

WP 10-2
Revision 32

Maintenance Operations Instruction Manual

Cognizant Section: Maintenance Operations

Approved by: Leroy Bostick



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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGE
31	06/30/10	Added references. Added new training requirement for ME. Added new management/designee attendees for POD. Added HIC instructions and duties throughout document and changes to AJHA. Added new instructions for WCC and CHAMPS. Added Operations Liaison and duties in document. Work Window Coordinator changed duties. Added Records Coordinator and duties. Added two new duties for Craft. Added disclaimer for Repository Development MEs to Standard Man-hour estimates and deleted Means estimating standard.
32	08/31/10	Added information for Change History Summary SIMON documents. Updated definition for Continuous Use procedures. Added information for Hazard Summary (HS). Added information for the Outage Manager. Added Note 1 to Attachment 2 on leather gloves.

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ACRONYMS AND ABBREVIATIONS

AR	Action Request
CAMP	Capital Asset Management Process
CAS	Condition Assessment Survey
CE	Cognizant Engineer
CFR	Code of Federal Regulations
CH	Contact-Handled
CHAMPS	Computerized History and Maintenance Planning System
COM	Cognizant Operations Manager
DOE	U.S. Department of Energy
EDMS	Electronic Document Management System
FSM	Facility Shift Manager
FWC	Field Work Complete (Status 85)
HEPA	High-Efficiency Particulate Air (filter)
HIC	Hazard Identification Checklist
HS	Hazard Summary
JHA	Job Hazard Analysis
ME	Maintenance Engineer
MEL	Master Equipment List
MSDS	Material Safety Data Sheet
M&TE	Measuring and Test Equipment
MWI	Maintenance Work Instructions
NEPA	National Environmental Policy Act
PM	Preventive Maintenance
PMS	Preventive Maintenance Schedule
PMP	Preventive Maintenance Procedures
POD	Plan of the Day
POW	Plan of the Week
PPE	Personal Protective Equipment
PRS	Project Records Services
QA	Quality Assurance
RE	Responsible Engineer
RH	Remote-Handled
SDD	System Design Description

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SSR	Stores Stock Request
TSR	Technical Safety Requirements
RTW	Ready to Work (Status 60)
USQ	Unreviewed Safety Question
WCC	Work Control Center
WCN	Work Change Notice
WIPP	Waste Isolation Pilot Plant
WTS	Washington TRU Solutions LLC
WWC	Work Window Coordinator
ZMM	Zone Maintenance Manager
ZS	Zone Superintendent

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1.0 WORK INSTRUCTIONS ^{1, 2, 3}

1.1 Introduction

This section provides supplemental instructions for preparation of work instructions at the Waste Isolation Pilot Plant (WIPP), and applies to work performed by Washington TRU Solutions LLC (WTS), Operations, Construction, or subcontractor personnel.

1.2 References

BASELINE DOCUMENTS

- DOE O 433.1B, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*
- DOE/WIPP-07-3372, *Waste Isolation Pilot Plant Documented Safety Analysis*
- DOE/WIPP-07-3373, *Waste Isolation Pilot Plant Technical Safety Requirements*
- WP 02-AR3001, Unreviewed Safety Question Determination
- WP 04-AR3030, Pre-job and Post-job Reviews
- WP 04-CO.01, Conduct of Operations
- WP 09-CN3022, Engineering File Room Operations
- WP 12-IS3002, Job Hazard Analysis Performance and Development

1.3 Writing Maintenance Work Instructions

The Maintenance Engineer (ME) or Cognizant Engineer (CE) will ensure the following when writing work instructions:

- Appropriate Timeouts for Safety Hold Points are used.
- A graded approach should be used in determining the type and depth of detail required.
- When information is not applicable to a specific section, enter "NONE" under the section heading.

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- Tagouts shall be prepared only from controlled copies of prints or drawings, or from physical verification at the equipment or component site. Control drawings, schematics, and vendor manuals will be controlled according to WP 09-CN3022.

1.4 Work Instruction Sections

Work instructions provide guidance for performance of maintenance activities. The following comments are intended to describe work instruction sections.

Cover Pages:

- Work instruction title
- Work order number
- Table of Contents (optional)

Introduction:

Will include the following:

Description of the work to be performed.
Definition of the work boundaries for the work package.
What is expected to be accomplished?

For example:

"This procedure performs a calibration verification test and alignment of the High-Efficiency Particulate Air (HEPA) Unit 41-B-877C 1st HEPA filter differential pressure monitoring loop 41 FO51027." This work is limited to loop FO51027 components.

References:

Baseline Document (Developmental)

For Example:

Title 30 *Code of Federal Regulations* (CFR) Part 57, "Safety and Health Standards-Underground Metal and Nonmetal Mines"

WP 04-AD3011, Equipment Lockout/Tagout

Referenced Documents (Required on-hand)

Gould DR3000 Draft Range Pressure Transmitter O&M Manual (Bulletin 103)

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Equipment List:

List of special tools, test, or safety equipment needed to perform the work and minimize delays.

Measuring and Test Equipment:

- Listed measuring device and minimum accuracy.

Precautions:

Use a Job Hazard Analysis (JHA) to alert procedure users to actions and conditions that represent potential hazards, pose possible damage to equipment, or establish abnormal conditions.

Limitations:

Limitations define boundaries that are not to be exceeded, and system or equipment capacities or conditions.

Include any potential Technical Safety Requirements (TSRs) conditions that may apply during the work evolution.

Hold and Witness Point:

Provide a list of Hold and Witness Points.

Lockout/Tagout:

Provide a recommended Lockout/Tagout for work area.

Prerequisites:

Actions required prior to work instruction performance.

Performance:

This section provides guidance actions performed to ensure that the following items are included:

- Work (Optional)
- Field Work (Optional)
- Area Inspection and Cleanup and Storage

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- Task Verification/Post-Maintenance Testing/Retest

A test section is required in all work orders.

Before returning equipment to service following maintenance/task, the equipment should be tested to demonstrate that it is capable of performing its intended function.

Three purposes are served by this:

1. The testing should verify that the maintenance/task was performed successfully (e.g., the original problem was corrected);
2. No additional problems were introduced;
3. The system affected by the maintenance was performed properly.

IF the work performed does not require a test,
THEN the test section of the instruction should state "None."

If the work performed requires a retest:

- It may reference operating procedures that operate the equipment.
- It must include a sign-off and date by the person successfully completing the retest.
- Acceptance criteria will be stated in the work order.
- Retest results must be documented in the overview section.
- System Restoration Turnover
- Administrative

Change History Summary

Table to identify changes made to document during revision process. The table will be an attachment residing in SIMON and will have to be manually populated by the writer. The location of the table will be at the end of the document and it will not be considered record material for historical purposes. This requirement is for PMs and MWIs only.

1.5 Definitions

Continuous Use - Any technical procedure that is to be kept open and followed step-by-step without deviation during the performance of the work activity. Procedures must be

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designated as "Continuous Use" by the responsible manager when any of the following occur:

- The document contains Radiological Control sign-offs as a result of a survey or swipe taken;
- An error during the performance of the activity would result in an unnecessary risk;
- The activity is complex and/or performed infrequently, as determined by the responsible manager;
- The document contains one or more of the following sign-offs: Hold, Witness, or Independent Verification required by an organization other than the document custodian.

Specific sections within a procedure can be designated as "Continuous Use" by the responsible manager. This designation must be noted within the body of the procedure.

The Continuous Use procedure will be designated on the Title Page of the procedure as "Continuous Use."

General Intent – The experienced judgment of the craft personnel and his/her supervisor is exercised to carry out the maintenance.

The general intent procedure will be designated on the Title Page with no document type. The area normally used to indicate "Continuous Use," will be left blank.

1.6 Temporary Testing Lineups and Electrical Lead Lifting

All electrical leads lifted and re-terminated as part of a maintenance activity shall be specified in the body of the work instructions, or documented in the work performed similar to sections located in the site's temporary plant modification control procedure. All leads lifted during the performance of the work instructions must be re-terminated during the performance of the work instructions.

If maintenance requires temporary jumpers and test gauges, perform the following:

- Using a lifted lead sheet or table, ensure removal and installation as specified in the body of the work instructions.
- Remove all temporary jumpers and test gauges used during the performance of the work instructions after the performance of the work instructions.

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1.7 Bypassing and Overriding Plant Interlocks

Plant interlocks are installed to protect equipment and personnel or to prevent the release of hazardous material into the environment.

If work instructions require overriding equipment or safety interlocks, they should be performed only under adequate control and only under approval of the cognizant organization.

1.8 Troubleshooting or Inspection of Equipment

ME/CE, when writing troubleshooting work instructions, will ensure the following:

- Troubleshooting actions are directed by RE (Responsible Engineer)/Zone Maintenance Manager (ZMM) to the craft prior to work performance.
- Provide a space for a detailed explanation of the troubleshooting and inspection actions performed. Resolutions resulting from such actions are documented in the work order.
- Operation of the equipment to determine the cause of failure or problem symptoms shall be performed by qualified operators using approved operating procedures.

