER3002, *Emergency Operations Center Activation*, and WP 12-ER4902, *Hazardous Material Spill and Release Response*, and the Contingency Plan." NWP personnel did not implement this step even when presented with strong evidence (i.e., Station B exhaust filter samples) of an unfiltered radiological release to the environment.

7. There were deficiencies in procedure WP 12-ER4907, *Evacuation/Sheltering in Place*, and its implementation. This procedure does not include provisions to ensure that personnel sheltering in place are informed of the prohibition against eating, drinking, or smoking in the absence of a survey to verify that no contamination is present. Furthermore, in the absence of the warden, the NWP supervisors are assigned "warden duty" even though they are not trained on this procedure. Finally, NWP staff delayed the order to shelter in place until some NWP staff could transit to other locations on site,

although this action involved transit without personal protective equipment (PPE) through areas of the plant where there was a known risk of airborne contamination.

Collectively, these noncompliances constitute a Severity Level I violation.

D. Radiation Protection Design and Work Processes

Title 10 C.F.R. § 830.122(e), *Criterion 5 - Performance/Work Processes*, requires contractors to "(1) [p]erform work consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means."

Title 10 C.F.R. § 835.1001, *Design and Control*, states that "(a) [m]easures shall be taken to maintain radiation exposure in controlled areas ALARA through engineered and administrative controls. The primary methods used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding). Administrative controls shall be employed only as supplemental methods to control radiation exposure. (b) For specific activities where use of engineered controls is demonstrated to be impractical, administrative controls shall be used to maintain radiation exposures ALARA."

Title 10 C.F.R § 835.104, *Written procedures*, states that "[w]ritten procedures shall be developed and implemented as necessary to ensure compliance with this part, commensurate with the radiological hazards created by the activity and consistent with the education, training, and skills of the individuals exposed to those hazards."

In addition to the deficiencies in work processes identified in section II. C of this PNOV, unique deficiencies in work processes were identified for the Radiation Protection organization and in the administrative controls NWP used to maintain radiation exposures ALARA, as follows:

1. The *Radiation Safety Manual* (RSM), WP 12-5, Section 3.11.1, Logs and Communications, requires that "[r]adiological control [RadCon] personnel maintain a logbook to document radiological occurrences, status of work activities, and other relevant information. On-coming RCTs [RadCon technicians] review the log and receive a turnover briefing from the personnel they are relieving." In addition, procedure WP 04-CO.01-11, Logkeeping, Section 3.14, identifies a RadCon organization representative as a key position requiring a narrative log for recording information.

   However, contrary to these requirements, interviews with NWP RadCon personnel revealed that logbooks are not maintained to document such information. The AIB report for the WIPP radiological release, Section 6.0, Conduct of Operations, also states that "[i]nterviews with RCTs and their immediate supervisors confirmed that a narrative log is not being maintained by the RCTs."

2. RSM Section 4.8, Control of Airborne Radioactivity, states that "Radiological Control is notified when engineering controls that prevent worker exposure to airborne

radioactivity, such as barriers, glove boxes, and glove bags, are compromised. An evaluation is made of continuing operations with compromised engineering controls. The use of respiratory protection to continue activities under these conditions is discouraged. Implementation of short-term engineering modifications that provide a commensurate level of worker protection is the preferred alternative." Contrary to these requirements, RadCon management was aware, prior to the radiological release, that changing the Station B filter with the U/G ventilation system in filtration mode represented a condition in which air flows outward from the radiation sample station, but they did not implement engineering controls (e.g., shutoff valve) and did not identify proper PPE controls to protect RadCon workers from unnecessary airborne contamination when changing these filters.

3. RSM Section 3.5, Control of Internal Exposure, establishes required "controls to activities authorized in accordance with the above requirements," including stay times, use of CAMs or air samplers with expedited assessment and analysis results, and recording of the time spent in the area with potential airborne contamination. Contrary to these requirements, RadCon personnel performing duties in the wake of the radiological release often did so without these controls in place. For example:

    a. While changing air filters at Station B, RCTs commented that air was noticeably blowing outward from the sample specimen location, but no special precautions were put in place to address this situation.

    b. RCTs conducted site surveys without CAMs or portable air samplers present in the area where they were working.

    c. NWP personnel coming on site February 15, 2014, passed through areas where surveys had not yet been completed and where there was a potential for the presence of airborne contamination.

    d. Stay times were not established, and the time spent in the potential presence of airborne radiation was not recorded.

