

Work scope details:

Title: BL 13 Move HV Box to Safe Configuration

Work Scope Summary: - The task involves repositioning the BL 13 HV Box to a configuration that ensures safety during inspection processes.

Key Work Scope Components: - Repositioning the BL 13 HV Box - Ensuring the configuration is safe for inspection - Preparing the area for inspection - Conducting a safety check post-movement - Coordinating with inspection personnel

Relevant previous events and lessons learned:

Event Title	Event Summary	Lessons Learned	Reference link
Workers identified an unexpected energy source while performing a safe to work check on the 6701 building junction box.	<p>On June 20, 2018, electricians performing a safe to work check on a junction box at the 6701 building identified an unexpected energy source.</p> <p>There were no injuries, workers were wearing prescribed PPE and there was no potential for exposure to the hazardous energy due to the junction box configuration. The work began on June 15, under work package 2M-115627-C, to replace the inbound security gate. A safe to work check was performed at the same location, at the beginning of each shift and when a new worker arrived at the job site. Locks and tags were applied to the breaker box inside the 6701 building and the lockout/tagout was left in place. Workers returned to the 6701 building on June 20 and performed a safe to work check where 120 volts was identified. A second instrument was obtained, used and verified the presence of 120 volts. The work was stopped. The system was placed in a safe configuration. Notifications to management were initiated.</p>	<p>Electricians followed all procedures and work package instruction. It is only through the adherence to the LOTO process the electricians involved with this event were able to discover this intermittent source of electrical power.</p>	Link

<p>SLAC National Accelerator Laboratory, Linac Coherent Light Source I and Facility for Advanced Accelerator Experimental Tests II</p>	<p>On February 13, 2024, the Area Manager in the Linac Coherent Light Source I and the Facility for Advanced Accelerator Experimental Tests II Laser Facility at SLAC National Accelerator Laboratory visited Building 002C (B002C) to check on completion of a recent crane inspection and discovered that the 480-volt alternating current disconnect switch controlling power for crane 188 in B002C had been operated with out-of-date arc flash labels. The disconnect switch lever for crane 188 was normally kept in the OFF position with an administrative lock on the disconnect switch cover unless the crane was actively in use. It was determined that the disconnect switch was operated and the administrative lock was removed the last time the crane was in use, during the February 6 inspection of crane 188. SLAC initiated an investigation to better understand the causes that led to the event. Facilities & Operations Management implemented compensatory measures requiring that crane inspections would only proceed with escort by a Qualified Electrical Worker and the most experienced crane escort at the highest maintenance worker level. On February 27, SLAC Management escalated the investigation from a fact-finding to an Independent Root Cause Analysis. Issues from the investigation will be managed via the SLAC Issues and Improvements Management System.</p>	<p>HFEF representatives immediately asked the subcontractor to close the box for safe configuration while explaining that the circuits they were working on were not on a Lockout/Tagout to isolate the energy. The Construction Field Representative was notified and came to the facility to walk down the incident. A Stop Work was issued to the subcontractor and the crane was put into a safe configuration. A safety violation was issued to the subcontractor. A critique was held and a corrective action plan was requested from the subcontractor and will need to be approved prior to releasing the Stop Work by Battelle Energy Alliance.</p>	<p>Link</p>
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<p>Oak Ridge National Laboratory, Building 7900</p>	<p>On February 15, 2024, when attempting to start primary pressurizer pump PU-4A during a maintenance activity, the pump started and then immediately tripped off. The pump remained out of service and troubleshooting commenced. Maintenance troubleshooting efforts determined the motor bypass contactor had failed. The bypass contactor is identified as a Safety Class component. This was a conservative failure of this component, and the safety function of the system was not compromised. The motor bypass contactor was replaced, and post maintenance testing was performed successfully. The maintenance activity was then completed, and the pressurizer pump was returned to service.</p> <p>A causal analysis will be conducted. Corrective actions will be developed and tracked to closure.</p>	<p>Electricians followed all procedures and work package instruction. It is only through the adherence to the LOTO process the electricians involved with this event were able to discover this intermittent source of electrical power.</p>	<p>Link</p>
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Assessment Discovers Unsafe Equipment Configuration	<p>An electrical inspection at Pacific Northwest National Laboratory (PNNL) in 2010 determined that furnace heating elements in a lab space presented an exposed energized electrical hazard with shock potential if the furnace was turned on inadvertently while staff were working in the furnace. To mitigate this hazard, a label was affixed to the front of the furnace that instructed the user to turn the furnace off before opening the door to the exposed electrical elements. In 2017, an Electrical Safety assessment of the lab determined the label affixed to the front of the furnace did not sufficiently mitigate the hazard, and it was replaced with a new label that directed the user to unplug the furnace before opening the door to the exposed electrical elements. However, during a February 2021 assessment, the furnace was found in an unsafe configuration (plugged in with the door open, exposing the electrical elements).</p>	Identifying and correcting the label suggests that at the time, the Cognizant Space Manager left the furnace in a safe configuration.	Link
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Missing Hazards:

