

**Work scope details:**

Title: 7676 HVAC Repair Involving Unpermitted Confined Space

Work Scope Summary: - The task involves troubleshooting and repairing the heat pump located in the large conference room of cabin 7676. This requires entry into the cabin's crawlspace, which is identified as a non-permitted confined space.

Key Work Scope Components: - Troubleshooting the heat pump system - Repairing the heat pump - Accessing the cabin's crawlspace - Ensuring safety measures for non-permitted confined space entry

**Relevant previous events and lessons learned:**

Event Title	Event Summary	Lessons Learned	Reference link
MO-039 (222-S) Heating Ventilation and Air Conditioning (HVAC) Unit Troubleshooting	Refrigerant Equipment Service craft personnel performed work on an incorrect HVAC unit in the 200 West Area. The work package instructed them to troubleshoot and repair HVAC unit #1 on MO039. However, the work was performed on HVAC unit #1 on MO037. A fact-finding meeting was held.	Prior to initiating maintenance work, the work scope must be clearly understood. The hazards must be identified and analyzed to identify critical steps. This ensures the scope of work is understood, hazards are analyzed, and the correct component/equipment is identified prior to the start of work.	<a href="#">Link</a>
Work Being Performed in a Confined Space May Create Hazards that Create Permit-Required Confined Space Conditions	This incident highlights the need to better identify and maintain awareness about work activities that could change the status of confined spaces. The M&O contractor had not anticipated that abrasive blasting would generate particulates that could reach hazardous levels when its representative issued the daily work permit for work in a non-permit status confined space.	Identification and communication processes for classifying and reclassifying confined spaces should be strengthened to address the potential that work activities may change the conditions within those spaces.	<a href="#">Link</a>
Wall-Hung Electric Room Heater Failed Control Components	Several control circuit component failures have been discovered for wall-hung electric room heaters at Soil & Groundwater Remediation Project pump and treat facilities. Care should be taken to confirm replacement components will perform as expected. Component failures may occur during energized testing and troubleshooting activities.	Ensure replacement components will perform as expected to prevent failures during energized testing and troubleshooting activities.	<a href="#">Link</a>

**Missing Hazards:**

Hazard	Missing or Inadequate Mitigation in Current Work Control Document	Recommended Mitigation for Revision	Reference link	SBMS Link
Incorrect HVAC unit identification	Not addressed	Implement proper identification and lockout/tagout procedures for HVAC units to prevent accidental activation and exposure to hazardous chemicals.	<a href="#">HVAC Safety Hazards</a>	<a href="#">Link</a>
Component failure during troubleshooting	Not addressed	Develop a comprehensive equipment maintenance and inspection program to identify potential failures before they occur. Implement training for staff on recognizing signs of component failure.	<a href="#">OSHA Hazard Prevention</a>	<a href="#">Link</a>
Time pressures and distractive environment	Not addressed	Establish clear work schedules and provide training on managing distractions. Implement procedures to ensure tasks are completed safely without rushing.	<a href="#">Potential Hazards</a>	<a href="#">Link</a>
Vague guidance and imprecise communications	Not addressed	Develop clear and precise communication protocols and training programs to ensure all staff understand safety procedures and hazard communications.	<a href="#">OSHA Hazard Communication</a>	<a href="#">Link</a>
Non-permitted confined space conditions	Not addressed	Conduct assessments to identify non-permitted confined spaces and provide training on recognizing and controlling potential hazards in these spaces.	<a href="#">Non-Permit Confined Space Training</a>	<a href="#">Link</a>

**Failure mode analysis:**

Current control	Failure mode of the control	Effect of Failure	Cause of Failure	Recommended action
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Written permits for the work activity	Permit not obtained or incomplete	Unauthorized work leading to safety hazards	Miscommunication or oversight in permit process	Implement a checklist to ensure all permits are obtained and reviewed before work begins
Personal Protective Equipment (PPE)	PPE not used or inadequate	Increased risk of injury or exposure to hazards	Lack of awareness or availability of appropriate PPE	Conduct PPE training and ensure availability of necessary equipment before work starts
Work instructions & safety procedures	Instructions not followed or unclear	Increased likelihood of errors and accidents	Inadequate training or vague instructions	Provide detailed work instructions and conduct pre-job briefings to clarify procedures
ORNL subject area requirements	Non-compliance with safety standards	Potential regulatory violations and safety risks	Lack of awareness or understanding of requirements	Regular audits and training sessions on ORNL safety standards
Discuss group/individual responsibilities	Roles and responsibilities not clearly defined	Confusion and lack of accountability during work	Poor communication or planning	Conduct team meetings to clearly define and communicate roles and responsibilities
Lock/Tag/Verify (LTV) procedures	Failure to properly lock/tag equipment	Risk of accidental energization and injury	Inadequate training or procedural lapses	Implement strict LTV training and verification processes
Confined Space Entry Permit	Permit not completed or atmospheric testing not done	Risk of asphyxiation or toxic exposure	Oversight or lack of proper equipment	Ensure confined space permits are completed and atmospheric testing is verified before entry
Emergency Response Plan	Inadequate response to emergencies	Increased severity of incidents	Lack of training or unclear emergency procedures	Regular emergency drills and clear communication of response plans