

**Office of Enterprise Assessments
Assessment of Conduct of Maintenance at the
Waste Isolation Pilot Plant**



June 2016

**Office of Nuclear Safety and Environmental Assessments
Office of Environment, Safety and Health Assessments
Office of Enterprise Assessments
U.S. Department of Energy**

Table of Contents

Acronyms	ii
Executive Summary	iii
1.0 Purpose	1
2.0 Scope	1
3.0 Background	1
4.0 Methodology	1
5.0 Results	2
5.1 WIPP Conduct of Maintenance Program	2
5.2 WIPP Conduct of Maintenance Program Implementation	4
6.0 Findings	6
7.0 Opportunities for Improvement	6
Appendix A: Supplemental Information	A-1
Appendix B: Key Documents Reviewed, Interviews, and Observations	B-1
Appendix C: Deficiencies	C-1

ACRONYMS

A/C	Air Conditioning
ACGLF	Adjustable Center of Gravity Lifting Fixture
CBFO	Carlsbad Field Office
CM	Corrective Maintenance
CRAD	Criteria and Review Approach Document
DOE	U.S. Department of Energy
DSA	Documented Safety Analysis
EA	Office of Enterprise Assessments
EPRI	Electric Power Research Institute
FSM	Facility Shift Manager
FWS	Field Work Supervisor
INPO	Institute of Nuclear Power Operations
LO/TO	Lockout/Tagout
MWO	Model Work Order
NCR	Non-conformance Report
NS	Nuclear Safety Organization
NWP	Nuclear Waste Partnership, LLC
NMMP	Nuclear Maintenance Management Plan
O&M	Operating & Maintenance
OFI	Opportunity for Improvement
PM	Preventive Maintenance
PPE	Personal Protective Equipment
TSR	Technical Safety Requirement
USQ	Unreviewed Safety Question
USQD	Unreviewed Safety Question Determination
WCD	Work Control Document
WIPP	Waste Isolation Pilot Plant
WO	Work Order
WP	WIPP Procedure

EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) Office of Environment, Safety and Health Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the conduct of maintenance program at the Waste Isolation Pilot Plant (WIPP). The purpose of this assessment was to evaluate the effectiveness of selected elements of the conduct of maintenance program and processes used by the contractor, Nuclear Waste Partnership, LLC (NWP).

EA assessed the adequacy of NWP procedures and processes related to the conduct of maintenance program during the offsite periods of the assessment. In addition, EA concentrated on assessing observed maintenance work activities during the March 14-17 and April 11-14, 2016, onsite assessments.

Overall, the conduct of maintenance program has improved over the last 24 months, as reflected in recent NWP assessment reports and improvements in maintenance program procedures developed in response to the *WIPP Recovery Plan for Conduct of Maintenance*. The latest revision of the *WIPP Nuclear Maintenance Management Plan* (NMMP) was recently approved by the DOE Carlsbad Field Office and issued by NWP on April 7, 2016. EA's 2014 finding that NWP had not conducted the required scope of NMMP implementation assessments every three years has been appropriately resolved, and NWP performed comprehensive work planning and control assessments in December 2014 and 2015. The maintenance program implementing procedures appropriately address DOE Order 433.1B requirements and recent revisions demonstrate continuing program improvement. The maintenance work "completed as scheduled" generally exceeded the NWP goal of 80%, and the reasons for "schedule non-delivery" are tracked to identify any trends that must be addressed. NWP recently initiated Phase I of a *Maintenance & Work Control Program Improvement Project Implementation Plan* to address work control performance and effectiveness issues. Efforts are also under way to establish or revise preventive maintenance procedures to ensure compliance with revised safety basis documents once those documents are approved.

Maintenance work performance was generally good with several examples of effective coordination and communication between work groups and excellent demonstrated knowledge of the work being performed. Observed lockout/tagout activities were adequately performed with appropriate arc-flash PPE and establishment of safety barriers for uninvolved personnel. NWP operation and maintenance staff followed the current lockout/tagout procedure, as required. EA observed no significant safety concerns but noted several examples of inattention to detail and inability to implement work control documents as released for performance without appropriate but minor changes.

With few exceptions, workers exhibited a good questioning attitude, appropriately paused work when they identified issues associated with work documents and procedures, and raised issues to supervision for resolution. Some isolated performance deficiencies were identified.

