

Work scope details:

Title: Routine Maintenance of the Steam Production System

Work Scope Summary: This work plan outlines the routine maintenance activities for the Steam Production Systems and related equipment at ORNL. The tasks involve various trades including millwright, pipefitting, electrical, instrumentation, utility mechanics, laborers, boilermakers, carpenters, and insulators, focusing on preventive maintenance and minor repairs.

Key Work Scope Components:

- Millwright tasks: pump maintenance, mechanical repairs, filter replacements.
- Pipefitting and welding tasks: piping repairs, valve maintenance, welding operations.
- Electrical tasks: voltage readings, troubleshooting, minor wiring installations.
- Instrumentation tasks: repairing controllers, performing calibrations.
- Utility mechanic tasks: concrete repairs, floor leveling, masonry work.
- Laborer tasks: material handling, cleanup, operating tools.
- Boilermaker tasks: maintenance of pressure vessels, cleaning tubes.
- Insulator tasks: insulation replacement and disposal.

Relevant previous events and lessons learned:

Event Title	Event Summary	Lessons Learned	Reference Link
Boiler Explosion at XYZ Facility	A boiler explosion occurred due to improper maintenance and failure to follow safety protocols, resulting in injuries and significant damage.	Importance of adhering to maintenance schedules and safety protocols to prevent catastrophic failures.	OSHA Incident Report
Electrical Shock Incident	An electrician suffered an electrical shock while performing maintenance on live equipment due to inadequate lockout/tagout procedures.	Emphasizes the necessity of strict adherence to lockout/tagout procedures to ensure safety during electrical maintenance.	NRC Event Report
Asbestos Exposure During Insulation Removal	Workers were exposed to asbestos while removing insulation without proper protective measures, leading to health risks.	Highlights the need for proper training and PPE when handling hazardous materials like asbestos.	CDC Asbestos Guidelines
Fall from Height During Scaffolding Work	A worker fell from improperly erected scaffolding while performing maintenance at height, resulting in serious injuries.	Reinforces the importance of proper scaffolding procedures and fall protection measures.	OSHA Scaffolding Standards
Equipment Failure During Maintenance	A critical piece of equipment failed during maintenance due to lack of preventive measures and inspections, causing downtime.	Stresses the need for regular inspections and preventive maintenance to avoid equipment failures.	DOE Maintenance Guidelines

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 a material handling training program and use mechanical aids for heavy lifting.	OSHA Material Handling	N/A
Electrical Hazards	Inadequate lockout/tagout procedures	Establish and enforce strict lockout/tagout protocols before any electrical work.	OSHA Lock out/Tagout	N/A
Asbestos Exposure	Not addressed	Conduct an asbestos survey and provide appropriate PPE and training for workers handling insulation.	CDC Asbestos Guidelines	N/A
Confined Space Entry	Not addressed	Implement a confined space entry program including training, permits, and monitoring.	OSHA Confined Spaces	N/A
Noise Exposure	Inadequate hearing conservation measures	Conduct noise assessments and provide hearing protection where noise levels exceed permissible limits.	OSHA Noise Standards	N/A
Heat Stress	Not adequately addressed	Implement a heat stress prevention program including hydration and rest breaks.	OSHA Heat Stress	N/A
Overhead Work	Not addressed	Require the use of hard hats and establish exclusion zones below overhead work areas.	OSHA Fall Protection	N/A
Poor Lighting	Inadequate lighting measures	Assess lighting levels and improve illumination in work areas to enhance visibility and safety.	OSHA Lighting Standards	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 energization leading to injury	Lack of training or awareness	Conduct regular training and audits of lockout/tagout compliance.
PPE Requirements	PPE not used or inadequate	Increased risk of injury from hazards	Poor communication or lack of enforcement	Implement a PPE compliance checklist and regular inspections.
Pre-Job Safety Review	Incomplete safety briefings	Workers unaware of hazards leading to accidents	Time pressures or distractions	Allocate sufficient time for thorough safety briefings before work begins.
Training and Competency Verification	Inadequate training records	Workers may lack necessary skills leading to unsafe practices	Poor documentation practices	Establish a centralized training management system to track training and competencies.
Emergency Response Procedures	Lack of clear emergency procedures	Delayed response to incidents leading to increased severity	Poor communication or lack of drills	Conduct regular emergency drills and review response procedures with all personnel.
Tool and Equipment Availability	Tools not available or malfunctioning	Delays in work and increased risk of improvised solutions	Inadequate inventory management	Implement a tool tracking system to ensure availability and maintenance of tools.

Current Control	Failure Mode of the Control	Effect of Failure	Cause of Failure	Recommended Action
Communication Processes	Vague guidance on tasks	Misunderstandings leading to unsafe practices	Poor communication channels	Establish clear communication protocols and ensure all personnel are informed.
Work Instruction Compliance	Work instructions not followed	Increased risk of accidents due to improper procedures	Lack of supervision or oversight	Assign a supervisor to ensure compliance with work instructions and safety protocols.