Independent Assessment of Work Planning and Control for Explosives Operations at the Pantex Plant

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Table of Contents

Acronyms ii

Executive Summary iii

1.0 Introduction 1

2.0 Methodology 1

3.0 Results 2

3.1 Work Planning and Control Institutional Programs 2

3.2 Work Planning and Control Implementation 4

3.3 Contractor Assurance System/Feedback and Improvement 9

3.4 Federal Oversight 12

3.5 Follow-up on Previous EA Findings 14

4.0 Best Practices 15

5.0 Findings 15

6.0 Deficiencies 16

7.0 Opportunities for Improvement 16

Appendix A: Supplemental Information A-1

Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
CAS	Contractor Assurance System
CFR	Code of Federal Regulations
CRAD	Criteria and Review Approach Document
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
ECP	Employee Concerns Program
ES&H	Environment, Safety, and Health
ExT	Explosives Technology
FR	Facility Representative
IH	Industrial Hygiene
ISM	Integrated Safety Management
M&O	Management and Operating
NFPA	National Fire Protection Association
NNSA	National Nuclear Security Administration
OFI	Opportunity for Improvement
OPEX	Operating Experience
Pantex	Pantex Plant
PFO	Pantex Field Office
PHA	Process Hazards Analysis
PXD	PanTeXas Deterrence, LLC
RMA	Radioactive Material Area
SME	Subject Matter Expert
TLHA	Task Level Hazard Analysis
TLV	Threshold Limit Value
TOPIC	Tools for Opportunities – Improvement and Communication
TQP	Technical Qualification Program
WP&C	Work Planning and Control

INDEPENDENT ASSESSMENT OF WORK PLANNING AND CONTROL FOR EXPLOSIVES OPERATIONS AT THE PANTEX PLANT

Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent assessment of work planning and control of elements of explosives operations at the Pantex Plant from October to December 2024 at the request of the Pantex Field Office (PFO) Manager. The assessment evaluated PanTeXas Deterrence, LLC's (PXD's) implementation of the integrated safety management (ISM) core functions (define scope of work, identify and analyze hazards, identify and implement controls, perform work safely within controls, and feedback and improvement) related to explosives operations, the effectiveness of PXD's contractor assurance system, and the effectiveness of PFO oversight of PXD's explosives work.

EA identified the following strengths, including two best practices:

- The PXD industrial hygiene (IH) hazard and exposure assessment processes for explosives operations work are consistent with the guidance provided by the American Industrial Hygiene Association and are exemplary tools for evaluating potential chemical, biological, and physical hazards. These practices are not typical within the DOE complex. (Best Practice)
- PXD has established a human factors engineering team, which consists of a psychologist, chiropractor, kinesiologist, and other safety and health professionals as needed, to review ongoing and planned work to identify and eliminate workplace hazards and improve working conditions. (Best Practice)
- Most observed PXD explosive work activities are well established and documented in detailed operating procedures, manuals, and work instructions sufficient to support the observed operations, which included explosives pressing, testing, handling, storing, transporting, and disposal.

EA also identified several weaknesses, including two findings, as summarized below:

- PXD has not provided adequate instructions for performing and documenting task level hazard analyses for explosives operations and explosives movement. (Finding)
- During three observed evolutions, PXD either did not perform work steps as stated in the governing procedure, or the procedural work steps were unclear, or acceptance criteria were not defined. (Finding)
- Several required elements of pre-job briefings, including a daily discussion of job hazards, hazard controls, and permits, are not performed as required by the PXD institutional-level ISM program.
- PXD has not incorporated the 2016 American Conference of Governmental Industrial Hygienists threshold limit values for ergonomics into its industrial safety or IH manuals and worksheets.
- Some observed hazards and controls were not adequately identified in operating procedures (e.g., ergonomic, radiological, illumination, and lifting hazards).
- PXD does not ensure that appropriate labels and signs alerting workers to hazards are posted and maintained on equipment and structures, as required.
- PXD did not ensure that hazard controls for six observed facility systems and/or facility areas were adequate to mitigate hazards or warn workers of potential hazards.

In summary, PXD's work instructions, and operational procedures adequately outline the ISM core functions and support the safe performance of work, and PFO effectively conducts oversight of work at the Pantex Plant. Facility pre-day checks are performed in accordance with documented procedures and

checklists. The IH hazard and exposure assessment processes and human factors engineering team were identified as best practices. However, institutional programs do not provide sufficient information to guide staff in the development of task level hazard analyses. Some workers did not perform work steps as prescribed in procedures, and some procedures did not have clear work steps or include acceptance criteria for required checks. Until the concerns identified in this report are addressed or effective mitigations are put in place, unidentified and uncontrolled hazards pose an increased risk to workers conducting explosives operations at the Pantex Plant.

INDEPENDENT ASSESSMENT OF WORK PLANNING AND CONTROL FOR EXPLOSIVES OPERATIONS AT THE PANTEX PLANT

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Worker Safety and Health Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of work planning and control (WP&C) for explosives operations at the Pantex Plant (Pantex). Pantex develops, formulates, fabricates and tests high explosive components. NNSA selected Pantex as the High Explosive Center of Excellence for manufacturing high explosives. Pantex is managed and operated by PanTeXas Deterrence, LLC (PXD)[1] for the National Nuclear Security Administration (NNSA) and is overseen by the Pantex Field Office (PFO)[2]. Explosives operations are performed by PXD's Explosives Technology (ExT), Production, Operations, and Environment Safety and Health (ES&H) organizations. This assessment was requested by the PFO Manager and was conducted from October to December 2024.

In accordance with the *Plan for the Independent Assessment of Work Planning and Control of Explosives Operations at Pantex, November - December 2024*, this assessment evaluated PXD's established WP&C processes and implementation of the five core functions of integrated safety management (ISM). DOE's ISM policy defines the following five core functions to ensure systematic and effective WP&C: define the scope of work, identify and analyze hazards, develop and implement hazard controls, perform work within controls, and provide feedback and improvement. The assessment also evaluated the contractor assurance system (CAS) and the Federal oversight provided by PFO.

2.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*, which EA implements through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. This report uses the terms "best practices, deficiencies, findings, and opportunities for improvement (OFIs)" as defined in the order.

As identified in the assessment plan, this assessment considered objectives and criteria from DOE Guide 226.1-2A, *Federal Line Management Oversight of Department of Energy Nuclear Facilities*, appendix D, *Activity Level Work Planning and Control Criterion Review and Approach Documents with Lines of Inquiry*. EA also used elements of CRAD EA-30-07, Revision 0, *Federal Line Management Oversight Processes*, to collect and analyze data on PFO oversight activities related to WP&C. In addition, EA used selected objectives and criteria from the following EA CRADs:

- EA-30-01, Rev. 1, *Contractor Assurance System*
- EA-32-01, Rev. 1, *Explosives Safety*
- EA-32-03, Rev. 1, *Industrial Hygiene Program*
- EA-32-12, Rev. 0, *Material Handling Safety*
- EA-32-13, Rev. 1, *Electrical Safety*.

