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Subject: Blue Alert: Reactivation of Surplus Facility Systems

Title: Reactivation of Surplus Facility Systems

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Lessons Learned: Original equipment utilized by operational systems in surplus facilities that has been idle for many years, may not be suitable for safe operation in their existing conditions. Facilities that were constructed over a half a century ago may have served several missions that required system changes throughout the years. The records of these changes are often not available. This can cause problems with bringing systems such as gantry cranes back into service after many years of sitting idle. This can especially be problematic for the electrical components of a system. The activity of re-instating the U Plant canyon crane to a limited operational use status resulted in the following major lessons learned:

1. For components of operational systems in surplus facilities, one cannot assume that a deactivated component was ever in complete compliance with the codes that existed when the facility was in service.
2. Projects should not rely on previous risk based surveys of pre-existing conditions when changing the status of a previously deactivated system.
3. For electrical components of the system, a complete review of the system including design, construction, and modifications to the system should be made to ensure changes did not impact other areas of the system.

The above lessons learned will be incorporated into work planning for all electrical, and surveillance and maintenance activities. This will be communicated to all S/M&T personnel through the use of Project Management Implementing Instructions (PMIIs).

Description: The gantry crane inside the 221-U Plant, chemical-processing facility, at the Hanford Site was required to support characterization efforts. Processing at the facility was discontinued in the 1950's; although, the crane was used sporadically to move equipment and cover blocks after that time. In the early 1990's the electric service to the U Plant canyon was changed and the connection to the crane's existing system was left intact. Since the effectiveness of any existing ground path could not be determined, this caused a potential grounding problem that posed potential safety issues to workers in and around the crane. This issue did not surface until a National Electric Code (NEC) inspection was conducted as a result of questions raised by the DOE Facility Representative.

The 221-U Plant canyon crane was put back into service during FY98 in order to support characterization efforts associated with the Canyon Disposition Initiative (CDI). The electrical and mechanical systems of the crane were inspected for operability and defective parts were replaced as needed. The crane was not evaluated against NEC requirements at this time as no changes to the system configuration were anticipated. A readiness assessment was conducted and identified an electrical

concern with the thermal loading capability for the crane breaker under load, which was resolved under a deficiency report prior to starting the crane.

On the morning of November 18, 1999, smoke was observed emanating from a small motor on the gantry of the 221-U canyon crane. A maintenance crew and the DOE/RL Facility Representative (FR) were present in the canyon and observed the wisps of smoke coming from the small motor. The crew was in the canyon to perform the preventative maintenance inspection of the wire rope on the 75-ton hoist. The lead operator immediately shut down the job and the personnel exited the canyon. The FR noted several items that related to missing covers on j-boxes, wires extruding outside of boxes that did not appear properly terminated, in addition to the smoke from the one motor on the optics system. These concerns were related to the Field Support Area Supervisor later that day. The incident was recorded in an off-normal report (RL-BHI-IFSM-1999-0001) as requested by the FR. Many of the conditions noted were on systems that were not operational and/or believed non-operational. The motor that produced the smoke was on the right hand optical motor train, which was believed to be non-operational because it was not going to be utilized during the CDI.

Standard administrative controls used by the S/M&T workers consider all wires in these surplus facilities to be energized unless proven otherwise. This control is necessary because it was not feasible to walk down all systems in the old facilities during pre-existing condition analysis to define hazards. In general, the facilities were noted as not being compliant with current standards and codes in many areas.

Personnel involved in the work responded appropriately when the incident occurred. The crane was being moved off the crane maintenance platform when the smoke was observed emanating from the optics motor on the gantry. The lead operator had the crane brought back over the maintenance platform into a safe configuration and had all personnel exit the canyon. These actions were in accordance with the work package safety documentation and worker training. Whenever conditions change from what was expected in the work package, work should stop until the issue can be resolved.

The FR also had concerns that the incident may be a near miss because of the proximity of the personnel in the canyon when the smoke was seen. A fact-finding critique was held to evaluate these concerns and a determination was made that there was not a near miss situation. The fact finding investigation revealed that the fuses for one of the right hand optics motors had not been pulled and the switch was in the on position.

Issues identified in the fact finding raised the question of NEC code requirements for the limited use of the crane. BHI and DOE/RL Environmental Restoration management agreed to conduct an NEC inspection of the U Plant canyon crane. The results of the inspection would be evaluated from a safety perspective to identify deficiencies that would be unacceptable for limited use of the crane for the characterization effort.

The Site Authority having Jurisdiction for Electrical Issues at Hanford conducted the resulting NEC inspection. The inspection noted sixteen violations of the current NEC and fourteen of these were also violations of the 1940 NEC requirements. The 1940 NEC requirements were reviewed because the crane was vintage 1930's and installed at U Plant in the early 1940's. The Site Authority noted that nine of the sixteen items would require resolution, for the limited use by the CDI, before the crane could be operational again. The FR requested that three of the remaining seven items also be addressed before the crane was declared operational.

Actions Taken or Recommended:

- * The first action taken was to suspend all activities associated with the crane until the electrical issues were resolved. The FR initiated this through a stop action to BHI.
- * An NEC inspection of the gantry crane should be conducted. (The preparation to support the NEC inspection discovered additional concerns for the grounding of the crane. While the original items noted were readily addressed, the more detailed review brought more serious concerns to the forefront.)
- * All the NEC items identified by the Site Authority, as required before limited operations, will be completed. The additional items required by the FR and the remaining of the sixteen items will also be completed.
- * The NEC inspector and the FR will inspect the repairs and provided a recommendation to the DOE/RL Project Manager to remove the stop action condition on the crane.
- * The S/M&T Project will conduct a self-assessment of their remaining large facilities to identify any conditions that may have been consistent with issues identified for the canyon crane.
- * The S/M&T Project will continue to emphasize in training to the work force that all wires in surplus facilities should be treated as live until proven otherwise.
- * A lessons learned will be prepared, upon completion of the crane electrical upgrade activities, for the canyon crane incident to alert others to issues in utilizing existing systems in surplus facilities.
- * BHI management will develop a policy/position for the use of existing operational systems in surplus facilities.

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References: RL--BHI-IFSM-1999-0001