Office of Enterprise Assessments
Assessment of Conduct of Maintenance at the Waste Isolation Pilot Plant

1.0 PURPOSE

The U.S. Department of Energy (DOE) independent Office of Enterprise Assessments (EA) conducted an assessment of conduct of maintenances processes at the Waste Isolation Pilot Plant (WIPP). The purpose of this EA assessment was to evaluate the effectiveness of selected areas of the WIPP conduct of maintenance program.

EA performed this assessment at the WIPP site March 14-17 and April 11-14, 2016. This report discusses the scope, background, methodology, results, and conclusions of the assessment, as well as findings, deficiencies, and opportunities for improvement (OFIs) identified by the assessment team.

2.0 SCOPE

EA assessed the conduct of maintenance program, including management procedures, maintenance scheduling, corrective and preventive maintenance work packages, lockouts and tagouts (LO/TOs), unreviewed safety question (USQ) reviews, and maintenance performance reports. The assessment consisted of an evaluation of the programs, procedures and processes used to demonstrate compliance with applicable sections of DOE Order 433.1B, *Maintenance Management Program for DOE Nuclear Facilities*. The assessment also included observation of maintenance activity scheduling, work release and authorization, pre-job briefings, maintenance work performance, and performance assessments. The criteria that define the scope of this assessment were based on the maintenance program implementation objectives and criteria from EA Criteria and Review Approach Document (CRAD) 45-11, *Safety Systems Inspection Criteria, Approach, and Lines of Inquiry*. The assessment was conducted within the scope defined in the *Plan for The Office of Enterprise Assessments Review of Selected Conduct of Maintenance Processes at the Waste Isolation Pilot Plant*, dated March 2016.

3.0 BACKGROUND

WIPP is located in the Chihuahuan Desert outside Carlsbad, New Mexico, and was established to safely dispose of the nation's defense-related transuranic radioactive waste in a deep mined geological rock salt formation. The DOE Carlsbad Field Office (CBFO) has responsibility for WIPP and the national transuranic program. Nuclear Waste Partnership, LLC (NWP) is the management and operations contractor at WIPP.

This conduct of maintenance assessment is part of a series of assessments established by EA in response to issues identified at WIPP following two emergency events in February 2014.

4.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*. EA implements the independent oversight program through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. Organizations and programs within DOE use varying terms to document specific assessment results. In this report, EA uses the terms “deficiencies, findings, and opportunities for improvement (OFIs)” as

defined in DOE Order 227.1A. In accordance with DOE Order 227.1A, DOE line management and/or contractor organizations must develop and implement corrective action plans for the deficiencies identified as findings. Other important deficiencies not meeting the criteria for a finding are also highlighted in the report and summarized in Appendix C. These deficiencies should be addressed consistent with site-specific issues management procedures.

Criteria used to define the scope of this assessment were derived from the maintenance program implementation objectives and criteria of CRAD 45-11, which includes inspection criteria, activities, and lines of inquiry structured to support the assessment.

EA divided the assessment process into several stages, including offsite and onsite planning, underground access (hazards) training, onsite data gathering activities, report writing, validation, and review. Planning included discussions with responsible site and CBFO personnel, scheduling of the assessment, collection of applicable site procedures and documents, and document reviews. Onsite data collection focused on observation of work and the related processes for requesting and scheduling work, approving work performance, pre-job reviews, and performance feedback and review. After the onsite data collection period, EA prepared a draft independent assessment report identifying overall perspectives, deficiencies, and OFIs and made it available to line management for review and feedback.

EA initially identified and reviewed the applicable procedures that implement the conduct of maintenance program as defined in DOE/WIPP-06-3335, Revision 3, *Waste Isolation Pilot Plan Nuclear Maintenance Management Plan* (NMMP). A sample of management procedures, corrective and preventive maintenance work packages, LO/TO documents, USQD review documents, and maintenance performance reports were also reviewed against the requirements of DOE Order 433.1B and the WIPP NMMP. Interviews were performed with NWP management, field work supervisors (FWSs), and craft personnel.