[1] PXD became the management and operating (M&O) contractor at Pantex on November 1, 2024.
[2] In April 2024, NNSA established two new field offices, PFO, to oversee operations at Pantex and Y-12 Field Office (YFO) to oversee operations at the Y-12 National Security Complex (Y-12). Prior to April 2024, the NNSA Production Office was responsible for oversight of Pantex and Y-12. In March 2024, PFO and YFO entered a mutual support agreement to provide services to one another and to work cooperatively for solutions that complement the expertise and skills in the respective offices. YFO provided limited oversight and programmatic support to PFO in certain functional areas.

EA examined key documents, such as manuals, programs, policies, operating procedures, work instructions, checklists, industrial hygiene (IH) exposure assessments, performance self-assessments, and training and qualification records. EA also interviewed key personnel responsible for developing and executing the associated programs; observed 31 operational activities with respect to explosives pressing, testing, handling, storing, transporting, and disposal; and walked down significant portions of selected Pantex facilities where explosives operations are conducted. The members of the assessment team, the Quality Review Board, and the management responsible for this assessment are listed in appendix A.

EA conducted a previous assessment of WP&C at Pantex in 2018, as documented in EA report *Office of Enterprise Assessments Assessment of the Pantex Plant Work Planning and Control Program, June 2018*. The current assessment examined the completion and effectiveness of corrective actions for the EA finding identified in the previous assessment. Results of the corrective action review are included in section 3.5 of this report.

3.0 RESULTS

3.1 Work Planning and Control Institutional Programs

This portion of the assessment evaluated PXD's WP&C processes that support the safe performance of work involving explosives operations in accordance with DOE's ISM requirements.

PXD has developed an adequate WP&C framework to support implementation of the core functions of ISM in accordance with DOE Acquisition Regulation (DEAR) 970.5223-1, *Integration of environment, safety and health into work planning and execution*. Program document E-SD-2009, *Integrated Safety Management Program, Incorporating Worker Safety and Health Program Requirements*, appropriately describes PXD's integrated work management processes for WP&C and provides an electronically linked ISM/worker safety and health (WSH) program crosswalk of DEAR 970.5223-1 and 10 CFR 851, *Worker Safety and Health Program*, requirements to relevant PXD implementing documents. This ISM/WSH program was adopted from the previous Pantex management and operating (M&O) contractor on November 1, 2024, and was approved by PFO in accordance with 10 CFR 851.11, *Development and approval of worker safety and health program*.

PXD has established a generally adequate hazard identification and work control process. MNL-00055, *Pantex Non-Nuclear Facilities Safety System Manual*, appropriately identifies facility safety systems for each building managed by ExT, Production, Operations, and ES&H. A suite of procedures governs the development of process hazards analyses (PHAs) to document potential hazards for explosives operations conducted within a building. Task level hazard analyses (TLHAs), which are included as an appendix to most explosives-operation procedures, summarize safety and health hazards for the work activity described in the procedures. LIST-0081, *List of Hazardous Processes Requiring a Hazard Analysis*, identifies individual facilities and operations within those facilities that require a hazards analysis. Individual facility pre-operational checks are performed by authorized technicians at the beginning of each day before each shift to ensure that work is ready for release by the Facility Manager. Each facility starts the day with a standup meeting with facility workers and finishes the day with an end-of-shift meeting in accordance with form PX-4457, *Explosive Technology Operations Record of Stand-up/End of shift meeting*, that covers such topics as lessons learned, facility status, formality of operations, security, and maintenance/subcontractor work.

PXD's processes for conducting IH hazard assessments and exposure assessments are well-defined in MNL-352231, *Industrial Hygiene Program Manual*. MNL-352231, section 7, provides a systematic IH hazard assessment process for identifying and evaluating potential chemical, biological, or physical

hazards in the workplace that could pose a health risk to employees. The IH hazard assessment process also provides a sound rationale for establishing hazard control measures, a means for prioritizing future exposure monitoring or sampling, and a tool for communicating recognized IH hazards to management and workers. Further, MNL-352231, section 8, provides a useful exposure assessment process for measuring how much of a contaminant can be absorbed by an individual, in what form, at what rate, and how much of the contaminant is available to produce an adverse effect from a specific work task. Notably, all observed facilities and operations had a documented IH hazard assessment and supporting exposure assessments, which is a required but not a well-established practice within the DOE complex. PXD's combined IH hazard assessment and exposure assessment processes and implementation are cited as a **Best Practice** because the processes are exemplary in identifying and evaluating potential chemical, biological, or physical hazards in the workplace through adoption of the guidance in American Industrial Hygiene Association (AIHA) manual, *A Strategy for Assessing and Managing Occupational Exposures,* and were consistently implemented for observed facilities and operations.

PXD's explosives safety program, MNL-240176, *Department of Energy Explosives Safety Standard Pantex/Lawrence Livermore National Laboratory Version*, is robust, mature, and well-documented. MNL-240176 appropriately addresses developing, manufacturing, handling, storing, transporting, and testing explosives for explosives operations. MNL-240176 effectively implements DOE-STD-1212-2019, Change 1, *Explosives Safety*, which is invoked through DOE Contract 89233224CNA000004, dated November 5, 2024. At the time of the assessment, PXD employed six fully qualified and two nearly qualified explosives safety specialists who perform assessments, facility walkdowns, operating procedure approvals, and other explosives safety activities.

The review and approval process of custom-made electrical equipment suitable for use in explosives operations is adequately defined and strictly controlled to ensure adherence with established procedures and consensus standards. WI 02.02.02.12.04, *Electrical Equipment Safety Evaluation*, specifies a well-defined and thorough electrical engineering review process used to inspect and approve general use and non-listed or non-certified electrical equipment. Final approval is appropriately provided by the local authority having jurisdiction in accordance with the DOE Electrical Safety Handbook and National Electrical Code.

While PXD's WP&C institutional programs associated with explosives operations are generally adequate, the following weaknesses were identified:

- Contrary to 10 CFR 851.21(a)(5) and (6); E-SD-2009, section 6.3, *CF-2 – Identify and Analyze the Hazards*; and MNL-293084, *Pantex Writer's Manual for Technical Procedures*, PXD has not provided adequate instructions for performing and documenting TLHAs for explosives operations and explosives movement. (See **Finding F-PXD-1**.) A lack of sufficient instructions for performing and documenting job task-level hazards analyses could result in the inadequate identification and control of hazards. MNL-293084 provides a minimal template with "general guidance" for a TLHA table in the *Explosive Technology Operating Procedures* section, but includes no instructions for developing, reviewing, documenting, or approving TLHAs or guidance with respect to the purpose, content, and applicability of TLHAs or linkage of hazards and hazard controls in the body of the procedure to the TLHA. Furthermore, MNL-293084 does not provide guidance with respect to the type of work activities that require a TLHA. For example, PXD has not provided guidance for performing and documenting a hazard analysis for explosives movement procedures or determining whether a TLHA would be appropriate for this type of work activity. While DOE-STD-1212-2019, section 8.1, requires a documented hazards analysis for any operation involving explosives, an interviewed PXD official explained that PXD considers explosives movements to be "actions" rather than operations, so no hazards analysis is required. Consequently, P7-3400, *Material Movement Authorization*, does not address any hazards or controls associated with explosives movement, nor has a TLHA been

prepared and included as an appendix to P7-3400. Furthermore, this issue is exacerbated by pre-job briefings that lack a discussion about hazards and controls, as described in the next bullet.