1.9 Troubleshooting of Equipment/System Problems

All troubleshooting actions shall either be directly supervised or taken with the direct knowledge of a RE or ZMM. Decision between direct supervision and being kept informed should be made by the supervising person based on the nature of the equipment, the potential impact on mode compliance, and the potential hazard to either personnel or equipment.

It is recognized that detailed work instructions are usually impractical for troubleshooting; therefore, the ME shall consider the following items in the development of troubleshooting work instructions:

- The supervising person shall ensure that troubleshooting results are properly documented in the work package. The work instructions should accommodate this need for documenting actions taken.
- Minor repairs may be accomplished during the performance of troubleshooting, and are limited to items similar to those listed below. If situations develop where these limitations may not apply, the Maintenance Manager may clarify and authorize the repairs in question.

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- Blown fuses may be replaced once with an "in kind" replacement. If the fuse blows again, an Action Request (AR) should be generated to repair the cause.
- Faulty terminations may be repaired.
- Fasteners and terminations may be re-torqued to appropriate values.
- Indicating lamps, bulbs, and lights may be replaced.
- Faulty circuit boards may be replaced "in kind."
- Standard safety precautions must be taken for working on or near energized equipment.
- Jumpers and lifted leads used during troubleshooting shall be installed, removed, verified, and documented in the same manner used during corrective maintenance work instructions (MWIs).
- The troubleshooting work instructions shall include a summary of the intended extent of the troubleshooting; and the prejob brief should cover this material to ensure that craft personnel are aware of any limitations and how the supervising person intends the work to progress. Work cannot be performed outside the prescribed scope unless a Work Change Notice (WCN) is completed.
- Test equipment used for troubleshooting/problem isolation does not need to be calibrated. Subsequent data collection to validate equipment operation must meet standard calibration requirements.
- Current, approved, and controlled drawings, schematics, etc., shall be used by personnel performing troubleshooting on various circuits. In the event no diagrams are available, a sketch of the affected wiring shall be made and included in the work package.
- Proper lockout/tagout procedures shall be followed during troubleshooting.
- The Cognizant Operations Manager (COM) shall be kept informed of any changes to the operational status of the equipment/component affected by the troubleshooting effort.

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2.0 POSITION RESPONSIBILITIES ^{1, 2, 3}

2.1 Introduction

The purpose of this section is to describe the positions and responsibilities of personnel assigned to perform functions described within this document. Position descriptions are defined within this document for maintenance personnel; however, it is understood that personnel outside the Maintenance Organization need to utilize this process. For the purpose of this process, any manager shall have the authority and responsibility as designated for Zone Maintenance Manager. Any engineer shall have the authority and responsibility as designated for Maintenance Engineer. Any Superintendent or Manager designee shall have the authority and responsibility as designated for Zone Superintendent. Any operators/technicians shall have the authority and responsibility as designated for Maintenance Technician.

2.2 References

BASELINE DOCUMENTS

- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*
- WP 04-CO, Conduct of Operations
- WP 10-WC3011, Maintenance Process

2.3 Maintenance Manager

- Manage the site maintenance program.
- Ensure the use of predictive maintenance.
- Ensure the use of a preventive maintenance (PM) program.
- Maintain a priority system for conducting maintenance.
- Maintain a priority and tracking system for developing maintenance procedures.
- Establish a system program that ensures that safety-related work packages are given a high priority.

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- Provide technical writing services for preventive maintenance procedures (PMPs).
- Ensure that PMs are removed from inactive status.
- Ensure long-range planning includes staffing, government, and industry issues. Contractor and corporate long-range support will also be factored into the plan.
- Ensure maintenance technician training as required to assure craft expertise to complete maintenance tasks.
- Ensure ME training as required to assure the proficiency of the MEs. Training may require, but is not limited to the following: ME-01 Authorization Card, Person in Charge (PIC-06) and equipment qualification/training.
- Provide maintenance technician support for PM activities.
- Ensure that PMPs and work instructions contain job safety warnings and instructions to facilitate safe work conditions.
- Ensure the proper performance of work instructions and work packages.
- Ensure the use of an annual maintenance outage schedule for all zones.
- Ensure that the maintenance procedures, maintenance administration procedures, and work instructions are followed by maintenance personnel.
- Regularly review the reports from Computerized History and Maintenance Planning System (CHAMPS) to identify trends associated with the overall maintenance program and institute corrective actions, as needed.
- Ensure that the work orders have time estimates entered, using the approved method of estimating.
- Ensure that ZMMs spend sufficient time with the zone craft while performing work orders to identify concerns and problems with the program. (As a guideline, this is 60 percent of the ZMM's time.)
- Ensure that all required training is complete.
- Ensure the proper use of the Modification Impact Sheet and maintain a tracking system to track commitments. Commitments will be tracked utilizing the Commitment Tracking System (CTS).

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- Review the Modification Impact Tracking System (CTS) periodically to verify that commitments are being completed on schedule.
- Ensure that overdue PMs are reviewed each week and any subsequent recommendations are given to Operations regarding the impact.
- Perform an annual evaluation of the PMP.
- Ensure a Plan of the Day (POD) meeting is held during the primary work shift.
 - The purpose of the POD will be to review emerging issues and support the Facility Shift Manager (FSM) in assigning appropriate priorities to maintenance or related activities. The POD will also review and update the Integrated Schedule with special emphasis on safety related systems.
 - The POD will normally consist of management/designees from the following departments:
 - Work Control Center (WCC). (WCC will Chair the POD)
 - Facility Operations
 - Waste Handling, RH & CH
 - Engineering
 - Repository Development Project
 - Safety
 - Maintenance
 - Transportation
 - Quality Assurance
 - Experimental Projects
- In the event of action being required on off-hours or emergent work during the day, the FSM will have authority and responsibility to act on behalf of the POD membership. This action will require appropriate completion of EA10-2-1-0, Action Request.
- Activities in the Underground may be directed per Telephone Communication with the appropriate individuals. The FSM must be kept informed of any emergent activity and has the authority to direct activities.
- Ensure a Plan of the Week (POW) meeting is held each week with the POD membership. The meeting will function as a planning session for future projects and maintenance activities.
- Ensure appropriate maintenance personnel are trained in various methods of problem analysis.

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- Periodically conduct status meeting with maintenance personnel.
- When making changes which affect broad areas of the department, solicit input from affected personnel.
- Ensure operation personnel involved with job planning are reinforced at least annually on pre-job briefs, management presence, adequate detail for work scope, and hazard identification.

2.4 Zone Maintenance Managers

- Supervise the craft and MEs, in their respective zones.
- Spend sufficient time in the field observing the craft perform maintenance activities (as a guideline, 60 percent of a manager's time [at a minimum] should be spent performing this task).
- Review Maintenance Operations action requests for accuracy, completeness, and safety implications.
- Ensure that all maintenance activities and work areas are in compliance with site safety and environmental policies and procedures.
- Supervise a professional and operational training program for zone personnel.
- Provide final approval authority for all new PMPs entering the PM program, in accordance with the PM/MWI controlled document processing procedure.
- Ensure zone personnel are familiar with the maintenance operations procedures governing how maintenance is performed.
- Ensure work instructions have been reviewed for activities that affect TSR requirements.
- Ensure USQ determination is completed prior to releasing package.
- Ensure the work order instructions are followed by craft personnel.
- Ensure that the Maintenance Operations administrative procedures are understood by personnel governed by them.
- Ensure that the configuration management policies are understood by personnel governed by them.

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- Implement standards contained in the WTS "Code of Business Ethics and Conduct and Defense Industry Initiatives." Ensure that subordinate employees are informed about the standards and related policies, and enforce them within the supervised activities.
- Conduct weekly toolbox safety meetings.
- Conduct prejob and post-job meetings in accordance with WP 04-AD3030, Pre-job and Post-job Reviews, and discuss any safety-related items in work orders.
- Release the scheduled work each day, in accordance with the Integrated Schedule.
- Schedule assigned zone personnel training and work assignments.
- Provide input for performance reviews, planning, scheduling, and budgeting.
- Ensure by their signature that the work package has been reviewed for safety hazards, including TSR requirements, and all necessary mitigating actions are, to the best of their knowledge, addressed in the package. Ensure that the JHA Checklist has been completed and integrated in the work order for all corrective work orders, as required.
- Prior to work being assigned to specific craft personnel, ensure that the assigned personnel are qualified to perform a specific evolution or work on the assigned equipment.
- Remain cognizant of work order backlogs.

2.5 Zone Superintendents

- Maintain technical direction in their zone.
- When the ZMM is unavailable, release the scheduled work each day, in accordance with the Integrated Schedule.
- Remain cognizant of assigned work orders, approval requests, and PMPs.
- Review ready-to-work work orders for completeness and accuracy to ensure that the retest section of the instructions retests the equipment for the maintenance actions performed.
- Ensure that the POD/POW Integrated schedule is current.

