

Work scope details:

Title: Routine Maintenance of Steam Production Systems

Work Scope Summary: This work plan outlines the routine maintenance activities for the Steam Production Systems and related equipment at ORNL. The tasks include mechanical repairs, electrical troubleshooting, and preventive maintenance, ensuring the systems operate efficiently and safely.

Key Work Scope Components:

- Millwright tasks (pump maintenance, mechanical repairs)
- Pipefitting and welding tasks (piping repairs, valve replacements)
- Electrical tasks (voltage readings, minor wiring installations)
- Instrumentation and control tasks (diagnostics, calibration)
- Utility mechanic tasks (concrete repairs, floor leveling)
- Laborer tasks (material handling, site cleanup)
- Boilermaker tasks (pressure vessel maintenance)
- Carpenter tasks (scaffolding and containment structures)
- Insulator tasks (insulation removal and installation)

Relevant previous events and lessons learned:

Event Title	Event Summary	Lessons Learned	Reference Link
Equipment Failure in Steam System	A steam valve failed during operation, causing a pressure surge that resulted in equipment damage and downtime.	Regular inspections and preventive maintenance are critical to avoid equipment failures.	N/A
Electrical Shock Incident	An electrician received an electrical shock while troubleshooting a panel due to inadequate lockout/tagout procedures.	Strict adherence to lockout/tagout protocols is essential to prevent electrical hazards.	N/A
Asbestos Exposure During Maintenance	Workers were exposed to asbestos while removing insulation without proper precautions.	Proper identification and handling of hazardous materials are crucial for worker safety.	N/A
Confined Space Rescue Failure	A worker became incapacitated in a confined space due to lack of ventilation and proper rescue procedures.	Ensure proper ventilation and emergency response plans are in place for confined spaces.	N/A
Noise-Induced Hearing Loss	Several workers reported hearing loss after prolonged exposure to high noise levels during maintenance operations.	Implementing noise control measures and providing hearing protection is vital for worker health.	N/A

Missing Hazards:

Hazard	Missing or Inadequate Mitigation in Current Work Control Document	Recommended Mitigation for Revision	Reference Link	SBMS Link
Material Handling	Not addressed	Implement mechanical aids (e.g., hoists) for heavy lifting tasks.	N/A	N/A
Ladder Use	Not addressed	Require fall protection training and inspection of ladders before use.	N/A	N/A
Overhead Work	Inadequate mitigation	Use barricades and signage to restrict access below overhead work areas.	N/A	N/A
Electrical Hazards	Not addressed	Ensure all electrical work follows lockout/tagout procedures and requires a permit.	N/A	N/A
Confined Spaces	Inadequate mitigation	Conduct air quality monitoring and ensure rescue plans are established.	N/A	N/A
Temperature Extremes	Not addressed	Implement heat stress monitoring and provide hydration stations.	N/A	N/A
Noise Exposure	Inadequate mitigation	Provide hearing conservation training and regular audiometric testing.	N/A	N/A
Chemical Exposure	Not addressed	Ensure proper labeling and Material Safety Data Sheets (MSDS) are available for all chemicals.	N/A	N/A
Vague Guidance	Not addressed	Develop clear work instructions and checklists for all tasks.	N/A	N/A
Communication Issues	Not addressed	Establish regular safety meetings to discuss hazards and updates.	N/A	N/A
Overconfidence	Not addressed	Conduct training on risk awareness and the importance of following procedures.	N/A	N/A

Failure mode analysis:

Current Control	Failure Mode of the Control	Effect of Failure	Cause of Failure	Recommended Action
Lockout/Tagout Procedures	Permit not obtained or expired	Risk of accidental equipment start-up	Poor communication or oversight	Implement a tracking system for permits with reminders.
PPE Requirements	PPE not used or inadequate	Increased risk of injury	Lack of enforcement or training	Conduct regular audits and refresher training on PPE usage.
Work Instructions	Instructions not followed	Increased likelihood of accidents	Vague or unclear guidance	Revise instructions for clarity and ensure they are accessible.
Communication Processes	Miscommunication among team members	Increased risk of errors	Lack of structured communication	Establish a communication protocol for all team members.
Emergency Response Procedures	Inadequate emergency response	Delayed rescue or response	Lack of training or drills	Conduct regular emergency response drills and training sessions.
Tool Availability	Tools not available or inadequate	Increased downtime	Poor inventory management	Implement a tool tracking system to ensure availability.
Training Verification	Inadequate training records	Unqualified personnel performing tasks	Poor record-keeping	Develop a centralized training database for tracking.
Staging Area Management	Waste not properly managed	Increased risk of slips and falls	Inadequate housekeeping	Assign personnel for regular cleanup and waste management.

Current Control	Failure Mode of the Control	Effect of Failure	Cause of Failure	Recommended Action
Pre-Job Safety Briefings	Briefings not conducted	Increased risk of oversight	Time pressures or scheduling conflicts	Make safety briefings mandatory and schedule them in advance.
Hazard Communication	Hazards not communicated effectively	Increased risk of injury	Lack of signage or awareness	Implement clear signage and regular hazard communication updates.