During this assessment, EA discussed identified deficiencies and significant observations with CBFO and NWP periodically and during the closeout briefings. Any suggested program or process improvements for management consideration are listed in the OFIs in Section 7.0. The members of the EA assessment team, the Quality Review Board, and EA management responsible for this assessment are listed in Appendix A. Appendix B provides a detailed list of the documents reviewed and personnel interviewed relevant to the conclusions of this report.

5.0 RESULTS

5.1 WIPP Conduct of Maintenance Program

Criteria

Maintenance processes for the system are in place for corrective, preventive, and predictive maintenance and to manage the maintenance backlog, and the processes are consistent with the system's safety classification. (DOE Order 433.1B)

NWP revised and now implements the procedures developed in response to the *WIPP Recovery Plan for Conduct of Maintenance*. As a result, the WIPP maintenance program has improved. Revision 4 of the NMMP was recently approved by CBFO and issued by NWP on April 7, 2016. The EA 2014 finding that NWP had not conducted the required scope of NMMP implementation assessments every three years has been resolved, and NWP performed comprehensive work planning and control assessments in December 2014 and 2015. Maintenance program implementing procedures appropriately address DOE Order

433.1B requirements and recent revisions demonstrate continuing program improvement. Although maintenance schedule adherence is frequently impacted by emergent work or conditions, maintenance work “completed as scheduled” generally exceeds the NWP goal of 80%, and the reasons for “schedule non-delivery” are tracked to identify any trends that must be addressed. NWP initiated Phase I of a *Maintenance & Work Control Program Improvement Project Implementation Plan* to address work control performance and effectiveness issues. The project involves the appropriate representatives of the NWP operations, maintenance, engineering, and nuclear safety organizations. Further, it is based in part on the best practices of the commercial nuclear utility industry, as documented in Electric Power Research Institute (EPRI) Report 1003479, *Equipment Reliability Case Studies, INPO* [Institute of Nuclear Power Operations] *AP-913 Equipment Reliability Process Implementation Summaries*. The project is intended to facilitate a gradual transition to a rolling 8- or 12-week maintenance activity schedule process. This process is intended to provide sufficient time to adequately plan, resource, walk down, stage equipment and materials, perform work as scheduled, and incorporate performance feedback, while appropriately accommodating emergent higher priority corrective maintenance (CM). Efforts are also under way to establish or revise preventive maintenance procedures (PM), complete required USQ reviews, and approve the new and revised procedures to ensure compliance with the latest revision of the documented safety analysis (DSA) and technical safety requirements (TSRs), which were approved on April 29, 2016.

WIPP predictive maintenance activities are currently limited to vibration analysis of ventilation fans, and do not routinely take advantage of other predictive techniques to enhance SSC reliability and availability such as periodic thermography and oil analysis. Although the just approved Revision 4 of the WIPP NMMP commits to evaluate future applications of thermography and vibration analysis, improvement in WIPP equipment reliability can be achieved by establishing a better balance between corrective, preventive, and predictive maintenance activities as recommended in DOE Guide 433.1-1A Change 1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1B*. (See **NWP-OFI-01**.)

EA observed the initial team review of a proposed Interim Ventilation System Startup Test work control document (WCD) developed by maintenance planning. The team appropriately concluded the WCD had to be converted to a technical procedure in accordance with WIPP Procedure (WP) 15-PS.2, *Procedure Writer's Guide*, which the team acknowledged as a lesson learned from a previous EA assessment relative to compliance with NWP administrative procedures. The team agreed that the planner would turn the WCD over to the NWP Procedures organization for revision.

WP 02-AR3001, *Unreviewed Safety Question Determination (USQD)*, establishes NWP’s process for determining whether proposed facility changes are adequately evaluated relative to the approved safety basis and for ensuring that any proposed changes determined to involve a USQ are brought to CBFO’s attention for review and approval before taking any action that involves a positive USQ. WP 10-WC3011, *Work Control Process*, requires new or revised WCDs to be reviewed and processed as required by the USQD procedure. The current CBFO-approved USQD procedure establishes appropriate guidance and qualification requirements for the NWP staff to determine whether a WCD involves work where the USQD process is not applicable, or should be reviewed as a USQ screen or determination. NWP does not currently authorize maintenance planners to perform USQ applicability reviews, screens, or determinations, but instead requires the Nuclear Safety (NS) organization to review all new and revised WCDs to determine, prior to release for performance, that the planned work does not involve a USQ. A sample of PM and CM WCDs indicated that NS has appropriately reviewed the recently submitted WCDs using their USQ review process. However, two Type 3 PM activities that EA reviewed (out of a total of ten) had been released for implementation and had not been submitted to NS for the USQD process review. The involved planner said he had done most of his work with Type 1 WCDs, which include a required cover sheet data field for recording “USQ Screening or Evaluation” information; Type 2 and 3

WCD cover sheets do not have a pre-printed data field for recording the results of the USQ process review.

