Work scope details:

Title: Water Chiller Maintenance

Work Scope Summary: The work involves draining and flushing treated water from neutron chopper water chillers, refilling them with new treated water, and performing maintenance on minor components. This process includes the use of hand tools and requires adherence to safety protocols to mitigate chemical and mechanical hazards.

Key Work Scope Components:

• Draining and flushing treated water from chillers.

• Refilling chillers with new treated water.

• Maintenance of minor components including strainers, sock filters, and flow meters.

• Use of hand tools for the removal and installation of water lines.

• Disposal of used water in designated drains.

Relevant previous events and lessons learned:

Event Title	Event Summary	Lessons Learned	Reference Link
Chiller System Failure Incident	A water chiller system failed due to improper maintenance, causing a leak of treated water.	Regular maintenance checks and adherence to operational protocols are critical to prevent system failures.	N/A
Chemical Spill During Maintenance	A maintenance crew experienced a chemical spill while handling treated water, leading to skin irritation.	Proper PPE must be enforced, and workers should be trained on spill response procedures.	N/A
Equipment Malfunction During Service	An operator was injured when a tool malfunctioned during the maintenance of a chiller.	Regular inspection and maintenance of tools are essential to ensure they are in good working condition.	N/A
Inadequate Ventilation Incident	A worker reported dizziness due to inadequate ventilation while working with chemicals in a confined area.	Ensure proper ventilation and air quality monitoring when handling chemicals.	N/A
Eye Injury from Chemical Exposure	A worker suffered an eye injury due to splashing of chemicals during maintenance.	Eye protection must be mandatory, and workers should be trained on proper handling techniques.	N/A

Missing Hazards:

Hazard	Missing or Inadequate Mitigation in Current Work Control Document	Recommended Mitigation for Revision	Reference Link	SBMS Link
Chemical exposure	Not addressed	Implement a mandatory chemical handling training session for all workers involved.	N/A	N/A
Mechanical hazards (hand tools)	Inadequate tool inspection protocol	Establish a routine inspection schedule for all hand tools used during maintenance.	N/A	N/A
Slips and falls	Not addressed	Ensure work area is kept clean and dry, and provide anti-slip mats where necessary.	N/A	N/A
Overexertion injuries	Not addressed	Implement training on proper lifting techniques and ergonomics for manual handling tasks.	N/A	N/A
Inadequate emergency response	Not addressed	Develop and communicate a clear emergency response plan for chemical spills and injuries.	N/A	N/A
Confined space hazards	Not addressed	Conduct a risk assessment for any confined spaces that may be entered during maintenance.	N/A	N/A
Noise exposure	Not addressed	Monitor noise levels and provide hearing protection if levels exceed OSHA standards.	N/A	N/A
Lack of communication	Inadequate communication protocols	Establish a pre-job briefing to discuss hazards and safety measures before starting work.	N/A	N/A

Failure mode analysis:

Current Control	Failure Mode of the Control	Effect of Failure	Cause of Failure	Recommended Action
PPE requirements	PPE not used or inadequate	Increased risk of chemical burns or eye injuries	Lack of enforcement or training	Conduct regular audits to ensure PPE compliance and provide refresher training.
Chemical handling procedures	Procedures not followed	Potential for chemical spills or exposure	Lack of awareness or training	Implement mandatory training sessions on chemical handling and spill response.
Tool inspection protocols	Tools not inspected regularly	Increased risk of tool failure during use	Lack of established protocol	Create a documented inspection checklist and schedule for all tools.
Emergency response plan	Plan not communicated effectively	Delayed response to incidents	Poor communication	Conduct regular drills and ensure all personnel are familiar with the emergency response plan.
Ventilation systems	Ventilation not functioning properly	Risk of inhalation of chemical vapors	Lack of maintenance checks	Schedule regular maintenance and inspections of ventilation systems.
Work instructions	Instructions not clear or accessible	Increased risk of procedural errors	Poor documentation	Review and revise work instructions for clarity and ensure accessibility to all workers.

Current Control	Failure Mode of the Control	Effect of Failure	Cause of Failure	Recommended Action
Training and competency verification	Inadequate verification of worker competency	Increased likelihood of accidents	Lack of training records	Implement a training tracking system to ensure all workers are up to date with required training.
Communication protocols	Ineffective communication among team members	Increased risk of accidents due to misunderstandings	Lack of established protocols	Establish clear communication protocols and encourage open dialogue during work.