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- Ensure that maintenance activities are coordinated with QA, Operations, Safety, and Engineering, as needed.
- Ensure emerged activities are processed following WCC protocol.
- Ensure that the correct approvals have been entered on the work order before scheduling and sending the package to the Maintenance Manager for release.
- Ensure work instructions have been reviewed for activities that affect DSA/TSR requirements.
- Ensure that a USQ determination has been completed prior to releasing package.
- Ensure that a Hazard Identification Checklist (HIC) or HS has been completed and included in the work package for "C" packages and Modification work orders that do not utilize an MWI, and any safety concerns in the package are addressed. For packages that utilize an MWI for a portion of the task and written instructions for the remainder, the HIC will be utilized for the entire work order. The Hazard Summary (HS) may be used in place of the HIC at the user's discretion.
- Review CHAMPS performance data on a regular basis to verify trends in the program, such as increasing backlogs and work performance verifiability is 25 percent from the estimates.
- Ensure that MEs are estimating man-hours and that estimated hours have been entered in CHAMPS. Not applicable to Repository Development MEs.
- Ensure that material staging areas are managed in accordance with the materials staging section.
- Ensure the equipment numbers in packages are correct.
- Assign the craft technicians and MEs their daily assignments.
- Verify craft personnel are qualified to perform assigned work activities.
- Monitor the craft personnel during the performance of their work, being perceptive to any safety implications associated with the work environment.
- Conduct the weekly maintenance engineers meeting, as required.

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- Keep the craft training schedule updated and forward all anticipated absences to the Zone Scheduler.
- Verify that all work orders have both ME/CE and craft time estimates attached before submitting them to the Work Group Manager for review.
- Verify that all WCNs are properly approved and incorporated into the associated work packages.
- Assist the craft in the technical discharge of their duties.
- Provide information to scheduler to update the annual maintenance schedule as required.
- Integrate outage requirements with the WCC.
- Ensure work order is ready to work prior to scheduling in the Integrated Schedule.
- Provide daily work order status/issued through POD attendance/call-in or appropriate update to Work Window Coordinator prior to each meeting.
- Status CHAMPS to 80 when work is released for the day.
- Status CHAMPS to 85 when work is Field Work Complete.
- Forward completed work order to ME for closeout.

2.6 Maintenance Engineers

- Provide Incident energy values for electrical work order packages, as derived from drawing 25-J-020-W1.
- Complete a pre-job walkdown and HIC or HS with appropriate craft for "C" work packages that do not utilize an MWI. For packages that utilize an MWI for a portion of the task and written instructions for the remainder, the HIC or HS will be utilized for the entire work order. Hazards identified on the HIC or HS will be incorporated and mitigated in the work order. Signatures of responsible ME along with included craft will signify completion of the HIC or HS. Include completed HIC or HS in "C" work orders for Historical Record.
- Write work instructions in accordance with approved documents.

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- Ensure work instructions include any requirements to maintain compliance with TSR conditions.
- Provide required reference materials for work orders and PMPs.
- Initiate/incorporate WCNs in accordance with approved documents.
- Coordinate crafts' input when writing work instructions.
- Direct/oversee activities when craft is troubleshooting equipment/system problems.
- Obtain and stage parts and materials as required for work orders and PMPs.
- Include instructions to maintenance personnel, as required, to examine failed parts and document the results of the examination in the work order using the graded approach.
- Participate in construction tests and support turnover activities for construction contracts.
- Perform field walk-downs to identify equipment/system problems, as necessary.
- Review equipment history for past equipment problems to aid in corrective actions and development of work instructions.
- Complete review and closeout for work packages in accordance with approved documents.
- Complete CHAMPS closeout including change status to 90, Historical Data, accurate time entries.
- Forward work order to Scheduler.
- Complete trending analysis for each completed corrective maintenance work order on equipment designated as mode compliance equipment, or as requested.
- Review WIPP procedures and regulatory documents, as assigned.
- Participate in the identification and resolution of deficiencies or nonconformances.
- Maintain configuration control.

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- Provide support to the Outage Manager for the preparation and execution of any planned outages.
- Obtain and manage subcontracts required for equipment/systems assigned to their zone.
- Obtain and stage parts and materials as required for work orders and PMPs. Credit card purchases will be made in accordance with WP 15-PC3042.
- Initiate procurement requisitions, as required.
- Evaluate predictive maintenance report and recommended corrective action plan.
- Research lockout requirements, including interface drawings, for work orders.
- Submit complete utility outage forms to the WCC.
- Maintain document control for maintenance procedure in EDMS (Electronic Document Management System).
- Review PMPs and MWIs biennially and revise/update, as necessary.
- Assist ZS in establishing, reviewing, and updating time standards to be used in work orders, PMPs, and MWIs.
- Ensure Status 20 for In Planning Work Orders in CHAMPS.
- Ensure work order Status 60 when Ready to Work.
- Forward work order to Scheduler when Ready to Work and update CHAMPS.

2.7 Schedulers

- Maintain a file of ready-to-work packages.
- Provide the Work Control Center with data for the Zone Performance Indicators.
- Track PMPs and PMP validations.
- Schedule PMPs on a priority basis.

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- Coordinate manpower availability.
- Schedule ready-to-work jobs on a priority basis.
- Provide daily input for the Integrated Schedule.
- Provide weekly input for the Integrated Schedule.
- Update the Annual Maintenance Schedule (i.e., new equipment, rescheduled Preventive Maintenance Schedule [PMS]).
- Update the Annual Outage Schedule, as required.
- Use the CHAMPS computer system to track man-hours, work order current status, closeouts, new issues, tracking, reports, etc.
- Route work orders and PMP data sheets to ZS and engineering groups.
- Maintain plant equipment history files.
- Provide administrative functions for scheduling and closeout of maintenance work orders.
- Update CHAMPS Maintenance Task in the PM module for new or obsolete equipment.

2.8 Operations Liaison

- Maintain technical direction of WCC.
- Produce and manage the Integrated Schedule at direction of the POD team.
- Provide data for work week assessment indicators.
- Ensure department administrative procedures current.
- Evaluate A/Rs for duplication.
- Ensure A/R completeness and accuracy.
- Present A/Rs at POD/POW.
- Provide direction to WCC WWCs and Schedulers.

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- Schedule Priority 4A, 5A, 5B, and 5C work into planned maintenance periods and outages.
- Assist in planning, scheduling, and coordination of outages.

2.9 Work Window Coordinator

- Conduct POD and POW.
- Coordinate all work activities within area of responsibility.
- Provide scheduling requirements to Zone Maintenance.
- Ensure work orders are Ready to Work (RTW) prior to adding to Integrated Schedule, including parts, materials, craft, etc.
- Coordinate activities with all necessary departments to ensure availability of equipment or system requiring maintenance.
- Provide daily update to Schedulers for inclusion in Integrated Schedule.
- Perform duties of Operations Liaison when required by absence, illness, etc.
- Communicate with Zone Superintendents and Zone Managers to facilitate the most time effective manner to perform maintenance on site equipment. (When one group has a piece of equipment down, schedule work from other groups to take advantage of the equipment being down.)
- Ensure work order scheduling and closure for weeks of schedule responsibility.
- Assist Superintendents with coordination of outage permit activities.
- Obtain required scheduling data from Schedulers.
- Develop and present Work Week Assessment.

2.10 Records Coordinator

- Maintain plant equipment history files.
- Perform work order closure completeness review.
- Coordinate performance indicators for department goals.

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- Provide data to Cognizant Engineers to facilitate annual walkdowns.

2.11 Maintenance Technicians (Craft)

- Diagnose and perform corrective repairs on malfunctioning facility equipment and systems utilizing lockout/tagout, as required.
- Maintain and apply local building and craft codes within areas of specialization.
- Perform PM on plant systems and equipment.
- Recommend to management appropriate methods for correcting unsafe practices or applications.
- Provide guidance to lower classified craft personnel to improve their skills.
- Perform special and emergency assignments, recognizing urgency and need to complete assignments.
- Perform maintenance and related assignments not within areas of specialization, as directed or assigned.
- Provide assigned maintenance services on site systems and equipment.
- Achieve and maintain required formal training qualifications.
- Provide property management for maintenance property.
- Control consumable and flammable goods during maintenance activities.
- Follow work instructions in accordance with definitions of "Continuous Use," "Reference Only," and "Information Only," and stop work when instructions cannot be performed.
- Assist with work instructions.
- Perform pre-job walkdown as required for Hazard Identification.
- Provide maintenance performed data as required for Maintenance History.

2.12 CHAMPS Administrator

- Develop maintenance backlog accounting systems and maintenance status reports.

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- Administer the CHAMPS.
- Provide CHAMPS training.
- Provide support to Zone Schedulers and Work Control, as required.