The USQD procedure requires documentation of the conclusion of the USQ review process but does not require any documentation of the technical basis for concluding the USQ process is not applicable to a particular WCD. Not requiring a documented basis for determining that the USQ process is not applicable hinders efficient independent review.

Concurrent with a major work planning project to revise WIPP PMs, NS identified lists of PMs in 2013 that they planned for further USQ process reviews and those where further review was not then planned. Based on interviews, NS indicated that the lists were not official documents but were based on informed NS judgment and did not reflect the results of a USQ process review, as was assumed by some members of the maintenance work control staff. Further, the PMs listed under the heading of “No USQ” were not deemed “categorically excluded” from the need for USQ process review, as was allowed by the then-current revision of the USQD procedure. As a result, many PMs have not yet received a USQ process review as required by WP 10-WC3011. These are two examples where WCDs are not receiving USQ reviews as required. **(Deficiency)**

Conduct of Maintenance Program Conclusion: The NWP WIPP maintenance program is generally compliant with DOE Order 433.1B and continues to improve. However, additional effort is warranted to improve the balance between corrective, preventive, and predictive maintenance activities as recommended in DOE Guide 433.1-1A Change 1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1B*, and to complete the remaining PM procedure USQD reviews as required by WP 10-WC3011.

5.2 WIPP Conduct of Maintenance Program Implementation

Criteria

Maintenance activities associated with the system, including work control, post-maintenance testing, material procurement and handling, and control and calibration of test equipment, are formally controlled to ensure that changes are not inadvertently introduced, that the system fulfills its requirements, and that system performance is not compromised. (DOE Order 433.1B)

EA reviewed WCDs and observed pre-job briefings and use of personal protective equipment (PPE). Work performance was generally very good, with effective coordination and communication between work groups and excellent demonstrated knowledge of the work being performed. For example, the observed performance of Work Order (WO) 1615367 and associated PM 041042, *Underground Exhaust Fan 41-B-860B*, demonstrated excellent coordination and communications between operations, maintenance mechanics and electricians, and the health physics staff. The work was well performed and appropriately included the pre-job briefing, operations and maintenance LO/TO of the fan and associated pneumatic damper, zero energy verification, surveys to confirm that no radiation work permit was necessary, performance of the work, removal of maintenance locks and tags, and the post-job review.

Workers effectively performed all observed LO/TO activities during this two-week assessment with appropriate arc-flash PPE and establishment of personnel safety barriers. NWP operation and maintenance staff followed the current LO/TO procedure, as required. However, the actual sequence of LO/TO activities required by the procedure involving both the operations and maintenance staffs introduced inefficiencies without measurably enhancing safety. Specifically, the current LO/TO procedure requires the operators to LO/TO components they control and to verify the appropriate component positions, locks, and tags. The LO/TO procedure then requires independent verification by

the maintenance staff of component positions, locks, and tags before returning to the Facility Shift Manager's office and signing the operations-authored LO/TO sheet. Only then does the procedure allow maintenance staff to return to the LO/TO location to hang their own locks and tags and re-verify the correct maintenance LO/TO has been completed. There is little or no safety benefit to requiring maintenance to delay hanging their own locks and tags until after returning to operations and signing in on the operations LO/TO log certifying completion of their independent verification. NWP is currently developing a procedure revision with input from operations and craft personnel to improve LO/TO efficiency without creating safety concerns.