- Contrary to E-SD-2009, section 6.2.d (under GP 1), PXD manual MNL-352156, *Pantex Operations Conduct of Operations Manual*, section 2.2.2.3, does not require daily pre-job briefings to ensure that all workers understand the expectation related to safety and health, the governing work controls, and the means by which workers can safely and successfully perform their assignments. (See **Deficiency D-PXD-1**.) Not addressing task-level hazards and controls during a daily pre-job briefing could result in the worker's lack of understanding of the hazards and required controls and does not allow for the opportunity for workers to express feedback if the work can be performed in accordance with the applicable procedure. E-SD-2009, section 6.2.d (under GP 1), prescribes that daily pre-job briefings are to be used to assure workers understand expectations related to safety and health and the governing work controls. Furthermore, E-SD-2009, section 6.4.3, states that during pre-job briefs, "work procedures or instructions, results of hazard analyses, and the required permits and controls necessary to the job are reviewed with the worker." However, MNL-352156 only requires at a minimum that pre-job briefings discuss new work, tasks that have not been performed recently, and jobs where the governing procedure has changed, but includes no requirement to discuss job hazards, controls, or permits. None of the observed stand-up meetings in Buildings 11-5 and 11-61 included a discussion of job hazards, controls, or permits, as required by E-SD-2009.
- Contrary to 10 CFR 851.23(a)(9), PXD has not incorporated the 2016 American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit values (TLVs) for ergonomics into the PXD industrial safety or IH manuals and worksheets. (See **Deficiency D-PXD-2**.) Without incorporating the current ACGIH TLVs, workers could be exposed to ergonomic hazards that exceed DOE limits. The ergonomics section of the 2016 *ACGIH Manual on Threshold Limit Values for Chemical Substances and Physical Agents* identifies TLVs for hand activity, lifting, and hand-arm and whole-body vibration. These TLVs and processes for determining whether a work activity is within the established TLVs have not been documented in PXD manuals and worksheets. MNL-352253, *Pantex Safety Program*, section 7.5, which describes the PXD ergonomic program, focuses on identifying the need for an ergonomic evaluation and ergonomic controls but does not address how the TLVs are to be implemented. Similarly, form PX-6212, *Ergonomic Worksheet*, lacks instructions with respect to evaluating the TLVs.

Work Planning and Control Institutional Programs Conclusions

With the exception of the TLHA process, PXD has developed an adequate WP&C framework to support implementation of the core functions of ISM, including generally adequate processes for hazard identification and work control, IH hazard assessments and exposure assessments, explosives safety, and review and approval of custom-made electrical equipment. PXD's combined IH hazard assessment and exposure assessment processes and implementation are considered a best practice. However, weaknesses were identified in the areas of performing and documenting TLHAs for explosives operations and explosives movement, conducting pre-job briefings, and adopting the 2016 ACGIH TLVs for ergonomics.

3.2 Work Planning and Control Implementation

This portion of the assessment evaluated PXD's implementation of WP&C institutional programs for explosives operations through the ISM core functions of defining the scope of work, identifying and analyzing hazards, developing and implementing hazard controls, and performing work within controls (providing feedback and making improvements is addressed in section 3.3 of this report).

Defining the Scope of Work

The work scopes for observed explosives operations were well-documented in operating and technical procedures, engineering data sheets, and work instructions. For example:

- Component pressing activities in Building 11-61 were well-defined in operating procedure P80-0120-1, *W80 Isostatic Main Charge Pressing HEPF*, and P6-6112, *Isostatic Component Pressing-EPSI Carpenter Press*. Parameters for performing the pressing operations were also detailed on form PX-834, *Pressing Requests*, associated with these activities. Form PX-6200, *Safety System Check Sheet, Building 11-61 Bay 4 and Bay 6 Presses*, included detailed steps to perform safety system checks before the start of operations in each shift.
- Observed explosives testing operations in Building 11-5 were step-by-step and sufficiently detailed in operating procedure P6-0522, *Building 11-5 Impact Sensitivity Tests*. The explosives compression test data sheet provided sufficient experiment-specific requirements to ensure that the work scope was adequately bounded and controlled.
- Observed work activities and work scopes at the Firing Site and Burning Grounds were well defined in operating procedures and work instructions.

Identifying and Analyzing Hazards

For observed work, most hazards were adequately identified and analyzed through the engagement of subject matter experts (SMEs) during the initial review of new procedures and subsequent changes. ES&H and Engineering SMEs in, for example, Safety, IH, and Explosives Safety are involved in the review of operating procedures and subsequent changes. In particular:

- Explosives hazards were sufficiently identified, analyzed, and documented in PHAs prepared for the buildings in which work activities were observed. HA-PHA-942096, *Building 11-61 High Explosives Pressing Facility Process Hazard Analysis*, adequately addressed potential hazard scenarios and corresponding mitigating controls for several observed pressing operation tasks. In addition, the PHA for Building 11-5 adequately described the observed operation and potential hazards of mechanical testing of an explosives sample in the environmental chamber of the universal test machine.
- Reviewed IH hazard assessments and supporting exposure assessments performed in accordance with MNL-352231 effectively identified and analyzed worker exposure hazards associated with observed work activities. For example, hazard assessment #00282, *Industrial Hygiene Hazard Assessment*, for Building 11-61 identified seven tasks that presented a potential exposure hazard to workers. Each task further identified one or more specific hazards. An exposure assessment (qualitative or quantitative) was conducted for each of the hazards, and applicable administrative, engineering, or personal protective equipment controls were appropriately identified.

While most hazards were adequately identified and analyzed, the following weaknesses were observed:

- Contrary to 10 CFR 851.21(a)(5) and (6) and E-SD-2009, section 6.4.3, during three work observations, PXD did not define ergonomic, radiological, illumination, and lifting hazards in operating procedures or convey the hazards to workers in a pre-job briefing. (See **Deficiency D-PXD-3**.) Not adequately identifying and analyzing work task-level hazards could increase the risk of injury or illness to workers. Specifically:
    - The operating procedure P6-0120-1, *Dual Stack Pressing of Universal Hemisphere Charges*, appendix III TLHA did not address the ergonomic hazards of removing the baseplate from a pressed explosive. P6-0120-1 requires the manipulation or extraction of the baseplate from a pressed explosive in Building 11-61, resulting in repetitive use of a worker's hand as an extruding device, because, according to interviewed workers, no tools have been approved to perform this

operation. An ergonomic evaluation of this work activity, which presents a stress to a worker's wrist, has not been conducted.