Hazard	Missing or Inadequate Mitigation in Current Work Control Document	Recommended Mitigation for Revision	Reference link	SBMS Link
Ergonomic conditions (Contact Stress, Vibration, Posture, Force, Repetitive Motion)	Lack of specific ergonomic assessments and interventions	Conduct ergonomic assessments, implement workstation adjustments, provide ergonomic training and tools	N/A	Link
Unexpected energy source	Lack of specific controls for unexpected energy sources	Implement lockout/tagout procedures, provide training on energy source hazards	OSHA Standard	Link

Out-of-date arc flash labels	Lack of regular updates and inspections for arc flash labels	Establish a schedule for regular inspection and updating of arc flash labels	N/A	Link
Unsafe equipment configuration	Lack of detailed procedures for equipment configuration checks	Develop procedures for regular equipment configuration checks and adjustments	Hierarchy of Controls	Link
High workload and time pressures	Lack of controls for managing workload and time pressures	Implement workload management strategies, provide stress management training	CDC Psychosocial Hazards	Link
Distractive environment	Lack of controls for minimizing distractions	Implement measures to reduce distractions, such as designated quiet zones or noise-cancelling equipment	Hierarchy of Hazard Controls	Link
First time evolution	Lack of controls for new or unfamiliar tasks	Develop procedures for assessing risks associated with new tasks, provide training for first-time tasks	Hierarchy of Controls	Link
Vague guidance	Lack of clear and specific guidance for hazard mitigation	Provide detailed and specific guidelines for hazard identification and mitigation	N/A	Link
Overconfidence	Lack of controls addressing overconfidence in workers	Implement training to raise awareness of overconfidence risks, promote adherence to safety protocols	ECMag Article	Link
Imprecise communications	Lack of controls for ensuring precise communication	Develop communication protocols, provide training on effective communication skills	N/A	Link

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	Ensure all permits are obtained and verified before work begins
Personal Protective Equipment (PPE)	PPE not used or inadequate	Increased risk of injury to personnel	Lack of awareness or availability of PPE	Conduct a PPE check and ensure availability and proper use
Work instructions & safety procedures	Instructions not followed or misunderstood	Unsafe work practices leading to accidents	Inadequate training or unclear instructions	Provide clear instructions and conduct training sessions
ORNL subject area requirements	Non-compliance with hazard controls	Exposure to uncontrolled hazards	Lack of awareness or understanding of requirements	Regular audits and training on ORNL requirements
Discuss group/individual responsibilities	Responsibilities not clearly defined	Confusion leading to unsafe practices	Poor communication or lack of role clarity	Conduct pre-job briefings to clarify roles and responsibilities
Availability/location of materials, tools	Materials/tools not available or misplaced	Delays and unsafe improvisation	Poor planning or inventory management	Ensure all materials and tools are available and organized before work
Response if work cannot be performed as planned	Inadequate response to unexpected issues	Increased risk of accidents or delays	Lack of contingency planning	Develop and communicate contingency plans
Potential error traps	Error traps not identified or mitigated	Increased likelihood of mistakes	Time pressures, distractive environment, high workload	Implement error mitigation strategies and conduct regular reviews
Elevated Work - Fall Prevention System	Fall prevention system not in place or faulty	Risk of falls leading to injury	Inadequate setup or maintenance of fall prevention systems	Verify and maintain fall prevention systems regularly
Ergonomic Conditions	Poor ergonomic setup	Worker discomfort or injury	Lack of ergonomic assessment	Conduct ergonomic assessments and adjust workstations accordingly