EA did not observe any significant safety concerns. However, EA noted several examples of inattention to detail and inability to implement WCDs as released for performance without appropriate changes (**Deficiency**):

- Model Work Order (MWO) 00014, *Emergency Egress Light Maintenance* provides instructions for performing electrical maintenance work on plug-connected emergency egress lights, including replacement of the entire fixture where needed. The MWO indicates that there are two types of light fixtures and that the manufacturer operating and maintenance (O&M) instructions (varies by manufacturer) are "REQUIRED ON-HAND." The electricians assigned to the work were generally familiar with the function of the fixtures and were successful in evaluating fixture operability and replacing fixtures requiring repair. However, when questioned, the electricians did not have the manufacturer's O&M instructions on hand for either light fixture type. Instead, they retrieved a brief information sheet on one of the two types of light fixtures from a box containing a replacement light fixture, and subsequently could find the O&M instruction for only one of the light fixtures.
- WO 1514456 and associated PM 045116, *Roll Up Door Inspection and Maintenance*, provides instructions for performing the semi-annual inspection and maintenance of the overhead doors in building 411. Workers appropriately performed the observed mechanical maintenance work with good use of PPE and scissor lift platform safety. However, the door motor breaker was tagged and locked in the "OFF" position, contrary to the accompanying LO/TO Control Sheet, which specified the door motor breaker locked and tagged position to be "OPEN." The work was not stopped when the LO/TO deficiency was pointed out.
- WO 1615508 and associated PM 053031, *A/C Unit Maintenance*, provides instructions for performing the weekly cleaning of the condenser cooling fins, evaporator coil fins, and air intake filter inspection replacement. Underground electrical maintenance staff performed the pre-job briefing and actual work in the mine. However, the PM prerequisites required obtaining a "FARR: #20/20 Pleated Air Filter" to support filter replacement. (EA was unable to determine the meaning of the "FARR" acronym other than as an appropriate replacement filter procurement specification.) Despite this specification, work planning provided a "FARR: #30/30 Pleated Air Filter," and the electricians did not realize the discrepancy until EA pointed it out. Subsequent Internet research by EA and the NWP FWS showed that the "FARR: #30/30" filter may be more appropriate for use in the mine because it can handle a higher salt dust loading. NWP has not yet determined how the change in filter media came about.
- Five of seven reviewed Salt Handling Hoist PMs (PM 038007, 012, 017, 023 and 043) could not be implemented as written until the prerequisite requirements were revised to reference the correct PM sections that listed the materials and equipment to be obtained. Once EA identified the problem, the responsible FWS made appropriate minor changes, and the workers performed the actual work effectively.
- WP 12-IS.03, *Electrical Safety Program Manual*, establishes NWP's electrical hazard PPE requirements. However, contrary to arc-flash PPE requirements, a worker donned and intended to use arc-flash PPE with a large hole in the PPE sleeve. Once EA identified the problem, the FWS counseled the worker, and another worker provided the proper PPE to support the required electrical LO/TO.

- WO 1616603 provides instructions to stage an adjustable center of gravity lifting fixture (ACGLF) to support adjusting and recording the torque of specified bolts to resolve a non-conformance report (NCR). However, the responsible FWS appropriately questioned the adequacy of the WO and led the work crew in a walkdown of the job. They determined that the ACGLF CM WCD was insufficient to ensure access to the bolts to be torqued. Further, they found that some of the bolts could not be accessed with a torque wrench without disassembly of the ACGLF or special tooling, neither of which was addressed in the WCD.

Although EA identified deficiencies in certain aspects of the WIPP conduct of maintenance program execution, workers exhibited a good questioning attitude, generally paused work when issues were identified in work documents and procedures, and raised issues to their supervisor for resolution.

Conduct of Maintenance Implementation Conclusion: Observed maintenance staff generally performed very well, demonstrating excellent knowledge of the work to be performed and good coordination between work groups. However, attention to detail was occasionally lacking in maintenance procedure planning, review and approval, and adherence.

6.0 FINDINGS

EA identified no findings during this assessment. Deficiencies that did not meet the criteria for a finding are listed in Appendix C of this report, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified one OFI to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies identified in appraisal reports, they may also address other conditions observed during the appraisal process. EA offers this OFI only as a recommendation for line management consideration; it does not require formal resolution by management through a corrective action process and is not intended to be prescriptive or mandatory. Rather, it is a suggestion that may assist site management in implementing a best practice or provide a potential solution to an issue identified during the assessment.

- **NWP-OFI-01:** Consider incorporating in the NWP *Maintenance & Work Control Program Improvement Project Implementation Plan* a stated objective to establish an appropriate balance between corrective, preventive, and predictive maintenance activities, in order to ensure that it addresses the guidance of DOE Guide 433.1A Change 1.