- The radiological hazards associated with entering a radioactive material area (RMA) area at Zone 4, Area D, Magazine 62 were not identified in explosives movement and storage procedures or discussed with EA prior to entry. Furthermore, the radiological hazard identification and control procedures associated with entering an RMA that are referenced in MNL-RS0001, *Pantex Radiological Control Manual*, were not specifically identified in explosives movement and storage procedures, contrary to MNL-00040, *Pantex Plant Conduct of Operations Manual*, section 16.3.2.4. Also, during the same work observation, potential illumination hazards inside Magazine 62 were not identified in operating procedures for the movement and storage of explosive materials, nor has the illumination hazard been assessed by IH to ensure that the minimum illumination requirement of 3 foot-candles for an active storage area as specified in MNL-352231, section 22, has been met.
- Operating procedure P6-6112 addresses safety requirements in Building 11-61, such as lifting operations requiring the use of hoists, but the appendix VIII TLHA does not address the potential hazards and mitigating controls associated with the use of hoisting equipment.

Developing and Implementing Hazard Controls

Hazard controls documented in reviewed explosives-operation procedures were generally detailed and appropriate for mitigating or controlling identified hazards. For most of the reviewed explosives-operation procedures, hazard controls were sufficiently defined in the safety requirements, general instructions, and operations sections of the procedures. For example:

- For the explosives pressing operation observed in Building 11-61, the hazard controls of the process were well-described in a step-by-step operating procedure (P80-0120-1), with specific hazard controls for the press operation well-defined in a separate operating instruction (P6-6112).
- During the observed test firing at Building FS-24, the safe/arm key to the firing control panel was maintained in strict control by setup personnel during explosive shot preparation until the shot was ready, at which time the key was passed to the lead operator in accordance with DI-24-016, *ACT Test Fire*. This key control procedure ensures that the firing circuit cannot be energized until the setup is complete and the explosives are placed inside the chamber.

Most observed administrative and engineering controls were well-developed, documented, and effective in mitigating or controlling identified hazards. For example, the local exhaust ventilation system in Bay 2 of Building 11-61 was effectively used when explosive powders were being dispensed into a pressing crucible. The ventilation system had been tested by IH during the past six months, as required by MNL-352231, section 30, and the testing data was documented and readily available for review. Also, observed administrative and engineering controls for the earth-covered Zone 4 explosives storage magazines were adequate to ensure that explosives were stored safely and securely. The magazines were clean, well-maintained, and designed with aisles wide enough to accommodate inspection and inventory in accordance with MNL-240176, section 32.2.7. Each magazine was equipped with two exterior properly rated fire extinguishers, exhibited vegetation free soil more than 50 feet around the perimeter, and was placarded with appropriate explosive limits near the magazine door in accordance with DOE-STD-1212-2019, sections 32.1.2 through 32.1.4.

Access controls to explosives-operation sites during explosives operations were well-engineered and adequately implemented. For example, the explosives waste disposal site blocked pedestrian access to the burn pads by using a drop-down barrier with a flashing light that notified personnel in the area that explosives operations were underway. Building 11-61 exhibited proper access controls, with personnel

and explosives limits posted outside of designated bays in accordance with F6-5061, *Building 11-61, 11-61A1, 11-61-A2 - Specific Safety Requirements*, step 34, and DOE-STD-1212-2019, section 14.3.1.1. Building 11-5 uses a personnel access barrier chain that, when used to restrict personnel movement, electronically activates a red rotating light to visibly indicate that explosives testing is underway.

While most hazard controls were well-documented and adequately implemented, the following weaknesses were identified:

- Contrary to the requirements specified below, the following equipment labeling and facility signage were observed to be inadequate during two work activities. (See **Deficiency D-PXD-4**.) Inadequate equipment labeling or facility signage could result in workers being inadvertently exposed to workplace hazards. Specifically:
    - In Building 11-61, some observed electrical equipment (e.g., switchboards and safety switches) that requires examination, adjustment, servicing, or maintenance was not provided with arc flash and shock protection labeling, as required by National Fire Protection Association (NFPA) 70E, *Standard for Electrical Safety in the Workplace*, article 110.16.
    - Zone 4, Area D, Magazine 62 was identified as an RMA, but the RMA posting sign on the exterior of the magazine was faded and could not be read at distances greater than 12 inches. This condition resulted in workers inadvertently entering the magazine without the appropriate dosimetry required by the RMA posting, contrary to 10 CFR 835.601(b) and 605, *Labeling items and containers*. PXD conducted an extent-of-condition review and determined that similar conditions existed at other magazines that are designated RMAs.
- Contrary to the requirements specified below, hazard controls for six observed facility systems and/or facility areas were not adequate to mitigate hazards or warn workers of potential hazards. (See **Deficiency D-PXD-5**.) Inappropriate hazard controls or a lack of hazard controls could increase the risk of injury to workers. Specifically:
    - Hazard controls for liquid nitrogen systems in Building 11-5 (e.g., oxygen monitors) were not included in the daily pre-operational check of safety systems. In addition, there was no administrative control to ensure that the liquid nitrogen systems are de-energized at the end of the day.
    - The chemical fume laboratory hood in Building FS-11A, Bay 1, lacked sash markings to indicate the working level (baseline) for the hood to ensure consistency with the tested hood face velocity, contrary to MNL-352231, section 30.4.5.
    - The eyewash bottle in Building FS-1 was locally marked with a 2026 expiration date, but the service life of the bottle had already expired earlier in 2024 according to the manufacturer's label.
    - The battery rooms in Building 11-61 did not meet NFPA 70E, article 320, requirements for proper signage to inform and protect personnel from potential hazards.
    - Floor openings at fixed ladder access points in Building 11-61, Bays 4 and 6 press pits, were not adequately protected with a guardrail system or equivalent, contrary to 29 CFR 1910.28(b)(1)(i)(A).
    - During an observed pre-operational walkdown of Building 11-5, the liquid nitrogen system vacuum pressure was recorded as being above the acceptable pressure limit established for the system. Based on a review of previous pre-operational checks, it was discovered that the liquid nitrogen system vacuum pressure had been above the acceptable pressure limit for several weeks. There was a written record of the condition being recorded in the pre-operational checks, but the issue was not raised to be appropriately addressed. This performance is contrary to MNL-00040, section 2.3.6, *Response to Indications*.

- During a work observation at the Burning Ground, procedure P7-0895, *Burning ground waste treatment operating procedure*, required workers to ensure that they were positioned upwind from the burn trays during ash removal operations. However, there was no physical mechanism, such as a windsock, to determine wind direction. (See **OFI-PXD-1**.) During the same work observation, it was observed that work steps in procedure P7-0895 did not adequately address the importance of pausing work and notifying supervision if unconsumed explosives were identified during the process of ash collection. (See **OFI-PXD-2**.)
- In Building FS-11, Bay 2, components with flammable gas (rated class 2) were packaged in metal drums that were modified with a small pressure relief plug. MNL-294103, *Packaging and Container Engineering Manual*, section 2.11.2, allows "Packaging Engineers and Container Engineers to utilize experience and engineering judgment to develop a package configuration that will adequately protect the quality and structure of the contents." Although the metal drum conforms to drawing DWG NO: 730020 SUFFIX: PARA 1, Issue D, PXD has not identified documentation of an analysis performed by either PXD or the container manufacturer to support this lid modification. (See **OFI-PXD-3**.)

