

Work scope details:

Title:** PREAPPROVED WORK PLAN FOR THE STEAM PRODUCTION SYSTEM

Work Scope Summary:

The objective of this work package is to conduct routine maintenance activities on the Steam Production Systems and related equipment. These activities include troubleshooting, basic parts replacement, and repairs that do not require additional written instructions, though task leader direction may be necessary. The work encompasses various tasks performed by millwrights, pipefitters, welders, electricians, instrumentation and control technicians, utility mechanics, laborers, boilermakers, carpenters, and insulators.

Key Work Scope Components:

- Millwright tasks: pump maintenance, mechanical repairs, filter replacements, preventive maintenance. - Pipefitter and welding tasks: piping repairs, valve replacements, pressure relief valve installations, welding. - Electrician tasks: voltage readings, breaker operations, electrical repairs, panel installations. - I&C tasks: instrument maintenance, diagnostics, calibration, control wiring installations. - Utility mechanic tasks: concrete repairs, floor leveling, masonry work, preventive maintenance. - Laborer tasks: material moving, site cleanup, equipment support, waste collection. - Boilermaker tasks: pressure vessel maintenance, gasket installations, tube cleaning. - Carpenter tasks: scaffolding construction, containment structures, work platforms. - Insulator tasks: insulation replacement, abatement, disposal, encapsulation.

**

Relevant previous events and lessons learned:

Event Title	Event Summary	Lessons Learned	Reference link
Inadequate Work Controls during Refrigeration Repair	On March 14, 2014, a technician from ACME Refrigeration arrived at Brookhaven National Laboratory to perform preventive maintenance on an ice machine. The CulinArts Food Vendor Manager notified him that a walk-in cooler in Building 30 was not operating correctly and asked him to troubleshoot that equipment instead. While troubleshooting the cooler, the technician did not follow the required lockout/tagout process, did not use required fall protection, operated a breaker without required personal protective equipment and training; and improperly secured a junction box leaving wires exposed and energized. Upon discovery of the unsafe electrical condition, the equipment was made electrically safe, and an investigation was initiated.	Lessons Learned will be issued addressing proper work planning and controls for shop maintenance activities. Issued Lessons Learned 24590-WTP-LL-MGT-09-0249	Link

Maintenance Work Without Authorization	<p>On June 4, 2024, Infrastructure personnel performed unauthorized maintenance tasks which impacted operations in the facility. Instrument Technicians were assigned to perform Work Order 56327217, Vacuum Receiver Preventative Maintenance (PM). The technicians attempted to contact the Facility Representative (FR) but were unsuccessful. They completed the PX-3169, Facility Structures, Systems, & Components Work Authorization Permit, by writing, by phone, listing the FRs name. Work authorization stated work could be performed beginning June 3 through completion. The technicians thought since this was a routine preventive maintenance work order, the work they were performing would not impact operations. The FR was not aware of the work being performed and did not authorize the work. While performing the PM, the technicians turned off a vacuum pump, as stated in the work order instructions, causing an alarm to sound on the equipment. When the alarm sounded the equipment automatically stopped operating, as expected. Explosive Technology personnel performed a procedure to manually recover the process.</p>	<p>Periodically review original preventative maintenance (PM) bases to ensure PMs are still valid and that the proper level of maintenance is being performed to maintain equipment reliability.</p>	Link
Preventative Maintenance Basis Reviews Can Prevent Costly Equipment Failures and Unscheduled Down Time	<p>Periodically review original preventative maintenance (PM) bases to ensure PMs are still valid and that the proper level of maintenance is being performed to maintain equipment reliability.</p>	<p>Periodically review original preventative maintenance (PM) bases to ensure PMs are still valid and that the proper level of maintenance is being performed to maintain equipment reliability.</p>	Link

Missing Hazards:

Hazard	Missing or Inadequate Mitigation in Current Work Control Document	Recommended Mitigation for Revision	Reference link	SBMS Link

Thermal Stress	No specific controls for thermal stress identified	Implement exposure assessment, work/rest regimen, acclimatization, and environmental monitoring	N/A	Link
Inadequate Lockout/Tagout Procedures	No mention of inadequate LOTO procedures	Enhance training and adherence to LOTO protocols	OSHA Lockout/Tagout Fact Sheet	Link
Unauthorized Maintenance Work	No controls for unauthorized maintenance work	Develop a comprehensive maintenance plan and ensure adherence to OSHA standards	OSHA 29 CFR 1910.147	Link
Chemical Exposure	No specific controls for chemical exposure	Conduct risk assessments, implement control measures, and provide ongoing training	Chemical Safety Training	Link
Fall Hazards	No specific controls for fall hazards	Implement fall protection systems and training	OSHA Fall Protection	Link
Improper Use of Personal Protective Equipment (PPE)	No specific controls for improper PPE use	Conduct hazard assessments and ensure proper PPE selection and use	EPA Hazard Assessment for PPE	Link
High Workload and Time Pressure	No specific controls for workload and time pressure	Implement administrative controls and explore solutions to reduce time pressures	Safety in High-Pressure Environments	Link
Vague Guidance and Imprecise Communication	No specific controls for communication issues	Establish clear communication protocols and training	N/A	Link
Insufficient Preventative Maintenance	No specific controls for preventative maintenance	Establish a preventive maintenance program and track progress	OSHA Hazard Prevention	Link

Failure mode analysis:

Current control	Failure mode of the control	Effect of Failure	Cause of Failure	Recommended action

Written permits for the work activity	Permit not obtained or incomplete	Unauthorized work leading to safety hazards	Lack of awareness or oversight	Ensure all permits are reviewed and approved before work begins
Precautions, step warnings, Hold Points	Steps not followed or ignored	Increased risk of accidents or equipment damage	Human error or negligence	Reinforce training and supervision to ensure compliance
Personal Protective Equipment (PPE)	PPE not used or inadequate	Worker injury or exposure to hazards	Insufficient training or availability	Conduct PPE audits and provide training on proper usage
Work instructions for information	Instructions not followed or misunderstood	Incorrect task execution leading to system failure	Miscommunication or lack of clarity	Simplify instructions and conduct briefings before tasks
ORNL subject area requirements	Requirements not adhered to	Non-compliance with safety standards	Lack of enforcement or understanding	Regular audits and refresher training on standards
Discuss group/individual responsibilities	Roles not clearly defined	Confusion and inefficiency in task execution	Poor communication or leadership	Conduct regular team meetings to clarify roles
Follow work instructions & safety procedures	Procedures not followed	Increased risk of accidents or system failures	Complacency or lack of training	Implement a checklist system and conduct spot checks
Availability/location of materials, tools, etc.	Materials/tools not available or misplaced	Delays and inefficiencies in task completion	Poor inventory management	Improve inventory tracking and storage systems
Previous experiences / lessons learned	Lessons not applied	Repeat of past mistakes leading to failures	Lack of documentation or dissemination	Document and share lessons learned in team meetings
Response if work cannot be performed as planned	Inadequate response plan	Increased downtime and potential hazards	Lack of contingency planning	Develop and train on contingency plans for common issues
Potential error traps with the job	Error traps not identified	Increased likelihood of mistakes	Lack of foresight or analysis	Conduct thorough risk assessments and implement safeguards
Take a minute before: work start & leaving work area	Time not taken for safety checks	Missed hazards leading to accidents	Rushed work or lack of discipline	Encourage a culture of safety and mindfulness