2.13 Person in Charge

- Ensure adequate work barriers are established at the work site to provide a safe work environment for the workers.
- Stop work if additional job hazards or changing conditions develop beyond the scope of the original JHA.
- Ensure that all maintenance activities and work areas are in compliance with site safety and environmental policies and procedures.
- Ensure maintenance activities are in compliance with TSR requirements.
- Ensure that the work order instructions are followed by craft personnel.
- Ensure that maintenance activities are coordinated with QA, Operations, and Safety, as needed.
- Ensure that the work instructions contain sufficient detail to identify the safe work boundaries and prevent the potential of performing activities outside these boundaries.
- Ensure that personnel involved in the performance of the work have attended the pre-job briefing. This includes any additional resources added to the job as it progresses.
- Ensure that if the craft/technicians performing the work are different from the individuals who originally walked down the work site, additional walk-downs are performed as needed prior to commencement of the job.

3.0 HAZARD IDENTIFICATION CHECKLIST^{1, 2}

3.1 Introduction

The purpose of this instruction is to provide direction for the preparation of the HIC or HS. The HIC and HS, available on the Automated Job Hazard Analysis (AJHA) software, are performed to ensure that the craft/operator/ZS/ZMM/UMM is presented with information regarding potential work hazards at the work site.

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The HIC or HS will be completed by the responsible Engineer and craft for "C" work orders not utilizing an MWI and Modification work orders. For packages that utilize an MWI for a portion of the task and written instructions for the remainder, the HIC or HS will be utilized for the entire work order.

For Skill of the Craft maintenance, the HIC or HS and AJHA software will be utilized to develop the JHA that is contained in the Skill of the Craft notebook.

This instruction shall be used by the responsible Engineer in the preparation of applicable work instructions.

3.2 References

- Hazard Identification Checklist (AJHA Software)
- Hazard Summary (AJHA Software)

3.3 Instruction

Perform the following in the area where the work is to be performed:

- 3.3.1 ME or Cognizant Engineer for Modification work orders, inspect the job site with the craft for the presence of job hazards.
- 3.3.2 For "C" work orders not utilizing an MWI or Modification work orders, document the job site inspection by using the HIC or HS in the AJHA software. Hazards identified on the HIC or HS will be incorporated and mitigated in the work order. Signatures of responsible Maintenance Engineer or Cognizant Engineer along with included craft will signify completion of the HIC or HS. Include completed HIC or HS in the "C" work orders not utilizing an MWI and Modification work orders, for Historical Record. For electrical hazards, refer to Attachment 2, General Guidelines to Electrical Safety Requirements, for possible mitigating actions.
- 3.3.3 All identified hazards will be listed in the precaution section of the work instruction with reference to mitigating step or steps in the work order, when work instructions are included with the work order package.
- 3.3.4 If the Engineer is unable to identify mitigating actions, request Industrial Safety's assistance in development of mitigating actions.

4.0 TIME ESTIMATES^{1,2}

4.1 Introduction

The purpose of this instruction is to provide guidance for establishing time standards to be used in writing instructions for work orders, MWIs, and PMPs.

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4.2 References

- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*
- *MEANS Facilities Maintenance & Repair Cost Data*

4.3 Standard Man-Hour Estimates

Estimated man-hours shall be extended appropriately when conditions are outside those specified. The man-hours used for estimating work are those which may be expected to be expended under the following conditions: (This section is not applicable to Repository Development MEs.)

- The work is being performed by personnel familiar with the conditions at the site and qualified for the task.
- The work has proper supervision and adequate craft support, if needed.
- Temperatures are not below 40° F or above 85° F at the work location.
- The normal workweek does not exceed 40 hours.
- The work being performed is as described in the work package.
- Necessary drawings/data sheets are available in the work package, and the drawings and data are current and correct.
- Standard man-hours for craft work in each work package shall include time for items that are incidental to performing the work task. Those items typically include:
 - Travel to and from the work location
 - Lockout/tagout requirements
 - Completion of required documentation
 - Completion of required permits
 - Acquisition of necessary materials or tools/instruments

The estimated man-hours for new work orders shall be made using experience from similar tasks.

When man-hour time estimates exceed a complete hour by more than 15 minutes, the estimate shall be rounded up to the next higher hour.

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If a work package estimate is less than one hour, an effort shall be made to combine it with another package to provide at least one hour's work for the craft.

4.4 Revising Estimated Man-Hours

The actual man-hours reported on scheduled preventive maintenance work orders shall be compared to the estimated man-hours during the closeout process.

If the estimated man-hours deviate by ± 30 percent from the actual time required, the estimated hours in the CHAMPS PM module shall be changed to reflect the more accurate numbers.

If the actual man-hours reported exceed the estimated man-hours by more than 30 percent due to technical difficulties, the reason must be apparent in the comments section of the work order.

4.5 Lockout/Tagout Standards

Lockout/tagout times are minimums and will vary with the distance between and complexity of tagouts.

Equipment that has previously been tagged out by Operations will require fifteen minutes prior to and following the job for the craft to hang and remove their maintenance locks (30 minutes total).

Unscheduled or on-demand work requires about 25 minutes for combined maintenance lockout/tagout activities prior to start of work. Recovery requires about 15 minutes.

Scheduled jobs that have lockout/tagouts in multiple locations on both the surface and underground, require about 30 minutes prior to and following the job for maintenance locks and tags.

Unscheduled or on-demand work in multiple locations requires 60 minutes prior to, and 30 minutes following, the job for lockout/tagout.

Impairment tags such as safety or fire protection can be placed in parallel with lockouts or tagouts and therefore, do not need to be considered for time estimating.

4.6 Permits

Confined space permits require about 10 minutes prior to the start of a job and no craft time at the end of the job.

Equipment set up for confined space entries requires about 30 minutes of craft time prior to, and 30 minutes following, the job.

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Radiation work permits require about 30 minutes of craft time prior to and following a job.

4.7 Material/Tool Acquisition

Picking up and returning tools or instruments at the tool crib uses about 10 minutes prior to and following the job.

Picking up pre-staged parts from the lay down area requires about 5 minutes prior to the start of a job.

Picking up material from the warehouse requires about 15 minutes prior to the start of a job.

4.8 Travel Times

The following are average allowances for travel times:

- Surface - On-site, 10 minutes (round trip 20 minutes)
- Surface - Off-site, 20 minutes (round trip 40 minutes)
- Underground, 10 minutes (round trip 20 minutes)
- Surface to or from the underground, 45 minutes (round trip 90 minutes)

5.0 MATERIAL STAGING

5.1 Introduction

The purpose of this instruction is to provide a process for the prejob staging of parts and material for the Maintenance Operations zone's work orders and PMPs.

This instruction will apply to all maintenance zones. Material staging for the construction zone work packages will be the responsibility of the subcontractor.

5.2 References

- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*

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5.3 Site Receipt of Parts, Material, and Consumables

- All parts, materials and consumables will be received by the warehouse in accordance with the appropriate warehouse, purchasing, and QA procedures.

5.4 Material Staging

The managers of Surface Maintenance Operations shall designate an area that can be locked, or otherwise controlled, as a staging and lay down area. The controlled area will be separate from normal work areas.

Staging areas shall be used only for scheduled projects. The staging area is not intended to be used as a satellite warehouse. Certain spare parts will be in the underground staging areas due to environmental considerations.

The staging area shall be environmentally suitable for the staging of all anticipated material.

Measures shall be taken, as necessary, to separate and safely stage incompatible materials.

A notice shall be posted in the staging area that indicates where the material safety data sheets (MSDSs) for any staged chemicals are located.

The ZMMs shall designate those personnel that are authorized access to their respective staging areas.

The ZMMs shall be responsible for ensuring their staging areas are kept neat, clean, and orderly.

No radioactive materials or material that is radioactively contaminated shall be staged in the staging area.

Material shall be labeled, stored and segregated by work order number. Material in the underground may be stored by equipment number.

5.5 Removal of Material from the Staging Area

Staged material shall be removed from the staging area only with the approval of the ZMMs.

Unused material will be returned to the staging area with the approval of the ZMMs. The unused material will be disposed of by the ME within one month.

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6.0 UTILITY OUTAGES

6.1 Introduction

The purpose of this instruction is to provide direction for the preparation, coordination, and control of planned utility outages at WIPP. Planned outages will be conducted for the purpose of performing corrective, predictive and PM, testing, construction, and modifications.

This instruction will ensure that construction, maintenance modifications and testing performed during a planned outage has been properly scheduled.

Excluded from this instruction are the following:

- Emergency repairs or service
- Outages that affect redundant equipment and systems such that utility service is maintained throughout the outage

6.2 References

- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*
- EA10-2-11-0, Utility and Building System Outage Permit

6.3 Definitions

Planned Outage - A planned construction, modification, testing, and maintenance effort requiring the securing of utilities to portions of the WIPP site with potential impact on waste receipt readiness and other site activities.

