

Date: Wed, 01 Sep 1999 10:20:13 -0600
From: Meredith Brown <racer@lanl.gov>
Subject: Yellow Alert: Penetration Hardware and PPE Issues

Title: Penetration Documentation Should Identify PPE for All Work Stages, Hardware Should Match Penetration Depth

Identifier: 1999-LA-LANL-ESH7-0014 Date: 09/01/99

LESSONS LEARNED: Work planning and/or permitting documents should specify each step necessary to complete a job and exactly what personal protection equipment (PPE) applies to each step to ensure that workers do not prematurely discard PPE. Work planning and/or permitting documents for penetration work should also match hardware to penetration depths. Additionally, if power detection equipment is used in an area where penetration work is to be performed, circuits in the area should be energized during scanning to improve detection results.

DISCUSSION: A worker drove a screw through a hole in a metal switchbox inside a wall and contacted a 120-volt energized line while installing a modular furniture mounting track. The screw penetrated the insulation on the line, causing a short circuit. The worker, who was not wearing protective gloves, was pushed away from the wall but otherwise uninjured. The wire and the screw were burned in half. The worker was using a battery-powered screw gun to install a manufacturer-provided screw that was one inch longer than the depth of the hole that had been predrilled according to specifications in the approved penetration permit for the job. Although the workers who drilled the holes wore electricians' gloves and eye protection and used insulated tools, the worker who installed the screws into the holes did not wear protective equipment because this step was not considered penetration work.

A power detector was used to locate wires inside the wall before the work began, and the metal switch box was identified. However, no electrostatic current was identified at the box location because the light switch was off when the wall was surveyed. The personnel who performed the survey also estimated that the box was outside the area that would be impacted by the installation work based on their knowledge of switch boxes and because a 1.5 inch drilling depth was specified in the penetration permit.

RECOMMENDATIONS: Future penetration permits for modular furniture installation work will restrict the length of screws to not exceed the depth of the drilled holes, and they will require workers to wear dielectric gloves for drilling AND screw driving work.

Because the installation materials provided by the modular unit manufacturer were for generic installations in wood frame and wallboard buildings rather than concrete block wall structures, which are commonly found at the Laboratory, installers have also been instructed to only use screws provided from the Los Alamos warehouse.

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DOE FUNCTIONAL CATEGORY: Engineering Design and Construction (Non-nuclear)

KEYWORDS: PPE, penetration, modular furniture, power detection, scanning

REFERENCES: ALO-LA-LANL-TRITFACILS-1999-0001

FOLLOW-UP ACTIONS: Information in this report is accurate to the best of our knowledge. As a means of measuring the effectiveness of this report, please contact the originator of significant action(s) taken as a result of this report or of any technical inaccuracies you find. Your feedback is appreciated.