Performing Work Within Controls

Most observed work was performed without incident, following hazard controls and established requirements. For example, the hazard controls described in the safety requirements, general instructions, and operations sections of procedure P6-1768, *Mechanical Properties Core Surveillance*, were adequately implemented during the mechanical compression of small quantities of explosive materials observed at Building 11-5.

Further, pre-operational checks of safety systems and facility operational readiness were appropriately conducted daily and before performing work within buildings. For instance, daily pre-operational readiness verification of administrative and process systems observed at Building 11-61 included proper verification of logbooks and status of operating procedures, facility status board actions, operability of safety systems, and a general building walkthrough. In addition, prior to commencing with explosives pressing operations, a safety system check of the pressing machine and associated warning and interlock systems was performed.

Observed onsite movement and handling of explosives to and from magazines were performed safely within controls. For example, prior to a transport vehicle arriving at the magazine with a load of explosive material, the explosives handlers at the magazine closed the magazine door and provided a spotter for the reversing vehicle, as required by MNL-240176, section 33.1.4.1. Also, explosives transport vehicles were properly equipped with the correct type and quantity of fire extinguishers, placards on all four sides of the vehicles, and secure tie-down straps.

Although most observed work was performed safely and within established hazard controls, the following weaknesses were identified.

- Contrary to DOE Order 422.1, attachment 2, section 2.p, and MNL-00040, sections 16.3.2.4 and 16.3.4.5, during three observed evolutions, PXD either did not perform work steps as stated in the governing procedure, or the procedural work steps were unclear, or acceptance criteria were not defined. (See **Finding F-PXD-2**.) Not following prescribed work instructions or pausing/stopping work when work instructions are unclear, ambiguous, or cannot be followed as written, could increase workers' risk of injury or illness. Specifically:
    - During the performance of a burn operation at the Burning Ground, three steps in procedure P7-0895 were not performed as written, nor was work stopped/paused, contrary to MNL-00040, sections 16.3.4.5 and 16.3.4.8, which state that work should be paused or stopped when a "procedure cannot be followed," or "problems or errors in the procedure are discovered." Work was not paused or stopped during these examples. Contrary to P7-0895, step 15.1.3, workers did

not use field glasses to verify the absence of visible flames or smoke after the burn. Also, contrary to step 2.3, workers used polyvinyl chloride (PVC) gloves instead of nitrile or butyl gloves when sorting potentially wetted explosives on the burning trays. In addition, contrary to step 2.6, safety glasses, although worn, were temporarily raised when observing explosives through the BG-2 periscope.

- At the FS-24 firing site bay, contrary to MNL-352259, *Personal Protective Equipment and Respiratory Protection Program*, sections 3.2.1(a)(1) and (5), a technician who was building an explosive component twice removed his eye protection and brought the component with a live detonator within 12 inches of his eyes to verify the correct placement of the detonator.
- PX-6048, *Building 11-61 & 11-61A Pre-Operational Checklist*, step 13, requires the procedure performer to "ensure that the eyewash/shower stations are acceptable for use by inspecting them," but does not provide the acceptance criteria listed in MNL-352253, section 3.4.4. Similarly, PX-6048, step 15, requires the performer to "Verify the scrubber is operational," but does not cite or reference the acceptance criteria documented in the Culligan Water Treatment System manual. MNL-00040, section 16.3.2.4, requires that "acceptance criteria for surveillance or test procedures are easily determined, including tolerances and units," which was not evident in these two examples.

Similar weaknesses were previously identified during the 2018 EA assessment (Finding F-CNS-WPC-1), which identified that during the completion of the daily pre-operational checklist for one building within the Inert Machining Department, workers did not adhere to the procedure compliance requirements of the *Pantex Conduct of Operations Manual* (MNL-00040). See section 3.5 for details.

Work Planning and Control Implementation Conclusions

PXD's implementation of its WP&C institutional programs for explosives operations was generally adequate. The work scopes for observed explosives operations were well-documented, and most hazards were adequately identified and analyzed. Observed administrative and engineering controls were well-developed, documented, and effective in mitigating or controlling identified hazards, and access controls to explosives-operation sites during explosives operations were well-engineered and adequately implemented. Most observed work was performed safely and within established hazard controls. However, weaknesses were identified associated with defining ergonomic, radiological, illumination, and lifting hazards; documenting and implementing hazard controls; providing adequate equipment labeling and facility signage; ensuring the adequacy of hazard controls; and performing work steps as stated in the governing procedure.

3.3 Contractor Assurance System/Feedback and Improvement

This portion of the assessment evaluated PXD's CAS program description, assessments, issues management, and processes for performance feedback and lessons learned to enable the continuous improvement of WP&C.

Contractor Assurance System Program Description

PXD has established an effective CAS. E-SD-2006, *Contractor Assurance Program Description*, was established as required by DOE Contract 89233224CNA000004, dated November 5, 2024, section J, appendices A and B (List of Applicable Directives). The PXD CAS was approved by the PFO Contracting Officer by email on October 23, 2024. The PXD Performance Assurance and Mission Support organizations are appropriately focused on the continuous improvement of processes, assessments, issues management, and performance metrics to support CAS implementation.

Assessments

PXD has established adequate instructions and requirements for performing assessments through E-PROC-3004, *Enterprise Assessments Process*. Reviewed integrated assessment schedules, which were appropriately shared with PFO, demonstrated effective planning among PXD organizations. Three reviewed training records for line management and quality assurance lead assessors demonstrated appropriate formal training in accordance with E-PROC-3004.

PXD and its predecessor have conducted generally adequate independent and management assessments and numerous management work activity observations (floor-time observations). Formal assessments included risk--informed independent assessments and management assessments. In fiscal year 2024, the Performance Assurance organization conducted four independent assessments of ExT; in addition, ExT conducted eight management assessments (self-assessments). All four of the independent assessments and seven of the management assessments appropriately included work observations. An additional reviewed assessment was the last management assessment of the lessons learned program (dated March 30, 2021), which noted an OFI to "improve the feedback mechanism to encourage users to close the loop by documenting how they used the lesson learned and how it benefits them." All 13 reviewed assessments generally demonstrated self-critical evaluations, with identified findings, concerns, and OFIs. However, the 2021 management assessment did not include a review of whether lessons learned were being implemented (e.g., in work control documents). (See **OFI-PXD-4**.)

Further, ExT performed 30,652 floor-time observations in fiscal year 2024. These observations are an effective method of promoting management presence and interaction in the field. Issues and corrective actions are appropriately entered into PXD's issues management system, Tools for Opportunities – Improvement and Communication (TOPIC), for tracking.