Utilities - Service supplied to surface and underground facilities, such as:

- Compressed air
- Normal, alternate, or backup electrical power
- Processed and sanitary sewer removal systems
- Potable water systems
- Underground ventilation

Utility and Building System Outage Permit - The controlled document, EA10-2-11-0, shall be used when an outage of normal utility or building system service is required for construction, modification, testing, repair, or maintenance purposes.

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Outage Manager - The person accountable for the performance of the tasks identified for the outage. The Outage Manager will be responsible for the overall conduct of the preparation and execution phases of the outage.

6.4 Outage Responsibilities

Normally, all WIPP site utility outages will be prepared and coordinated by the Outage Manager. However, Facility Operations may prepare outage notifications and coordinate outages for operational purposes such as equipment operational tests, training, plant demonstration, plant realignment, etc.

Outages are authorized by the COM or designee in their areas of cognizance.

General notification of all site utility outages, regardless of extent or duration, will be made to all site personnel over the site's public address system. Posted notification will be made at the discretion of the FSM.

The Integrated Schedule will be the vehicle used for notification to affected groups of a planned outage.

The Outage Manager shall ensure that planned outages are scheduled on the POW/POD at least five working days prior to the intended outage date, when applicable. This time constraint will be at the discretion of the Outage Manager for outages that are needed to repair essential equipment.

Each ZMM will perform the duties of Outage Manager when a utility outage, for the purpose of maintenance, is conducted in their zone of responsibility. The outage manager will be responsible for the overall conduct of the preparation and execution phases of the outage.

At any time during the review process, if a problem is identified with any of the packages, the responsible engineer will generate the associated documentation to correct the problem.

6.5 Annual Outage Schedule

Each Zone Maintenance Manager will maintain (if required) an annual schedule showing planned utility outages for their zones of responsibility.

The Maintenance Manager will issue an Annual Outage Schedule to affected operations managers.

Once issued, the schedule may be changed only as a last recourse and with the approval of the Maintenance Manager.

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6.5.1 Planned Outage Preparation

The following planning schedule is provided for the use of the Outage Manager, ZS, Operation Liaison, and WWC in the preparation for site impactful outages. Verbatim compliance with this schedule is not mandatory; but, at a minimum, the schedule shall be used as a guideline. The schedule shall also be used, as much as practical, for preparation of smaller, less-impactful outages that arise on shorter notice.

Time Frame	Outage Planning
15 to 20 days prior	Ensure EA10-2-11-0, is completed and forwarded to the Operations Liaison. Responsibility: ME
10 to 15 days prior	All work packages associated with the outage are compiled and given to the ZS for review and approval. Responsibility: WCC ZS/ZMM submits to the tool crib a list of the necessary M&TE and the tools required for the outage. Responsibility: ZS/Outage Manager
10 days prior	All outage packages are given to the assigned ME for review for completeness, WCN, staging of parts, and print identification. Return to ZS. Responsibility: ME
8 days prior	All outage packages are given to the assigned craftsman for review with comments and returned to the ZS Responsibility: Maintenance Craft
5 days prior	The first meeting with all personnel associated with the outage. Outage packages are given to the COM for review and comment. Responsibility: WCC
3 days prior	Assigned ME obtains all associated prints and verifies all parts are staged and ready for the outage. Responsibility: ZS/ME
1 day prior	Second meeting with all personnel associated with the outage. This will include the Facility Operations crew that will be on shift the day of the outage. Maintenance Technicians stage all associated M&TE, and verify parts, tools, and special equipment associated with the outage.
Outage day	Prior to starting the outage, the Outage Manager conducts a prejob safety meeting with all craft, engineers, and support personnel associated with the outage. Responsibility: Outage Manager
After the outage	At the discretion of the Outage Manager, a post-outage review is performed.

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6.5.2 Irregular Outages

Occasionally, it may be necessary to conduct a utility outage that will significantly impact the site to perform corrective maintenance that cannot be delayed until a regularly scheduled outage. In this event, the paragraph under Section 6.5.1 shall be used to the maximum extent practical for planning the outage. All applicable items of the outage preparation schedule shall be addressed prior to the outage.

6.5.3 Outage Permit Preparation

Outage Permits shall be prepared for utility outages in those cases for which redundancy of services does not exist. For example, if securing a portion of the domestic water system will not result in a loss of domestic water service to any occupied area of the site, because of system redundancy, an outage permit does not need to be performed.

EA10-2-11-0 shall be prepared for nonemergency outages by the ME.

Outage Permits shall be prepared and submitted to the WCC at least five working days in advance of the planned outage when applicable. This time constraint will be at the discretion of the Outage Manager for outages that are needed to repair essential equipment. Notification for unplanned outages should be submitted as soon as identified.

The WCC will publish the outage notification in the Integrated Schedule to provide advance notification to site personnel of the impending outage. This action shall take place a minimum of five working days in advance of the planned outage or as soon as possible for the unplanned outage.

Notification to the affected groups shall be by the POD.

Outage postponement shall require notification of all affected organizations and a site-wide public address announcement by Facility Operations (if necessary).

EA10-2-11-0 shall be processed as follows:

1. Fifteen to 20 days before, the ME will prepare EA10-2-11-0 per the Outage Schedule. A minimum of five working days notice on the POW is required for plant outages when applicable. This time constraint will be at the discretion of the Outage Manager for outages that are needed to repair essential equipment.
2. The ME routes EA10-2-11-0 for approval. The permit is added to POW.
3. The Operations Liaison verifies the scheduled outage at the POD meeting.

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6.5.4 Post-Outage Review Meeting

Review meetings do not need to be held for all outages. If events occurred that can provide a learning experience to prevent future problems or create more efficient outages, the Outage Manager, at his or her discretion, may consider conducting a post-outage review meeting.

The meeting should be held within five working days following completion of the utility outages to review the conduct of the outage and to develop lessons learned. The meeting will be the responsibility of the Outage Manager and will be held with the following attendees:

- COM
- Cognizant Engineer(s)
- Cognizant ZS(s)
- Cognizant ME(s)
- Cognizant ZMM
- Cognizant Maintenance Manager
- Operations Liaison

Additional personnel involved in the outage should attend at the discretion of the Outage Manager.

7.0 GROUND CONTINUITY

7.1 Introduction

This instruction will provide direction for the testing of stationary electrical equipment grounding systems. Continuously monitored systems are excluded from this program.

This instruction directs and assigns responsibilities for the testing of equipment grounding conductors, grounding electrode conductors, and grounding electrodes.

7.2 References

- Title 30 CFR Part 56, "Safety and Health Standards-Surface Metal and Nonmetal Mines" and §57.12028, "Testing Grounding Systems"
- Mine Safety and Health Administration Letter P94-IV-1 dated March 31, 1995
- WP 12-IS.01, Industrial Safety Program - Structure and Management
- WIPP Specification E-P-247, Grounding

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7.3 Equipment Grounding Conductors

Maintenance Operations, all zones, shall perform verification of grounding conductor continuity immediately after repair and any modifications performed by zone craft. The results of this testing will be recorded in the work order.

Maintenance Operations shall perform verification of grounding conductor continuity immediately following new equipment installation or subcontractor performed modification. The results of this testing will be recorded in the work order.

Condition Assessment Survey (CAS)/Capital Asset Management Process (CAMP) personnel shall conduct a visual inspection of fixed installations, such as rigid conduit, armored cable, raceways, cable trays, etc., that are not subject to vibration, flexing, or corrosive environments. Polarity/ground continuity tests of 120-volt wall receptacles shall be conducted to augment the visual inspection of systems generally concealed in walls. The results of this visual inspection will be recorded on the annual facility inspection.

Maintenance Operations, Zones 1 and 3, shall conduct an annual grounding resistance continuity check on equipment that meets the criteria of being subjected to vibration, flexing or corrosive environment. (See WIPP definition for "Corrosive Environments" in Section 7.6.) The resistance test will be made using an approved PMP with the results recorded on the procedure data sheets.

7.4 Grounding Electrode Conductors

Maintenance Operations, Zone 3, shall perform an annual inspection of the grounding grid using an approved PMP. The results of the inspection will be recorded on the procedure data sheets.

Maintenance Operations, Zones 1 and 3, shall perform verification of grounding grid continuity immediately following completion of any repairs or craft-performed modifications affecting the grid. The results of this testing will be recorded in the work order.

7.5 Grounding Electrodes

Maintenance Operations, Zone 3, shall perform an annual inspection of grounding electrodes using an approved PMP. The results of the annual inspection will be recorded on the procedure data sheets.

Maintenance Operations, Zone 3, shall perform verification of grounding electrode continuity immediately following repair or craft performed modifications. The results of this testing will be recorded in the work order.

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7.6 Criteria for Determining Equipment Eligibility

The following criteria shall be used to determine the electrical equipment that will be annually inspected for proper grounding continuity discussed in paragraph three of Section 7.3.

