

## LNBL C-5 Electrical Safety Corrective Action Plan 2009

**Finding Statement :** LBNL has not ensured that all of the requirements of LBNL PUB-3000, Chapter 8, Electrical Safety, Chapter 18, *Lockout/Tagout and Verification*, and NFPA 70E, *Standard for Electrical Safety in the Workplace*, for arc flash protection, PPE and zero voltage verification have been effectively implemented.

### Managers Responsible for Correcting Finding:

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### C-5 Causal analysis:

1. The threshold for generating detailed hazard information on individual job work orders through the Task Hazard Analysis is set too high for the hazards to be included on some of the individual work orders. (2, 12)
2. In cases where the threshold was set correctly, there was a lack of necessary detail.(2, 12)
3. Electrical safety training is not tailored to the job. (1,5,8,12 )
4. FA Supervisors do not comprehend all of their responsibilities.(9,12)
5. FA Supervision span of control effectively dilutes the ability to observe the work in the field. (4,9,10,11,12)
6. FA supervision process does not adequately include a quality control of safety practices i.e. field validate and verify. (4,6,9,12)
7. LBNL did not evaluate whether training was effective. (1,9,12)
8. LBNL does not fully ensure subcontractors follow Lab and DOE regulations/requirements. (3,4,6,7,12)
9. LOTO Classroom training is not craft specific and has insufficient practical components. (1,4,5,12)
10. FA Management does not adequately verify that field work complies with LOTO requirements. (1,3,4,6,9,11,12)

### C-5 Action Plan Summary:

#### Immediate / Compensatory Actions:

1. Facilities Division Refrigeration Mechanic brought HSS identified LOTO issue (Live-Dead-Live meter verification) to his supervisor the day following discovery. Supervisor held Tailboard meeting to determine the extent of the problem among the Facilities Division craft personnel. All Refrigeration Mechanics and Plant Maintenance Technicians employees were briefed, issue was reviewed and the field practice was altered to include Live-Dead-Live.

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2. The Task Hazard Analysis (THA) element of the Maximo work order system in the Facilities Division has been modified to generate a Task Hazard Analysis, which increases greater detail, at a lower threshold level, including any construction activity.
3. Anyone doing hands-on work on a construction project must submit JHA, THA, and permits, as appropriate to the Construction Manager for review and approval prior to beginning work.
4. Construction Safety is observing construction subcontractor LOTO's, when possible. The purpose is to ensure that LOTO is performed correctly and to document the extent of condition (EOC) of any field implementation deficiencies.
5. Changes to the work authorization process now require AHD's when work is identified involving exposure to hazardous electrical energy/ LOTO verification.
6. Energized Electrical Work Permit (EEWP) and LOTO permits made mandatory for all subcontractors performing electrical testing or LOTO

**Actions to Prevent Reoccurrence:**

7. Facilities Division will develop a construction subcontractor orientation process to communicate gaps between LBNL work and private sector work standards and expectations.
8. EH&S will revise current LOTO and electrical safety training to provide more comprehensive and practice-based instruction.
9. Facilities Division will revise its safety walkaround program to ensure that electrical safety and LOTO tasks are observed and that management ensures this work is performed safely.
10. Facilities Division will evaluate the supervisor span of control and allocate the resources necessary to ensure effective safety walkarounds.
11. Facilities to communicate expectations of LOTO/electrical safety roles and responsibilities to their supervisors.
12. Facilities Division will conduct effectiveness reviews of these corrective actions