4. The NWP procedure for unusual radiological conditions, WP 12-HP4000, *Emergency Radiological Control Responses*, was not implemented, as illustrated by the following examples:

    a. During interviews, NWP personnel did not indicate that executing this procedure was a priority in the wake of the WIPP radiological release. Instead, the RadCon organization's response was planned and executed in the midst of the event, without the benefit of this procedure.

    b. One of the few instructions found in this procedure is in Section 1.3.1, where RCTs are instructed to "[d]on Personal Protective Equipment (PPE) and perform radiological monitoring as directed by RC Engineer (RCE). Monitor personnel and affected areas, and areas immediately outside posted boundary of impacted area in

accordance with WP 12-HP1100 and WP 12-HP3500 [*Airborne Radioactivity*]." However, when RCTs raised the issue of donning PPE on February 15, 2014, their supervisor directed them to proceed without PPE, even though there was evidence of airborne radioactivity above ground.

c. Section 1.4, Exit Conditions, states that "RCT logbook entries describing the event, immediate actions, and subsequent actions have been made." However, since no "RCT logbook" was kept, no entries were made.

5. Procedure WP 12-HP3500 does not include steps for actions to take in the presence of airborne radioactivity when changing the exhaust sample filter, even though the potential for such an environment is foreseeable and there are no engineered controls to prevent it. This procedure also makes no mention of the potential need to develop a radiological work permit before changing the exhaust sample filters downstream of the high-efficiency particulate air (HEPA) filters in the presence of a potential airborne radioactivity hazard. As a result, NWP personnel performing exhaust sample filter changes in the wake of the radiological release were left to improvise an approach to this work.

Collectively, these noncompliances constitute a Severity Level II violation.

E. Program Establishment and Administration

Title 10 C.F.R. § 830.122(a), *Criterion 1—Management/Program*, states that the contractor must "(1) [e]stablish an organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing the work. (2) Establish management processes, including planning, scheduling, and providing resources for the work."

NWP program requirements are set forth in procedure WP 04-CO.01-1, *Operations and Organization Administration*. Deficiencies in the NWP program established to ensure compliance with regulatory program requirements regarding nuclear safety are illustrated by the following:

1. NWP did not ensure that adequate personnel resources were managed so as to ensure that key mission functions, such as operations and emergency response, would be adequately supported. Specifically, operations during the WIPP backshift had to rely on "on-call radiological support" to implement key procedures for major radiological event response, but a number of factors substantially reduced the effectiveness of this approach:

   a. Although a duty roster indicated which nights certain RadCon personnel were on call, there were few requirements to ensure that the on-call personnel could actually be contacted, and the call-in process was not routinely tested. Personnel who were on call were not directed to keep their phones on and audible, or to be fit for duty if called. In a related issue, some NWP personnel indicated that pager reception in the

town of Carlsbad, New Mexico is poor, so they would sometimes not receive a page on time. NWP did not correct this condition in a timely manner.

b. On-call radiological support personnel, like almost all WIPP personnel, generally need an hour or more to get from their homes to the isolated WIPP site. In addition, some plant locations lack a real-time radiation monitoring capability. Because of these conditions, determining whether a radiological release has occurred can take a significant about of time, substantially delaying the event response.

c. Efforts to ensure that personnel knew they had on-call duty were inadequate. The on-call RadCon support person who was contacted in the wake of the WIPP radiological release was not aware of being on call that night because that person had transferred to another organization. RadCon management was unclear in communicating its expectations to this individual.

d. Although NWP procedures provide for contacting an individual for on-call RadCon support, there were no provisions for mobilizing an appropriate number of RadCon personnel to respond to a radiological event. NWP personnel indicated during interviews that they encountered significant difficulty in contacting additional RadCon support in the wake of the WIPP radiological release.