Vibration - Permanently installed electrical equipment with a grounding conductor that bridges across a vibration dampened or shock-mounted platform.

Flexing - Permanently installed electrical equipment whose main grounding frame is subject to twisting, flexing forces such that grounding continuity could be lost between the frame and grounding conductor or directly between the frame and the grounding grid.

Corrosive Environments - Environments with pH < or = to 2 or > or = to 12.5 whose characteristics involve deteriorating steel at a rate greater than 1/4 inch per year at a test temperature of 130°F. For the purposes of grounding, there have been no identified grounding conductors in these conditions.

Maintenance Operations, Zones 1 and 3, shall maintain a list on file of the permanently installed electrical equipment under their cognizance that meets these criteria.

8.0 TRENDING PROGRAM^{1,2}

8.1 Introduction

This instruction is used for trending the maintenance history of plant equipment. Trending is used to identify improvements in the maintenance program, as well as needed equipment modifications.

The MEs will review the maintenance history of equipment designated as mode compliance safety class, safety significant equipment on the Master Equipment List (MEL), along with any equipment requested by Cognizant Engineers. The MEs may, at their discretion, monitor the history of any plant equipment and take appropriate action, as described below.

This WIPP trending program serves as the Materials Condition and Aging Management Program described in the DOE-STD-1073-93. The process of trending equipment and analyzing operational data satisfies the need for periodic assessment of design life, design operating conditions, and performance characteristics. It applies to the functional classification of site equipment (as designated by the Master Equipment List), which has been determined to be those components whose failure would have a major cost, safety, or programmatic impact on waste handling operations. The organizational interfaces for assuring Materials Condition and Aging Management are defined in this instruction on the WIPP trending program.

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8.2 References

- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*
- DOE-STD-1073-93, Chapter 4, Implementation Guidance for Material Condition and Aging Management
- WP 13-QA3004, Nonconformance Report
- EA10-2-12-0, Trending Analysis Mode Compliance Equipment

8.3 Performance

The ME will complete the trending analysis sheet, EA10-2-12-0, for each completed corrective maintenance work order on equipment designated as mode compliance, safety class, safety significant equipment on the Master Equipment List (MEL). Other equipment can be requested to be trended by the appropriate Cognizant Engineers, ME, or Management.

- During work order closeout, review the CHAMPS equipment history.
- Consider the frequency of maintenance actions on the equipment to determine if, in his or her opinion, the failure rate of the equipment is abnormal.
- Check the appropriate box(es) on EA10-2-12-0.
- If answers to all are "NO," sign and date EA10-2-12-0 and file in the work package.
- If any answers are "YES," sign and date EA10-2-12-0 and forward to the CE.

The ME will:

- Obtain and attach a printout of CHAMPS equipment history.
- Obtain and attach any existing predictive maintenance data from the Predictive Maintenance Program Engineer (if applicable).
- Include any information or other details in the comments section that might assist the CE in performing the analysis.
- Forward information to CE.

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The CE will:

- Initiate NCR, as required.
- Disposition NCR, as required.
- Review trend analysis data and system walkdown data, and make an appropriate recommendation for corrective actions. Actions to be considered are:
 - A change to the PM requirements for the component/system.
 - A substitute of the failing or troubling component to a more robust component.
 - A modification to the system to eliminate a failure mechanism.
- Sign and return the completed EA10-2-12-0 form to the ME within five working days.
- ME, place completed EA10-2-12-0 form in work package.
- ME, generate AR or WCN, as required, to complete required action.

9.0 SEASONAL FACILITY PRESERVATION PROGRAM

9.1 Introduction

The objective of the WIPP Seasonal Facility Preservation Program is to prevent building or equipment damage due to cold weather. This program is necessary because of the possibility of severe cold temperatures and resultant freezing during the winter months. This program provides the WIPP site with a freeze protection plan that includes details of facility inspections, PM, and corrective maintenance on WIPP buildings and equipment to assure continued safe facility operations and prevent freeze damage to government property.

To accomplish this, the Seasonal Facility Preservation Program will:

Maintain PMPs that ensure that the freeze protection systems in place are verified to be operational prior to the cold months and are maintained throughout the year.

Provide for increased facility inspections by operators during the cold weather months to ensure that systems are functioning and suspected problems are immediately reported.

Give notification of severe cold or extreme heat conditions (seasonal) to the workers. Ensure that Personal Protective Equipment (PPE) for cold weather is made available and work and environmental conditions are monitored for severe cold or heat stress.

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9.2 References

- DOE O 433.1A, Maintenance Management Program for DOE Nuclear Facilities
- DOE G 433.1-1, Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1

9.3 Responsibility

Maintenance Manager will:

- Verify that cold weather gear will be available for maintenance, emergency, and operations personnel.
- Verify that heating systems in facilities are cleaned, serviced, and functionally tested.
- Verify that antifreeze in cooling systems is checked and replaced, if necessary.
- Verify systems requiring special protection due to hazards or costs associated with freeze damage will have temperature alarms and/or backup heat sources.
- Generate and perform PMPs to verify the proper operation of the freeze protection systems prior to the cold weather period.
- Perform corrective maintenance as needed to repair or replace hardware or equipment to resolve deficiencies identified in facility inspections or during PMs.
- Keep maintenance histories on freeze protection systems and related equipment.
- Provide Facility Operations with the identification of all freeze protection systems and equipment for the purpose of increased surveillance during severe conditions.
- Inspect, test, and stage portable auxiliary heaters and have identified sources to obtain more, if needed.
- Make employees aware of the need to identify and report any suspected problem with heating or other cold weather protection equipment.
- Verify that operations staff have the specific responsibility for monitoring temperatures in facilities on and off shifts, including weekends and holidays.
- Verify that plans exist for alerting personnel and providing increased surveillance in periods of extreme, unusual, or extended cold.

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- Identify the main water supply shutoff valves, test for proper operation, and verify that they are readily accessible.
- Verify that unheated storage areas will be inspected to ensure that there are no materials susceptible to freeze damage.

10.0 LOST WORK PACKAGE

10.1 Introduction

Work packages are permanent records of maintenance work accomplished on the site. Included in these packages, as required, are QA verification of replacement parts, retest requirements, WCNs, vendor qualification, Modification Impact Sheet, Turnover Check Sheet, and Trending Analysis Check Sheet for mode compliance equipment. Accountability of work packages shall be maintained. Every effort should be used to locate the missing work package before it is declared lost. The recovery action for a lost work package will be based on whether the work was accomplished or not.

10.2 References

- DOE O 433.1A, Maintenance Management Program for DOE Nuclear Facilities
- DOE G 433.1-1, Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1
- WP 09-CN3005, Graded Approach to Application of QA Controls

10.3 Performance

The CE/ME will conduct a system walk-down to determine if work has been accomplished.

- If the work has not been completed, the WCC reissues the work package and stamps "REISSUED" on the cover sheet.
- If the work has been completed, WCC reissues the work package and stamps "RECONSTRUCTED WORK PACKAGE" on the cover sheet.

The CE/ME will perform or document the following:

- Determine QA requirements by using WP 09-CN3005.
- Determine any required retest.
- Close any outstanding Engineering Change Orders.

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- Complete Trending Analysis on Mode Compliance Equipment required.
- Complete Modification Impact Sheet, if required.
- Complete Turnover Check Sheet, if required.
- Locate any vendor qualification or certification, as required.
- Locate any receipt inspections for material used on the job.
- Assemble the package for review.

The ZMM/CE/ME will:

- Review a package to determine if any additional action will be required to document the completion of the work order package.
- If additional action is required to close the work order, the ZMM/CE/ME will write a WCN to the work package or submit an AR to complete the required action.
- Schedule the work and close the work order per Maintenance Process Procedure.

11.0 MODIFICATION REVIEW

11.1 Introduction

AR for a plant modification needs to be reviewed in-depth. The modification review will be conducted by the Maintenance Management with Engineering support, as required.

11.2 References

- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*

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11.3 Performance

The modification review will be completed to ensure that there is no increased risk to:

- The facility
- The equipment
- The environment
- Personnel

The life cycle cost analysis will be considered.

When modification is approved, Maintenance Management will sign the AR for approval.

ARs not approved will be returned to the originator with explanation.

12.0 SKILL OF THE CRAFT MAINTENANCE

12.1 Introduction

Maintenance tasks having a low risk, and routine, in nature should be completed using the Skill of the Craft concept. The Skill of the Craft work order does not require written work instructions. This section provides requirements for development of the Skill of the Craft Maintenance Program.

12.2 References

- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*
- WP 10-WC3011, Maintenance Process

12.3 Performance

- ZMM will determine if maintenance task meets the Skill of the Craft criteria per WP 10-WC3011, Maintenance Process, Attachment 5.
- Ensure "S" Packages are not used for work on intentionally energized systems. This does not include the absence of voltage verification, testing, or troubleshooting.
- Skill of the Craft work orders will be processed per WP 10-WC3011.