Issues Management

PXD processes provide a systematic approach to event and issue analysis, development of corrective actions, and tracking of corrective action status. E-PROC-006, *CNS Issues Management Process*, and E-PROC-007, *Enterprise Event Recovery and Notification Program*, provide generally adequate instructions on managing events, issues, extent-of-condition reviews, causal analysis, corrective action plans, and effectiveness reviews. TOPIC effectively supports tracking of issue/event causal analyses, extent-of-condition reviews, corrective action management, and effectiveness reviews. Three reviewed training records for causal analysts demonstrated appropriate and completed formal training.

Five reviewed Occurrence Reporting and Processing System (ORPS) reports initiated adequate causal analyses determination and corrective action development. An observed issues management board (IMB) meeting demonstrated that the board is made up of experienced staff who use well-established processes to correctly categorize issues and determine need for causal analysis. In two instances, the IMB demonstrated a rigorous approach by requesting causal analysis even though the issue category did not specifically require such action.

The event review team, which reports to the Senior Director of Mission Support, appropriately appoints independent "assigned reviewers" to work with causal analysts, encourage best practices, and ensure adequacy through coaching and engagement. The assigned review team provides additional independent expertise and encouragement for causal analysts. This process is considered noteworthy**,** because it provides a method to enhance uniformity and adequacy of causal analysis across the organization. The event review team and senior staff meeting share functions often assigned to a corrective actions review board (CARB) at other DOE sites. CARBs review significant events and track completion and timeliness of corrective actions. At Pantex, the event review team reviews significant events categorized as level A,

B, or C. The senior staff meeting routinely tracks timeliness, extension, and completion of corrective actions. However, objective evidence of event review team and senior staff meeting actions (e.g., formal meeting minutes) regarding corrective action plans, corrective action due date extensions, and event/issue closure is not documented in TOPIC. (See **OFI-PXD-5**.)

Performance Feedback and Lessons Learned

PXD has generally adequate processes and tools for performance review, feedback and improvement, and sharing of lessons learned. E-SD-2062, *Enterprise Feedback and Improvement Program*, provides generally adequate guidance concerning performance measures, performance analysis, and trending of performance metrics. Periodic performance reviews and reports include weekly CAS metrics, monthly site performance reviews, and quarterly performance reports. Although PXD collects data that could be used as leading and lagging WP&C metrics, it has not identified a specific set of leading and lagging performance metrics for WP&C. (See **OFI-PXD-6**.)

ExT personnel effectively use several documented feedback mechanisms. For example, building pre-operational checklists and safety system check sheets are an effective tool for verifying and documenting facility operating conditions before beginning active operations, documenting non-conformances, and communicating issues to facility management. Similarly, form PX-4457, which is documented and signed by operators and technicians, provides an opportunity to evaluate operations and develop lessons learned, if necessary.

Further, E-PROC-3008, *CNS Lessons Learned Program*, (adopted by PXD until such time as a PXD version is issued) provides adequate instructions on collecting and distributing lessons learned. Applicable DOE operating experience (OPEX) and local lessons learned are appropriately screened and distributed throughout PXD. Two reviewed weekly stand-up safety shares and "Don't Let This Happen to You" bulletins were well-written and easy to understand.

Additionally, E-SD-2020, *Escalation Process*, provides instructions for use at the working-group level of the rolling action item list (RAIL) as an effective tool to capture and track identified issues or concerns that are likely to prevent a group from accomplishing task assignments or addressing work conditions. Items listed and tracked on the RAIL may be entered for information, awareness (for possible escalation), or for appropriate escalation to a higher management level for resolution.

Notably, PXD has established a human factors engineering team, which consists of a psychologist, chiropractor, kinesiologist, and other safety and health professionals as needed. This team appropriately reviews ongoing work as well as planned work to identify and eliminate workplace hazards and improve working conditions. The use of this team is considered a **Best Practice** because it results in the identification and elimination of hazardous conditions before injuries or illnesses occur.

An effective fact-finding meeting was observed on December 4 and 5, 2024, for workers who made an unauthorized entry into an RMA in the Zone 4 Area D Magazine 62 without dosimetry. This issue was appropriately entered into TOPIC. The fact-finding meeting was properly conducted in accordance with E-PROC-007. Four appropriate actions were identified based upon identified gaps in existing conditions.

Contractor Assurance System/Feedback and Improvement Conclusions

PXD has established an effective CAS and has conducted generally adequate independent and management assessments. PXD processes provide a systematic approach to event and issue analysis, development of corrective actions, and tracking of corrective action status. The issues management system effectively supports tracking of issue/event causal analyses, extent-of-condition reviews,

corrective action completion, and effectiveness reviews. PXD has generally adequate processes and tools for performance review, feedback and improvement, and sharing of lessons learned. PXD's human factors engineering team is considered a best practice.

3.4 Federal Oversight

This portion of the assessment evaluated PFO's oversight of WP&C for PXD's explosives operations as well as specific PFO processes and programs, including integrated oversight, issues management, the Facility Representative (FR) program, the technical qualification program (TQP), the OPEX and lessons learned program, and the employee concerns program (ECP).

Oversight

PFO conducts generally effective oversight of PXD and provides information to PXD on its performance. PFO's effective oversight program is implemented through PFO-1.0, *Management Operating Manual*; PFO-3.4.1.1, *PFO Oversight Planning and Implementation Process*; and PFO-1.2.1, *Quality Assurance Program.* PFO-1.0, in conjunction with PFO-1.2.1, adequately documents the ISM program description and quality management system. PFO-3.4.1.1 establishes PFO oversight and risk management processes and documents the PFO oversight system description and processes for conducting system-level oversight, including issues management. PFO uses a risk-based assessment approach in planning oversight to develop a site integrated assessment plan for identified functional areas. The risk value is determined using the risk-rating matrix, which considers the likelihood of consequence criteria based on contractor performance versus severity as well as a "management emphasis factor" assigned by the Executive Leadership Team/Leadership Team based on operational oversight experience. However, PFO-3.4.1.1 does not provide adequate guidance to objectively determine the management emphasis factor in a consistent manner. (See **OFI-PFO-1**.)

PFO managers are required to conduct field time activities at Pantex twice per month. However, contrary to PFO-3.4.1.1, paragraph 5.2, sections a.15, b.5, d.16, e.3, and f.1, field time activities are not documented in the manager field time tracker SharePoint site. (See **Deficiency D-PFO-1**.) When observations gathered during field time activities are not documented, identified issues cannot be tracked and trended. One interviewed manager stated that results for the bi-monthly field time activities cannot be completely documented in the SharePoint site due to field-width limitations. (See **OFI-PFO-2**.)