2. NWP did not ensure that WIPP personnel had the expertise and experience to administer an incident response bioassay. As stated in Section 8.1.3, Dosimetry Program, of the AIB report on the WIPP radiological release, "internal dosimetry decisions did not originate from WIPP Radiological Control, but from URS [URS (formerly United Research Services) Energy and Construction, Inc., one of the NWP partners] corporate reach-back expertise" because of this lack of expertise and experience.

3. NWP management did not ensure proper initial qualification of the cognizant engineers on their systems and did not ensure that they maintained current knowledge of their system and the changes in equipment and operations. As a result, in-depth knowledge of systems and associated system design documents used in developing the safety basis documentation for WIPP, such as the DSA, was not given adequate priority. The cognizant engineers for the U/G ventilation system were, therefore, not aware of the design leakage past the HEPA filter bypass dampers or the fact that this could be a source of the airborne contamination observed on February 15, 2014.

Collectively, these noncompliances constitute a Severity Level II violation.

F. Training

Title 10 C.F.R. § 830.122(b), *Criterion 2 - Management/Personnel Training and Qualification*, states that contractors must "(1) [t]rain and qualify personnel to be capable of performing their assigned work" and "(2) [p]rovide continuing training to personnel to maintain their job proficiency."

Title 10 C.F.R. § 835.901, *Radiation safety training*, provides requirements to complete training in radiation safety topics described 10 C.F.R. § 835.901(c) and to demonstrate knowledge of those topics.

NWP implements training requirements in WP 13-1, *Quality Assurance Program Description*, Section 1.2, Personnel Qualification and Training, and in procedure WP 14-TR.-1, *WIPP Training Program*. Section 1.2.2.A. of WP 13-1 states that NWP management shall "[e]nsure that personnel are indoctrinated and trained, including on-the-job training as needed, to achieve initial proficiency; maintain proficiency; and adapt to changes in hazard conditions, technology, methods, job responsibilities and authority, and quality assurance requirements identified in implementing procedures prior to performing assigned tasks."

Contrary to the above requirements, the NWP training program was not adequate to prepare its personnel to perform their assigned duties. Specific examples include the following:

1. According to key NWP operations personnel, the training they received did not include information about the potential leakage of U/G ventilation exhaust past the HEPA filter bypass isolation dampers. As a result, NWP operations personnel used faulty information as the basis for important decisions on the nature and timing of event response and protective actions. NWP personnel emphasized that their understanding of WIPP systems assured them that all U/G ventilation exhaust was passing through the U/G effluent HEPA filters and, therefore, that airborne contamination would not be released above ground as long as the integrity of these HEPA filters was maintained.

2. Cognizant engineers for WIPP systems did not receive adequate initial training on their systems, and only limited time was available for continuing training while they were engaged in supporting waste emplacement operations. As a result, NWP engineers were not able to identify the possibility of U/G ventilation exhaust leaking past the HEPA filter bypass isolation dampers until they were able to access design archives many days later in the offsite WIPP offices in downtown Carlsbad, New Mexico, about 35 miles away from the WIPP site.

3. NWP personnel received inadequate training on event response and emergency planning. As described in the AIB report for the radiological release, exercises did not closely simulate the situations they were likely to encounter during an event and were not adequately detailed. Thus, when developing a response to the radiological release, NWP personnel had to improvise plans for key features of their response.

Collectively, these noncompliances constitute a Severity Level II violation.

G. Work Processes – Waste Characterization and Acceptance

Title 10 C.F.R. § 830.122(e), *Criterion 5 - Performance/Work Processes*, paragraph (1) requires contractors to "[p]erform work consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means."

NWP's work processes for meeting waste characterization requirements are documented in CCP-PO-001, Revision 21, *CCP* [Central Characterization Project] *Transuranic Waste Characterization Quality Assurance Project Plan* (QAPjP). Section A-2, Scope, states that "[t]his QAPjP specifies quality requirements, management activities, and procedures necessary to meet the specific data quality objectives (DQOs) for TRU waste characterization."

