OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

October 25, 2021 **Lessons Learned** 2021-UTB-ORNL-0028

Electrical Shock During Trouble-shooting Activity

Topics: Electrical Shock, Laboratory Safety, Time Pressures, Scope Creep
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OE Document Number: 15780

Statement: Researcher receives a minor electrical shock while trouble-shooting an energized piece of equipment under the direction of the manufacturer's technical support representative.

Discussion: A research staff member discovered a highly utilized group-owned research instrument was not operating as expected. Upon consultation with the manufacturer's technical support representative, it was recommended that the voltage on a circuit board be measured to determine the cause of the equipment failure. Due to COVID, the difficulty in getting a service technician on-site, and the need to make progress on their research, the researcher felt self-imposed time pressures to perform the component testing themselves without consulting electrical or safety personnel. Although the Research Safety Summary and their training allows the researcher to work on equipment less than 50-volts, the diagnostic test seemed simple enough and the circuit board was low voltage. However, the researcher was not aware that the circuit board was located near an unguarded 140-volt power source. Thus, while testing the circuit board, the researcher, who was not wearing appropriate work gloves and other PPE for live electrical work over 50-volts, received an electrical shock.

Analysis: The researcher performed work outside the scope of their training and work control authorization. By removing the instrument cover on an energized piece of equipment, they exceeded their authorization for testing low-voltage (<50 V) equipment. Their self-imposed time-pressures to quickly get the equipment working so they could make research progress as well as the perceived low risk, lead to an inaccurate assessment of the hazards of the situation and unsafe actions.

Recommended Action: Researchers should be reminded that self-imposed time pressures and advice from instrument technical support representative should not override work authorization and safety training. In this case, a qualified electrical worker should have been contacted to remove the instrument cover and troubleshoot. Researchers should employ the SCOR principles in all activities.

Safe Conduct of Research (SCOR) Principles:

1. "A healthy aspect is maintained for what can go wrong." Always perform work while being vigilant to changing conditions or circumstances.
2. "A questioning attitude is cultivated." Question your own actions and/or intentions when performing work. Even an apparent simple task can have negative consequences.
3. "Hazards are identified and evaluated for every task, every time." Understand the scope of your work and realize what you are allowed and not allowed to do.

References: ACTS Issue: 0.41366; Action: 0.41366.9

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