FRs and Environment, Safety, Health, and Quality SMEs conduct generally effective oversight of PXD and appropriately provide feedback to PXD. Observations from oversight activities are appropriately documented in TOPIC, with responsible action owners identified, and are tracked to completion. Minor issues are appropriately communicated informally via email to PXD for quick resolution. PFO staff members effectively use TOPIC to document and track issues and trend PXD's performance. FRs receive adequate support from SMEs on industrial safety and health subject matters. FRs and SMEs were observed performing the following field oversight:

- Issues identified by the FRs during their walkdown were documented and communicated to PXD for clarification and action, such as exit signs in Building 11-61 that were not illuminated and poor housekeeping in corridors leading to exit access in Building FS-1.
- During oversight of an explosives work activity where RMA access protocols were not adhered to, the SMEs appropriately informed PFO management of the incident and attended PXD's fact-finding meetings.
- During a walkdown of Building 12-5, the SME observed that the fume extraction unit did not have an IH ventilation sticker, and the plumbed eyewash/shower was not regularly flushed/inspected weekly.

The SME brought the issue to the attention of PXD's IH and safety personnel.

PFO appropriately uses oversight metrics captured in weekly reports, semi-annual quality assurance activities plan reports, training status reports, and human resources activities to evaluate the effectiveness of the integration of quality requirements into management and work practices. PFO's assessment of the CAS identified areas of weakness that needed improvement and provided feedback in the annual performance evaluation report to PXD. For example, PXD assessment schedules were not communicated to FRs, which resulted in missed opportunities for FRs to perform shadow assessments.

EA's independent assessment of the occupational injury and illness (OII) recordkeeping and reporting program at Pantex in 2022 identified deficiencies in the M&O contractor's program implementation. The deficiencies were appropriately entered and tracked in TOPIC to closure. Since EA's assessment, PFO has not conducted further oversight of PXD's OII recordkeeping and reporting program to measure the effectiveness of the corrective actions. (See **OFI-PFO-3**.)

Facility Representative Program

PFO has established and implemented an adequate FR program that meets the requirements of DOE-STD-1063-2021, *Facility Representatives*. Procedure PFO-3.4.1.4, *Facility Representative Program*, adequately describes FR duties, responsibilities, and authorities. Reviewed records showed that the FRs are adequately conducting operational awareness assessments that include facility walkdowns, document reviews, meeting observations, field work, control room activity observations, and surveillance requirements.

PFO conducted an FR staffing analysis in November 2024 and the former NPO completed a triennial self-assessment of its FR program (October 2022) in accordance with DOE-STD-1063-2021. The staffing analysis identified a need for 16 FRs; at the time of the assessment, 14 FRs were onboard to cover oversight activities. The staffing analysis also identified 4.8 full-time equivalents needed for explosives operations; at the time of the assessment, 3 FRs were assigned oversight of explosives operations. One explosives operations FR is fully qualified and the other two are in progress, but not overdue, for their qualifications. The triennial self-assessment identified six observations and three noteworthy practices; the observations are being tracked in TOPIC.

Technical Qualification Program

PFO has established and implemented an adequate TQP meeting the requirements of DOE Order 426.1B, *Department of Energy Federal Technical Capabilities*. NPO-2.2.3.1, *Technical Qualification Program*, supplements DOE Order 426.1B and NNSA SD 426.1A, *Technical Qualification Program*, programmatic requirements and guidelines. PFO has an accredited TQP, and its recertification is due this year; PFO is planning to start the recertification process in March 2025. The NNSA self-assessment of the TQP was completed in January 2024, and it identified that all performance criteria of the assessment objectives were met with some weaknesses identified in the implementation of the program. The TQP Manager adequately tracks the status of the staff's qualification in Electronic Technical Qualification Program (eTQP) and generates reports for management awareness.

Lessons Learned and Operating Experience Program

Procedure PFO-4.3.3.1, *Operating Experience (OPEX) Program*, adequately establishes lessons learned and OPEX requirements to help ensure that employees share operational knowledge to improve performance. The Performance Assurance Manager is the designated OPEX Program Coordinator. The OPEX Program Coordinator participates in the monthly OPEX share meeting and communicates

appropriate information to PFO management. PFO shares lessons learned from DOE's OPEX database with PXD so that suggested actions can be considered. PFO staff members appropriately have access to the PXD lessons learned database.

Employee Concerns Program

PFO has established and implemented a generally effective ECP that is implemented through PFO-1.8, *Employee Concerns Program*. PFO performs oversight and conducts assessments of PXD's ECP. The last assessment was conducted in 2023 and was adequately documented. Further, PFO conducts self-assessments of its ECP. The last self-assessment was conducted in 2022 and was adequately documented. New PFO employees stated during interviews that they received information on the ECP during their orientation. Three ECP cases in 2021 and one ECP case in 2022 were reported to PFO and have all been closed. One referral ECP case (NPO-ECP-21-01) was flagged in the database for being prematurely closed without the investigation findings being recorded; the ECP Manager has resolved the identified issue. PFO and PXD sent out a combined annual notification on availability ECP to all employees at Pantex, and PFO published an article about its ECP in the October 2024 Pantex newsletter. Outdated combined (DOE and M&O contractor) ECP posters were posted on the bulletin boards in some buildings; according to the ECP Manager, PXD is in the process of posting updated ECP posters at Pantex.

Federal Oversight Conclusions

Overall, PFO has established appropriate processes and procedures for Federal line oversight, including assessment planning and performance, operational awareness activities, issues management, and performance assurance analysis. Through the oversight mechanisms, PFO effectively communicates oversight issues to PXD during field activities and formally through the issues management and performance evaluation processes. Further, overall, PFO's FR program, TQP, OPEX and lessons learned program, and ECP are adequate. However, a weakness was identified associated with the documentation of manager field time observations.

3.5 Follow-up on Previous EA Findings

This portion of the assessment examined the completion and effectiveness of corrective actions for a previous EA finding documented in *Office of Enterprise Assessments Assessment of the Pantex Plant Work Planning and Control Program, June 2018*.

The 2018 EA assessment cited Finding F-CNS-WPC-1, which identified that during the completion of the daily pre-operational checklist for one building within the Inert Machining Department, workers did not adhere to the procedure compliance requirements of the *Pantex Conduct of Operations Manual* (MNL-00040), the *Explosive Technology Division Operating Procedure* (P6-2003), or section 1.9 of the building 11-50 specific safety requirements procedure. These issues were systemic rather than isolated events because they were evident on different days, at different locations, and involving different personnel. Specifically:

- Workers did not follow the requirements of the *Pre-Operational Procedure Checklist* (F6-5050) as written.
- Workers indicated by signature/initials that a step in the procedure had been verified as complete when the step had not been performed.
- Workers implemented an interpretation of section 3 of the *Pre-Operational Procedure Checklist* to "verify the procedures to be used" that was not supported by shop management.

Corrective actions taken by the prior Pantex M&O contractor included briefing ExT staff members on tools to be used to verify procedures and the method to document procedure verifications (e.g., logbook entries and pre-operational checklists). EA's work observations during the current assessment confirmed that the corrective actions taken to address this finding improved the rigor of the *Pre-Operational Procedure Checklist* process. However, as addressed in Finding F-PXD-2, during three observed evolutions, workers did not follow prescribed work instructions or pause/stop work when work instructions were unclear, ambiguous or could not be followed as written.