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- ZMM will maintain a notebook containing:
 - Qualification requirements for Skill of the Craft task.
 - JHA developed utilizing the AJHA software.
 - The Skill of the Craft qualification and JHA will be reviewed annually by ZMM.

12.4 Maintenance Activities

Minor maintenance activities are typically maintenance performed either at the WIPP Site, Skeen Whitlock Building, or the Storage and Record Centers. Minor Maintenance activities consist of, but are not limited to: movement of office materials, installation or disassembly of modular furniture, equipment operation, painting, cleaning, etc.

The following conditions must be met for minor maintenance activities:

- A. Documented qualifications requirements for minor maintenance tasks.
- B. JHA for tasks assigned as minor maintenance.
- C. HIC or HS (in AJHA software) will be used as a guide in developing the JHA.
- D. Pre-job briefs will be held for minor maintenance activities.
- E. Minor maintenance qualifications and JHAs will be reviewed annually.

13.0 PREVENTIVE MAINTENANCE PROGRAM

13.1 Introduction

The PM program consists of all systematically planned and scheduled actions performed to prevent equipment failure and reliability. The PM program will define the activities and the frequencies that they are performed. The PM program will consist of both traditional PM and predictive maintenance. Traditional PM may require that the equipment be shutdown, cleaned, inspected, or calibrated. Predictive maintenance is a "proactive method" of predicting equipment failures and executing repair actions before failures occur. Predictive Maintenance utilizes these noninvasive testing methods (vibration monitoring, oil analysis, ultra sound and thermography analysis) to evaluate the equipment condition.

13.2 References

- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*

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- DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*
- WP 10-WC3010, Maintenance PM/MWI Controlled Document Processing
- WP 10-WC3011, Maintenance Process

13.3 Performance

ZMM will ensure:

- Baseline data is established as required and updated upon completion of corrective maintenance.
- Format for data and operating conditions are designated for each machine and measurement point.
- Designate equipment to be included in the predictive maintenance program.
- Investigations are conducted for predictive maintenance items to determine why failure(s) were not identified before failure(s) occurred.
- Laboratory samples are packaged and shipped in a timely matter.
- Laboratory results are evaluated and corrective actions initiated, as required.
- Equipment is not to be operated for the sole purpose of obtaining data, unless justified.
- Predictive Maintenance Engineer or designee prepares written periodic reports to facility management to describe any identified problems.
- PM work orders are processed per WP 10-WC3011.
- PMP is developed per WP 10-WC3010.

Engineer will:

- Determine the need for PM using Attachment 1, Preventive Maintenance Need Determination.
- Determine the initial periodicity of the PM based on the manufacturer's recommendation, industry standards, or site conditions.
- Evaluate the overall effectiveness of the PM in improving facility and/or equipment availability while reducing cost.

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- Continually seek new and improved predictive maintenance processes.
- Evaluate predictive data and recommend changes to traditional PM procedures and periodicity.
- Evaluate equipment found with abnormally high readings or increasing trends and recommend a corrective action.

Scheduler will:

- Schedule the PM before or on its due date, and avoid utilizing the grace period when possible.

Delinquent Preventive Maintenance Administration:

- Delinquent PM is defined as the failure to field work complete a PM task by due date plus any grace period assigned. Every effort should be used to complete PM before the due date assigned.
- A delinquent report will be provided to the Maintenance Manager weekly.

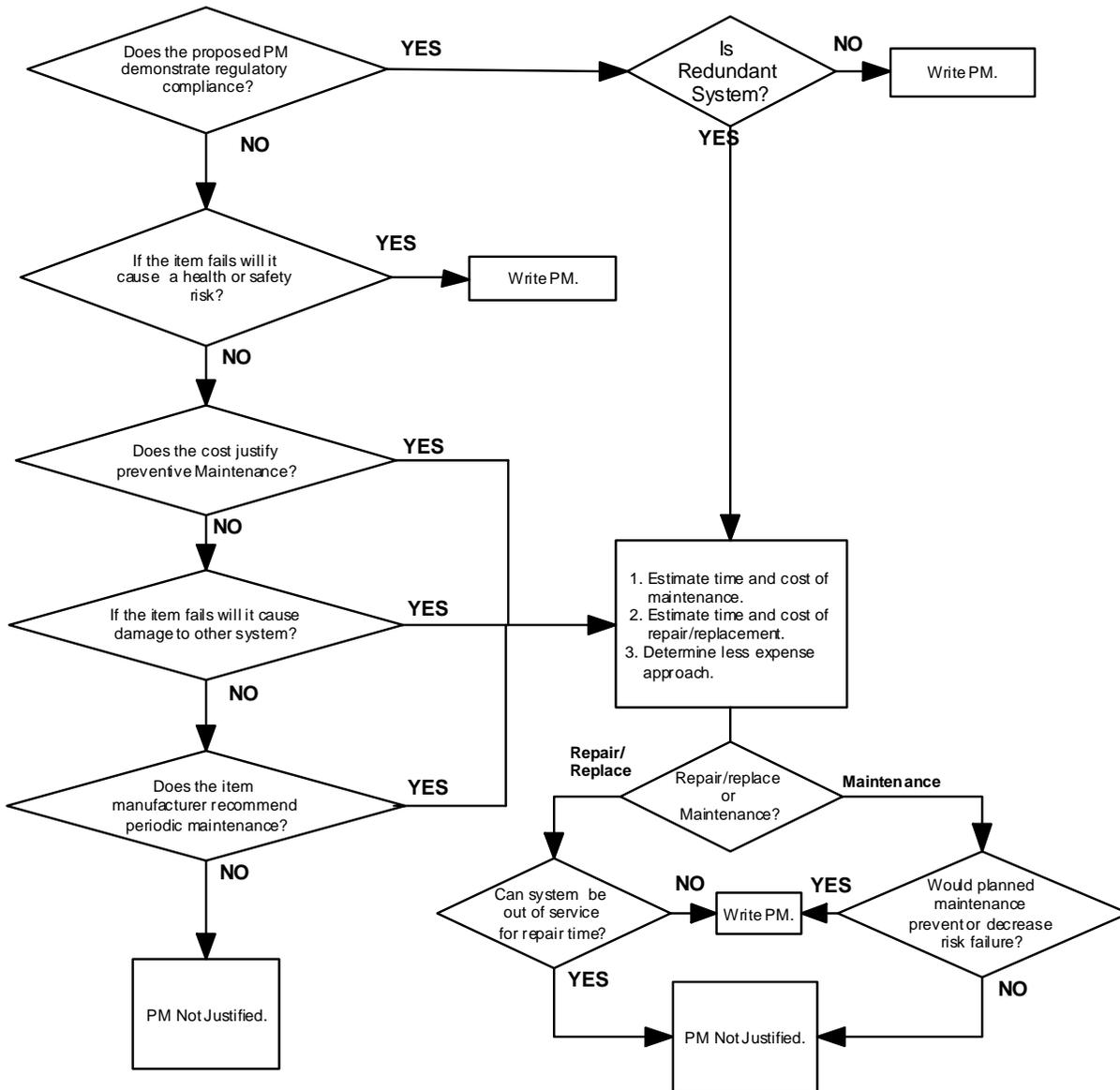
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- Grace period will be assigned based on the chart below:

Periodicity	Abbreviation	Grace Period in Days
Weekly (With Grace)	WKY	2
Monthly (No Grace)	MNN	1
Monthly (With Grace)	MNG	7
Quarterly (No Grace)	QTN	1
Quarterly (With Grace)	QTG	23
Semiannual (No Grace)	SAN	1
Semiannual (With Grace)	SAG	46
Annual (No Grace)	ANN	1
Annual (With Grace)	ANG	91
Biennial (With Grace)	BAG	182
Three Years	3YG	274
Four Years	4YG	365
Five Years	5YG	456
Counter		23

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Attachment 1 – Preventive Maintenance Need Determination



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Attachment 2 – General Guidelines to Electrical Safety Requirements

50 to 150V AC Line to Ground or DC Voltage Systems						
Work Description	Protective Clothing and Equipment					
<p>Where work is being performed within the flash protection boundary of exposed energized systems.</p> <ul style="list-style-type: none"> · Flash Protection Boundary 6 ft Minimum · Calculated Fault Current and its corresponding Incident Energy Exposure Level in Calories per Square Centimeter are shown on Drawing 25-J-020-W1, Table 20-1A. · Calories per Square Centimeter = cal/ sq cm · Arc Thermal Performance Exposure Value = ATPV 	· Safety glasses required on all operations.					
	100% Cotton Clothing (Long sleeve shirt and long pants)	Shirt or Switching Coat and 100% Cotton Pants or Coveralls (ATPV > 5.0)	Voltage Rated Gloves with Leathers (Note 1)	Voltage Rated Tools/ Instruments	Leather Footwear ANSI Z41 EH or SD	Hard Hat
Removing panel covers. < 1.2 cal/sq cm	X				X	
Removing panel covers. > 1.2 cal/sq cm		X			X	X
Energized Work/Verification of Absence of Power < 1.2 cal/sq cm	X		X	X	X	
Energized Work/Verification of Absence of Power > 1.2 cal/sq cm		X	X	X	X	X
CB or Fused Switch Operation. Doors/Covers "CLOSED"	X					
120/250 Volt DC System	X			X	X	

Note 1: EXCEPTION: Leather outers are not required when using Class 0 or Class 00 gloves for activities requiring manipulation of small equipment and parts if Management and the qualified worker both agree that the work to be performed poses no risk of damage to the rubber gloves and when the AC voltage does not exceed 250V.