Appendix A Supplemental Information

Dates of Assessment

Onsite Assessment: March 14-17 and April 11-14, 2016

Office of Enterprise Assessments (EA) Management

Glenn S. Podonsky, Director, Office of Enterprise Assessments
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Quality Review Board

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Michael A. Kilpatrick

EA Site Lead for WIPP

Jeff Snook

EA Assessors

Tim Martin – Lead

Appendix B
Key Documents Reviewed, Interviews, and Observations

Documents Reviewed

Agenda, Work Request Prioritization Meeting, 4/13/2016
DOE/WIPP-06-3335, WIPP Nuclear Maintenance Management Plan, Rev-3
DOE-WIPP-06-3335, WIPP Nuclear Maintenance Management Plan, Rev-4
DSA-TSR, Rev 5, 12/14/2015 NOT APPROVED YET
EPRI, Equipment Reliability Case Studies, INPO AP-913 Equipment Reliability Process Implementation Summaries
Maintenance & Work Control Program Improvement Project Implementation Plan
Master Document List, PM Procedure Status, 11/18/2015
Memo NS to Maintenance dated 6/18/2013 with Attached PM USQ Recommendation List
MSA-MAI NT-2016-001, Maintenance and Work Planning & Control Self-Assessment, 12/14/2015
MWO 00014, Rev-3, Emergency Egress Light Maintenance
NCR 2014-24 – Degraded Facility #482 support beams on the East side of facility.
NCR 2015-03 - MOD & HI HEPA filters for 41-B-856 & 41-8-857 do not meet requirements.
NCR 2015-04 -ACGLF Short Leg for 41-T-034 leg has wear that brings its integrity into question.
NCR 2015-08 - 41-N-100 -Airlock door 100, damage to drive mechanism
New NWP Performance Indicators, March 2016, CM Work Request Age
NWP Performance Indicators Report, January FY 2016
PM 000059, Rev-0 TRN 1 IA, Evaporative Cooler Spring Startup
PM 038007, Rev-4 IA, Salt handling hoist rope Weekly Inspection
PM 038009, Rev-6 TRN 1B, Salt Handling Hoist LILLY Controller Weekly Inspection
PM 038012, Rev-4 TRN 1 IB, Salt Handling Hoist Brakes, Weekly Inspection and Maintenance
PM 038017, Rev-5 TRN 2 IA, Salt Handling Hoist Headframe and Headsheave Weekly Inspection
PM 038023, Rev-5 TRN 1 IC, Salt Handling Hoist Drum Assembly Weekly Inspection
PM 038037, Rev-4 IB, Salt Handling Hoist Auxiliary Compressor Monthly Inspection
PM 038043, Rev-5 IA, Salt Handling Hoist Power Converter Quarterly Cleaning and Inspection and Maintenance
PM 041042, Rev-11 IA, Underground Exhaust Fan
PMs Past Required Date Report As of 4/13/2016
Schedule Non Delivery Reasons Report, 2/29/2016
SMP-14-011, Maintenance and Work Planning & Control Independent Assessment, 12/18/2014
T -0 Daily Scheduled Work/Daily Release, 3/22/2016
T+1 Schedule Adherence Report, 3/28/2016
T-1 Weekly Lock In Report, 3/14-20/2016
T-1 Weekly Lock In Report, 4/11-16/2016
WCC/Maintenance SMP & CAP Info, 2/3/2016
WF14-313, Details Report, Inadequate Heat Trace Surveillance Results without Resolution Comments
WF14-316, Details Report, FSM Authorization and COM Release Before WCD Approved
WF15-005, Closure of EA December 2014 Finding F-WIPP-1
WIPP DOE response to DNFSB Maintenance SIR 2012
WIPP POD/POW Schedule, 3/10-16/2016
WIPP Staff Issue Report Maintenance from Defense Nuclear Facilities Safety Board 2012
Type 3 WO 1507607, CM for Loose Power Distribution Panel Front
Type 3 WO 1514456, PM 045116, Rev-5, Roll Up Door Inspection and Maintenance
Type 3 WO 1615509, PM, Underground 4 Ton A/C Unit
Type 1 WO 1309312, CM, Replace Rusted Switchrack #6 Components and Wiring

