

Project Hanford Lessons Learned

Title: Instrument Technician Receives Shock While Performing Instrument Calibration

Date: December 19, 2005

Identifier: 2005-RL-HNF-0043

Lessons Learned Summary:

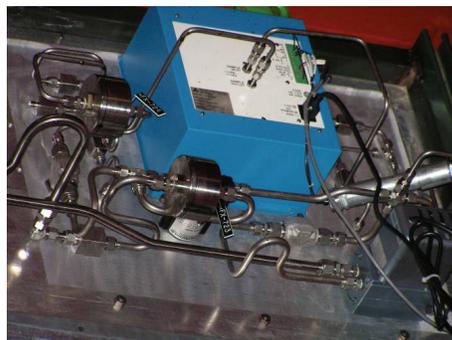
Personnel need to use a clear thought process to analyze hazards associated with conducting work, especially on equipment that is energized or while working in the vicinity of energized equipment. Hazards associated with a job can change from day-to-day, even minute-to-minute, and especially from location-to-location. What works one day may not be appropriate the next day due to subtle changes in conditions. Any time an aspect of a job changes the hazards associated with that job must be re-evaluated. Incidents concerning personal health or safety that occur while performing work must be reported immediately. Completion the work prior to reporting an incident is not acceptable.

Discussion of Activities:

An instrument technician was assigned to perform a calibration of an oxygen sensor on a reactor refueling machine. No lockout and tagout was required because the instrument was a plug-in unit. The instrument technician unplugged the unit, disconnected, removed it from the refueling machine, and took it to the shop to rejuvenate the sensing unit. After rejuvenation the instrument technician re-installed the oxygen sensor on the refueling machine and re-connected it. The instrument technician then plugged the unit in, turned it on, and started a purge to remove oxygen from the sensor. The purge ran through the night.



Front ASL Panel With Power Connection



Rear Panel/Exposed Terminal Board

The next day the instrument technician performed a zero-span gas check and noted that the instrument reading on the refueling machine computer was not present. The instrument technician contacted the engineer. After a brief discussion the engineer suggested that a possible problem might be that the wire feeding the computer from the back of the oxygen sensor could be loose. The instrument technician performed a visual check on the terminal strip on the back of the sensor and noticed a loose wire. The instrument technician reached under the oxygen sensor without unplugging the instrument to access the terminal strip on the back of the instrument and received an electrical shock when his hand brushed against the "sonolert" (alarm

module) terminal, energized with 110-volts, resulting in a mild electrical shock. The instrument technician reconnected the loose wire, completed the calibration work on the oxygen sensor, and then reported the shock to his supervisor.

Analysis:

The apparent cause of the event is Human Performance Less Than Adequate (LTA), Skill Base Error, Incorrect performance due to mental lapse. The instrument technician had unplugged the oxygen sensor prior to disconnecting the wiring and removing the unit for rejuvenation. Prior to plugging the unit back in, the wiring was re-connected. The oxygen sensor was purged overnight to reduce the oxygen within the sensor prior to completing the calibration. The following day the instrument technician had a mental lapse and did not fully evaluate his actions, failing to unplug the oxygen sensor prior to touching the terminal board while he was checking the wiring. The work procedure for this work required that the sensor be deenergized (unplugged) prior to starting work. When the calibration was completed, the sensor was still malfunctioning. The instrument technician attempted to verify the wiring configuration without unplugging the instrument. During this check, the technician inadvertently contacted energized wiring and was shocked.

This incident and an incident recorded on 10/15/05 share similar casual factors. The causal factors for this incident are similar to those reported in EM-RL--PHMC-FFTF-2005-0003 (8-25-05), Human Performance Less Than Adequate (LTA), Skill Based Error, Check of work was LTA. Human Performance Less Than Adequate (LTA), Skill Base Error, Incorrect performance due to mental lapse.

Recommended Actions:

Managers should reinforce the importance of following the Hazardous Energy Control process at all times including the immediate reporting of any incident related to personal safety or health.

Estimated Savings/Cost Avoidance: Not Evaluated

Priority Descriptor: YELLOW/Caution

Work / Function: Conduct of Operations / Maintenance

Hanford Functional Categories: Associated Causal Factors - A3B1C03 - Incorrect performance due to mental lapse

Hazard: Personal Injury / Exposure / Electrical

ISM Core Function: Define the Scope of Work, Analyze the Hazards, Develop and Implement Hazard Controls, Perform Work Within Controls

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Authorized Derivative Classifier: N/A

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Keywords: Electrical, Shock

References: EM-RL--PHMC-FFTF-2005-0005, EM-RL--PHMC-FFTF-2004-0001