Garments worn as under layers that neither ignite nor melt and drip in the course of an exposure to the electric arc and related thermal hazard may provide additional thermal protection. Materials which melt, such as hard hat liners and hair nets, shall not be permitted to be worn.

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Attachment 2 – General Guidelines to Electrical Safety Requirements

> 151 Volts AC to 600 Volts AC									
Work Description Where work is being performed within the flash protection boundary of exposed energized systems.	Protective Clothing and Equipment								
<ul style="list-style-type: none"> · Flash Protection Boundary 6 ft Minimum · Calculated Fault Current and its corresponding Incident Energy Exposure Level in Calories per Square Centimeter are shown on Drawing 25-J-020-W1, Table 20-1A. · Calories per Square Centimeter = cal/ sq cm · Arc Thermal Performance Exposure Value = ATPV 	<ul style="list-style-type: none"> · Safety glasses required on all operations. · Hard hat required on all operations except for closed cover switching. 								
		100% Cotton Clothing (long sleeve shirt and long pants)	Shirt or Switching Coat and Pants or Coveralls (ATPV ≥ 5)	Shirt or Switching Coat and Pants or Coveralls (ATPV ≥ 8)	Head/Face Shield (ATPV 8) Hearing protection (Note 1)	Leather Gloves	Volt- Rated Gloves with Leathers	Leather Footwear ANSI Z41 EH or SD	Volt-Rated Tools/ Instr
CB or Fused Switch Operation. Doors/Covers "CLOSED"	X								
Racking breaker to connect and disconnect position.			X	X	X		X		
CB or Fused Switch Operation. Doors/Covers "OPEN"			X	X	X		X		
Insertion or removal of low-voltage motor starter "buckets"			X	X		X	X		
Insertion or removal of power circuit breakers			X	X	X		X		
Removal of bolted covers from switchgear	<u>< 1.2 cal/sq cm</u>	X				X		X	
	<u>≥ 1.2 cal/sq cm ≤ 5 cal/sq cm</u>		X			X		X	
	<u>> 5 cal/sq cm < 8 cal/sq cm</u>			X	X	X		X	
<u>Verification of absence of power</u>	<u>< 1.2 cal/sq cm</u>	X					X	X	X
	<u>≥ 1.2 cal/sq cm ≤ 5 cal/sq cm</u>		X				X	X	X
	<u>> 5 cal/sq cm < 8 cal/sq cm</u>			X	X		X	X	X
<u>Work on Energized Parts (Note 2)</u>	<u>< 1.2 cal/sq cm</u>	X					X	X	X
	<u>≥ 1.2 cal/sq cm ≤ 5 cal/sq cm</u>		X				X	X	X
	<u>> 5 cal/sq cm < 8 cal/sq cm</u>			X	X		X	X	X
<u>Phasing</u>			X	X		X	X	X	
<u>Moving Insulated Energized Mining Cable >151 to 600 volts</u> <u>* (Refer to Industrial Safety Program WP 12-IS.01-7 for handling equipment)</u>						X		X	

Note 1: EXCEPTION: Leather outers are not required when using Class 0 or Class 00 gloves for activities requiring manipulation of small equipment and parts if Management and the qualified worker both agree that the work to be performed poses no risk of damage to the rubber gloves and when the AC voltage does not exceed 250V.

Note 2: When working on <151 volts circuits and energized parts >151/≤600 volts are present in the cabinet, the work can be worked as a <151 volt category when all other >151 /≤600 volt parts are covered by appropriate insulating sheeting.

Garments worn as under layers that neither ignite nor melt and drip in the course of an exposure to the electric arc and related thermal hazard may provide additional thermal protection Materials which melt, such as hard hat liners and hair nets, shall not be permitted to be worn.

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Attachment 2 – General Guidelines to Electrical Safety Requirements

>600 Volts AC to 15,000 Volts AC									
Work Description	Protective Clothing and Equipment								
<p>Where work is being performed within the flash protection boundary of exposed energized systems.</p> <ul style="list-style-type: none"> · Safety Flash Protection Boundary 6 ft Minimum · Calculated Fault Current and its corresponding Incident Energy Exposure Level in Calories per Square Centimeters are shown on Drawing 25-J-020-W1, Table 20-1A. · Calories per Square Centimeter = cal/ sq cm · Arc Thermal Performance Exposure Value = ATPV · Two-person rule 	<ul style="list-style-type: none"> · Safety glasses required on all operations. · Hard hat required on all operations except for closed cover switching. 								
	100% Cotton Clothing (Long sleeve shirt and long pants)	Shirt or Switching Coat and Pants or Coveralls (ATPV ≥ 5)	Shirt or Switching Coat and Pants or Coveralls (ATPV ≥ 8)	Head/ Face Shield (ATPV 8) Hearing protection	Grd Stick 3 ft. Min.	Leather Gloves	V- Rated Gloves with Leathers	Leather Footwear ANSI Z41 EH or SD	V-Rated Tools/ Instr.
CB, Fused Switch or LIS Switch Operation, Doors /Covers "CLOSED"	X								
CB, Fused Switch or LIS Switch Operation, Doors/Covers "OPEN." This includes racking breaker to connect and disconnect position.			X	X		X		X	
Removal of bolted covers from switchgear	$\geq 1.2 \text{ cal/sq cm} \leq 5 \text{ cal/sq cm}$	<u>X</u>		<u>X</u>		<u>X</u>		<u>X</u>	
	$> 5 \text{ cal/sq cm} < 8 \text{ cal/sq cm}$		<u>X</u>	<u>X</u>		<u>X</u>		<u>X</u>	
Verification of absence of power & Installation of Ground Clusters. Test cluster prior to use, acceptance using 10-amp DLRO is less than or equal to .01 Ohms, excluding test leads.	$\geq 1.2 \text{ cal/sq cm} \leq 5 \text{ cal/sq cm}$	<u>X</u>		<u>X</u>	<u>X</u>		<u>X</u>	<u>X</u>	<u>X</u>
	$> 5 \text{ cal/sq cm} < 8 \text{ cal/sq cm}$		<u>X</u>	<u>X</u>	<u>X</u>		<u>X</u>	<u>X</u>	<u>X</u>
Work on Energized Parts (Note 1)	$\geq 1.2 \text{ cal/sq cm} \leq 5 \text{ cal/sq cm}$	<u>X</u>		<u>X</u>			<u>X</u>	<u>X</u>	<u>X</u>
	$> 5 \text{ cal/sq cm} < 8 \text{ cal/sq cm}$		<u>X</u>	<u>X</u>			<u>X</u>	<u>X</u>	<u>X</u>
Insertion or removal of CBs from cubicles	X	<u>X</u>		<u>X</u>		<u>X</u>		<u>X</u>	
Troubleshooting Continuous Miner, < 1.2 cal/sq cm 74-U-605 (Note 1)		<u>X</u>					<u>X</u>	<u>X</u>	<u>X</u>
Phasing			<u>X</u>	<u>X</u>			<u>X</u>	<u>X</u>	<u>X</u>
Moving Insulated Energized Mining Cable > 600 to < 1000 volts * (Refer to Industrial Safety Program WP 12-IS.01-7 for handling equipment)						X		X	

Note 1: When working on <151 volts circuits and energized parts >151 /1000 volts are present in the cabinet, the work can be worked as a <151 volt category when all other >151/1000 volt parts are covered by class "O" insulating sheeting.

Garments worn as under layers that neither ignite nor melt and drip in the course of an exposure to the electric arc and related thermal hazard may provide additional thermal protection. Materials which melt, such as hard hat liners and hair nets, shall not be permitted to be worn.

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Attachment 2 – General Guidelines to Electrical Safety Requirements

Battery Work					
Work Description	Safety Equipment and Protective Clothing				
Lead Acid Batteries = X Gel Sealed Batteries = S	Tools Insulated Hand Tools/ Approved instrumentation	Face Shield	Apron	Nitrile Gloves	Eye Wash Station Within 25 Feet
Voltage Reading	XS				
Changing Batteries	XS	X	X	X	X
Torque Bolts	XS			X	X
Add Water	X	X	X	X	X
Testing Specific Gravity	X	X	X	X	X
Remove Battery Lead	XS	X		X	X
Cleaning/Brushing Terminals	XS	X	X	X	X