In addition to the work process deficiencies identified in section II. C and II. D of this report, the investigation identified unique deficiencies in NWP's work processes for WIPP waste characterization and acceptance activities. This investigation carefully considered the respective roles and responsibilities of NWP and Los Alamos National Security, LLC (LANS), the contractor at Los Alamos National Laboratory (LANL), with respect to waste characterization and acceptance activities. LANS and NWP, the contractor for the CCP organization, work closely together on these activities in support of disposal of TRU waste from LANL at WIPP. The scope of responsibility for LANS and NWP activities is described in detail in two documents, PBS VL-LANL-0013, *Statement of Work for Characterization of LANL TRU Waste (Contact Handled and Remote Handled)*, and CCP-PO-012, *CCP/Los Alamos National Laboratory (LANL) Interface Document*. The DOE Office of Enforcement conducted a separate investigation into potential violations by LANS with respect to the radiological release of February 14, 2014.

Examples of NWP work process deficiencies for the WIPP waste characterization and acceptance activities include:

1. The QAPjP, Section C-1c, Waste Prohibited at the WIPP Facility, prohibits certain TRU wastes from being accepted for disposal at WIPP, including wastes exhibiting the characteristics of ignitability, corrosivity, or reactivity. Contrary to this prohibition, one or more TRU waste drums from LANL containing reactive contents was disposed of at WIPP, as revealed by the failure of at least one of these drums and the subsequent radiological release at WIPP on February 14, 2014.

2. The QAPjP, Section C4-2b, Required TRU Waste Stream Information, states that "[a]t a minimum, the waste process information on each waste stream includes the following written information…events or processes that may have modified the chemical or physical properties of the waste stream after generation." The QAPjP, Section C4-2c, Additional Acceptable Knowledge Information, states that "CCP shall obtain additional acceptable knowledge information. CCP shall collect information as appropriate to augment required information and provide any other information obtained to further delineate the waste stream." One example provided in this section is "[s]tandard

operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of wastes generated and how the wastes are managed at the point of generation."

Contrary to these requirements, NWP did not obtain the minimum waste process information required by Section C4-2b of the QAPjP or the additional acceptable knowledge information described in Section C4-2c of the QAPjP, with respect to waste stream LA-MIN02-V.001, prior to shipment to WIPP. This waste stream was processed according to LANL glovebox operations procedure EP-WCRR-WO-DOP-0233, which introduced organic materials into the waste stream as an absorbent. However, the acceptable knowledge document developed by NWP (i.e., CCP-AK-LANL-006) stated that waste stream LA-MIN02-V.001 was being remediated/repackaged with an "inert absorbent material (e.g., zeolite, kitty litter)," reflecting a significant discrepancy between NWP documentation and LANL procedures and operations. Although LANL failed to formally notify CCP of the transition to an organic absorbent material, contrary to the terms of its working relationship with CCP as described in formal documents, NWP should have known of this change through normal oversight of waste characterization activities and reflected it in relevant documentation.

Collectively, these noncompliances constitute a Severity Level I violation.

III. REPLY

Pursuant to 10 C.F.R. § 851.42(b)(4) and 10 C.F.R. § 820.24(b), NWP 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" and must be signed by the person filing it.

If NWP chooses not to contest the violations set forth in this PNOV, then the reply should clearly state that NWP 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 NWP disagrees with any aspect of this PNOV, then as applicable and in accordance with 10 C.F.R. § 851.42(c)(1) and 10 C.F.R. § 820.24(c), 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) and 10 C.F.R. § 820.24(c) require 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, MD 20874-1290

A copy of the reply should also be sent to the Manager, CBFO.

Pursuant to 10 C.F.R. § 851.42(d), if NWP fails to submit a written reply within 30 calendar days of receipt of this PNOV, NWP relinquishes any right to appeal any worker safety and health matter in this PNOV and this PNOV will constitute a final order for those matters. Also, pursuant to 10 C.F.R. § 820.33, *Default order*, subsection (a), if NWP fails to submit a written reply within 30 calendar days after the date of filing of this PNOV, the Director of the Office of Enforcement may pursue a Default Order for any nuclear safety matter in this PNOV.

IV. 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.

Steven C. Simonson
Director
Office of Enforcement
Office of Enterprise Assessments

Washington, D.C.
This 18th day of February 2016