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From: Meredith Brown <racer@lanl.gov>  
Subject: Yellow Alert: Electrical Near Miss

**Title: YELLOW - Improper Electrical Installation Results in Near Miss**

Identifier: INEEL Lessons Learned # 98181  
Date: March 26, 1998

**Lessons Learned Statement:**

Electrical circuits must be locked/tagged out, tested, and wrung out individually. Affected employees must be trained to properly conduct tests and zero energy verifications.

**Discussion of Activities:**

An electrician at the INEEL Radioactive Waste Management Complex (RWMC) witnessed an electrical arc and heard a breaker trip while reconnecting 120-V power conductors to a drum heating enclosure. The electrician stopped work and immediately reported the incident to the foreman and facility maintenance supervisor. The circuit had been locked out and tagged out and the electrician had verified zero energy before disconnecting the 120-V power conductors the previous day.

Electrical personnel later determined that the tripped breaker was incorrectly wired in the panel box. Two circuits were crossed, causing them to supply power to the incorrect drum heating enclosures according to the drawings and conductor labeling. This wiring error could have resulted in an electrical hazard causing serious injury.

A check or wring out of a relay panel downstream of the power panel should have found the wiring error after the panel was initially wired. The circuits had been checked, but all ten circuits were energized at the same time, rather than checking each circuit individually.

**Recommended Actions:**

1. Lockout/tagout, testing, and wring outs of circuits should be performed on individual circuits.
2. All electricians at RWMC will attend refresher training, emphasizing a) circuit checks and wring outs done one at a time to verify proper wiring connections, and b) methods of verifying zero energy.

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Functional Categories (DOE): Fire Protection, Maintenance, Occupational Safety and Health,

Safety, Training and Qualification

Functional Categories (User-Defined): Electrical, Fire Protection, Maintenance, Occupational Safety and Health, Training/Qualification/Education

Key Word(s): electrical arc, tripped breaker, wiring, wiring outs

References: N/A

Follow-up Action: Information in this report is accurate to the best of our knowledge. As a means of measuring the effectiveness of this report please notify Terry Pierce at (208)526-4288 or by electronic mail at [txp@inel.gov](mailto:txp@inel.gov) of any action taken as a result of this report or of any technical inaccuracies you find. Your feedback is important and appreciated.