Follow-up on Previous EA Findings Conclusions

The prior Pantex M&O contractor closed the previous EA finding based on corrective actions. While these corrective actions resulted in some improvement, they weren't fully effective, as evidenced by Finding F-PXD-2 of the current assessment. EA will continue to evaluate the effectiveness of corrective actions associated with the previous finding as part of a future follow-up to Finding F-PXD-2.

4.0 BEST PRACTICES

Best practices are safety-related practices, techniques, processes, or program attributes observed during an assessment that may merit consideration by other DOE and contractor organizations for implementation. The following best practices were identified as part of this assessment:

- The PXD IH hazard assessment and exposure assessment processes are well-defined in MNL-352231, and the implementation of these processes, as observed in the explosives operations work activities, are exemplary tools for evaluating potential chemical, biological, and physical hazards in the workplace. In addition, both processes are consistent with the guidance provided by the AIHA manual, *A Strategy for Assessing and Managing Occupational Exposures.*
- PXD has established a human factors engineering team, which consists of a psychologist, chiropractor, kinesiologist, and other safety and health professionals as needed, to review ongoing and planned work to identify and eliminate workplace hazards and improve working conditions.

5.0 FINDINGS

Findings are deficiencies that warrant a high level of attention from management. If left uncorrected, findings could adversely affect the DOE mission, the environment, the safety or health of workers and the public, or national security. DOE line management and/or contractor organizations must develop and implement corrective action plans for findings. Cognizant DOE managers must use site- and program-specific issues management processes and systems developed in accordance with DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, to manage the corrective actions and track them to completion.

Finding F-PXD-1: PXD has not provided adequate instructions for performing and documenting TLHAs for explosives operations and explosives movement. (10 CFR 851.21(a)(5) and (6); E-SD-2009, sec. 6.3; and MNL-293084)

Finding F-PXD-2: During three observed evolutions, PXD either did not perform work steps as stated in the governing procedure, or the procedural work steps were unclear, or acceptance criteria were not defined. Work was not stopped or paused during these work evolutions. (DOE Order 422.1, att. 2, sec. 2.p, and MNL-00040, secs. 16.3.2.4 and 16.3.4.5)

6.0 DEFICIENCIES

Deficiencies are inadequacies in the implementation of an applicable requirement or standard. Deficiencies that did not meet the criteria for findings are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

PanTeXas Deterrence, LLC

Deficiency D-PXD-1: PXD manual MNL-352156, section 2.2.2.3, does not require the discussion of job hazards, controls, or permits during daily pre-job briefings for explosives operations. (E-SD-2009, sec. 6.2.d (under GP 1))

Deficiency D-PXD-2: PXD has not incorporated the 2016 ACGIH TLVs for ergonomics into the PXD industrial safety or IH manuals and worksheets. (10 CFR 851.23(a)(9))

Deficiency D-PXD-3: For three observed work activities, PXD did not incorporate the applicable ergonomic, radiological, illumination, and lifting hazards in operating procedures or convey the hazards to workers in a pre-job briefing. (10 CFR 851.21(a)(5) and (6); E-SD-2009, sec. 6.4.3)

Deficiency D-PXD-4: PXD does not ensure that equipment labeling and facility signage intended to warn workers of hazards are adequate and maintained in good condition. (NFPA 70E, article 110.16; 10 CFR 835.601(b) and 605)

Deficiency D-PXD-5: PXD did not ensure that hazard controls for six observed facility systems and/or facility areas were adequate to mitigate hazards or warn workers of potential hazards. (MNL-352231, sec. 30.4.5; NFPA 70E, article 320; 29 CFR 1910.28(b)(1)(i)(A); and MNL-00040, sec. 2.3.6)

Pantex Field Office

Deficiency D-PFO-1: PFO managers do not enter the results of their bi-monthly field time activities in the manager field time tracker SharePoint site. (PFO-3.4.1.1, par. 5.2, secs. a.15, b.5, d.16, e.3, and f.1)

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified the OFIs shown below to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies identified in assessment reports, they may also address other conditions observed during the assessment process. These OFIs are offered only as recommendations for line management consideration; they do not require formal resolution by management through a corrective action process and are not intended to be prescriptive or mandatory. Rather, they are suggestions that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

PanTeXas Deterrence, LLC

OFI-PXD-1: Consider installing a windsock or other wind directional instrumentation near the burn trays at the Burning Ground to communicate prevailing wind direction to workers.

OFI-PXD-2: Consider adding a statement to the note prior to step 1.32 of procedure P7-0895 to indicate that if unconsumed explosives are identified during residual ash collection, work should be paused, and supervision should be notified.

OFI-PXD-3: Consider identifying or performing a documented analysis supporting the use of modified metal drums containing components with flammable gas observed in Building FS-11, Bay 2.

OFI-PXD-4: Consider reviewing whether applicable lessons learned are being implemented (e.g., in work control documents) when conducting future periodic assessments of the lessons learned program. Benchmarking Four Rivers Nuclear Partnership, LLC at the Paducah Gaseous Diffusion Plant and Lawrence Livermore National Laboratory may be useful.

OFI-PXD-5: Consider including objective evidence of event review team and senior staff meeting actions (e.g., formal meeting minutes) regarding corrective action plans, corrective action due date extensions, and event/issue closure in TOPIC. Benchmarking Sandia National Laboratories – New Mexico and Argonne National Laboratory may be useful.

OFI-PXD-6: Consider identifying a specific set of leading and lagging indicators for monitoring WP&C performance. Review of WP&C-related metrics developed by Lawrence Livermore National Laboratory may be useful.

Pantex Field Office

OFI-PFO-1: Consider providing guidelines in PFO-3.4.1.1 to provide a consistent approach to objectively determine the management emphasis factor.

OFI-PFO-2: Consider documenting manager field time activities in TOPIC so that issues can be documented without character count limitations and so they can be tracked and trended to assist with future risk-based oversight activities.

OFI-PFO-3: Consider performing oversight of PXD's OII recordkeeping and reporting program to measure its effectiveness by an SME trained in Occupational Safety and Health Administration (OSHA) recordkeeping requirements.

Appendix A
Supplemental Information

Dates of Assessment

October 17 to December 19, 2024

Office of Enterprise Assessments (EA) Management

John E. Dupuy, Director, Office of Enterprise Assessments
William F. West, Deputy Director, Office of Enterprise Assessments
Kevin G. Kilp, Director, Office of Environment, Safety and Health Assessments
David A. Young, Deputy Director, Office of Environment, Safety and Health Assessments
Thomas E. Sowinski, Director, Office of Nuclear Safety and Environmental Assessments
Kimberly G. Nelson, Director, Office of Worker Safety and Health Assessments
Jack E. Winston, Director, Office of Emergency Management Assessments
Brent L. Jones, Director, Office of Nuclear Engineering and Safety Basis Assessments

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