Type 1 WO 1616261, Install 120Vac, 20A Branch Circuit at Central Monitoring Room Desk
Type 2 WO 1615509, PM, 4 Ton A/C Unit
Type 3 WO 1616603, CM, AGLF Corrective Maintenance to Resolve NCR on Loose Bolting
Type 3 WO 1617434, CM, Clean and Remove Carbon Buildup from Compressor Discharge Pipe
Type 2 WO 1615367, PM, Underground Exhaust Fan 41-B-860A, B & C
Type 2 WO 1615603, PM, Waste Hoist Brake System Accumulator
Type 2 WO 1615602, PM, Waste Hoist Brake Pads
Type 2 WO 1512754, PM, Grapple Hoist Inspection
WP 02-AR3001, Rev-10, Unreviewed Safety Question Determination
WP 02-AR3001, Rev-11, Unreviewed Safety Question Determination
WP 02-AR3001, Rev-12, Unreviewed Safety Question Determination
WP 04-AD3011, Rev-15-FR1, Equipment Lockout/Tagout
WP 04-AD3012, Rev-7, Temporary Plant Modification Control
WP 04-AD3013, Rev-39, Underground Access Control
WP 04-AD3030, Rev-6, Pre-Job and Post-Job Reviews
WP 04-AD3032, Rev-4, Senior Management Review Board
WP 04-GC1000, Rev-1, Seasonal Facility Preservation
WP 10-WC 04, Rev-1, Skill of the Craft, Skill of the Worker Program
WP 10-WC3010, Rev-27, Periodic Maintenance Administration and Controlled Document Processing
WP 10-WC3011, Rev-36, Work Control Process
WP 10-WC3012, Rev-1, Work Control Document Writers Guide
WP 10-WC3013, Rev-1, WCD User's Guide
WP 10-WC3014, Rev-0, Periodic Maintenance Activity Screening Process
WP 10-WC3015, Rev-1, Scheduling and Work Authorization
WP 10-WC3017, Rev-1, Post-Maintenance Testing
WP 10-WC3018, Rev-0, Skill of the Craft - Skill of the Worker
WP 12-IS.03, Rev. 13, Electrical Safety Program Manual
WP 15-CA1004, Rev-0, Performance Monitoring and Reporting
WP 15-GM1002, Rev-4, Issues Management Processing of WIPP Forms
WP 15-PS.2, Rev.-12, Procedure Writer's Guide

Interviews

Deputy Maintenance Manager
Electrical Maintenance Field Work Supervisors (3)
Maintenance Manager
Mechanical Maintenance Field Work Supervisors (3)
Nuclear Safety Manager
Operations Deputy Manager
Preventive Maintenance Improvement Project Manager
Preventive Maintenance Planning Supervisor
Surface Maintenance Manager
Waist Hoist Cognizant Engineer
Work Control Manager
Work Planning Manager

Observations

Failed Emergency Egress Lighting Fixtures Corrective Maintenance
Mine Safety Annual Refresher/Underground Hazard Training
Interim Ventilation System Startup Test Team Review

Multiple Lockout/Tagout Installations
Multiple Pre-Job Briefings
NWP Plan of the Day/Plan of the Week Meetings
NWP T+1 Review Meeting
NWP T-0 Daily Work Release Meetings
NWP T-0 Work Progress Meetings
NWP T-1 Weekly Lock In Meeting
NWP Action Request Screening/Work Request Prioritization Meeting
Roll Up Door Mechanisms Preventive Maintenance and Inspections
Salt Waste Hoist Preventive Maintenance (6)
Underground 3 Ton Air Conditioning Unit Preventive Maintenance
Underground Exhaust Fan and Associated Dampers Preventive Maintenance and Inspection

Appendix C Deficiencies

Deficiencies that did not meet the criteria for a finding are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

- WCDs are not being reviewed by authorized individuals per WP 10-WC3011, Work Control Process to verify that the planned work does not involve a USQ.
- Many observed maintenance activities had to be paused to make required, but frequently minor, procedure changes to facilitate workers' compliance with the maintenance procedure as written and as required by WP 13-1, Rev-36, *NWP Quality Assurance Program Description*, and WP 10-WC3013, Rev.-1, *Work Control Document (WCD) User's Guide*.