

Construction News Sense



Recent Electrical Incidents

See Page 2 for an article stressing the importance of ensuring controls for hazards be reviewed by Sandia's IH staff.



Recently, the Facilities Management and Operations Center (FMOC) and some of the line organizations at Sandia National Laboratories (SNL) have noticed an upward trend in electrical safety events. Electrical safety is a key element in the continued success of the Laboratories, and this trend is an indicator that SNL needs to re-emphasize, to both the internal and the subcontractor workforce, its expectations for electrical safety and quality electrical work.

Electrical workers are specialists trained and licensed to perform electrical work. They perform daily "contact work," which exposes them to electrical energy not usually encountered by other workers. Lock-Out/Tag-Out errors, electrical wiring errors, electrical demolition activities, and legacy equipment/installations are daily events that must be managed. Almost half of all electrical incidents at SNL occur among construction, demolition, and maintenance subcontractors.

Common causes of incidents involving electrical workers are:

- Not fully understanding electrical hazards and circuitry;
- Making mistakes during the initial installation/repair of wiring systems. Such mistakes (legacy issues) may expose future workers to unexpected hazards in unusual locations (e.g., above suspended ceilings, on male cord caps, or on equipment chassis);
- Configuration management deficiencies and inaccurate "as-built" drawings/blueprints;
- Failing to stop work when conditions encountered differ from what is expected (scope creep); making assumptions that increase the risk of injury;
- Failing to verify the zero-energy state of a circuit (Lockout/Tagout violations and other less-than-adequate practices).

Administrative failures have also caused incidents among subcontractors, including a lack of clear guidance from supervisors about how to correctly perform a task; failure to properly analyze hazards as required; and failure to follow requirements, specifications, permits, procedures, or regulations.

FMOC has implemented many corrective actions to address electrical safety concerns and expects the same from its subcontractors. Subcontractors are urged to

examine their processes and procedures and the work habits/activities of their personnel.

A few examples of recent or upcoming FMOC corrective actions are:

- Reviewing all current penetration permit processes to look for weaknesses in those processes;
- Comparing/benchmarking interior saw cutting techniques used by three other companies;
- Researching technologies to ensure detection means of spotting and electrical safety equipment are state-of-the-art for environments at SNL;
- Notifying project managers, construction managers, inspectors, and safety personnel about incidents and instructing them to reduce risks through wider outages as appropriate;
- Conducting lessons-learned meetings at the Quarterly Safety Seminar. The project manager recently conducted an all-hands meeting with all contractors involved in the Heating System Modernization (HSM) Project;
- Distributing NEMA plug and receptacle configuration charts to all electrical subcontractors and their electricians as a reminder of the proper wiring for various types of equipment; and
- Conducting an all-management meeting to discuss ES&H concerns associated with recent events.

Electrical Safety Updates and Changes

Although using proximity testers/tic tracers to detect the presence of electrical current is considered a best practice, these testers are not designed for or allowed in testing for zero voltage. They should be used only as a diagnostic tool in understanding an electrical system.



Randy Fellhoelter has been added to the FMOC team to provide more in-field supervision of electrical work. Randy has extensive electrical background and will be a tremendous asset to FMOC.

Greg Kirsch, 4827

Lessons Learned - Near Miss of Subcontract Personnel Exposure to Organic Solvents during Painting Operations

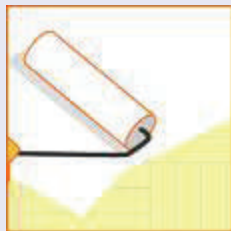
Those who fail to learn from history are doomed to repeat it

That statement, which has been attributed to several sources, can apply not only to our country but also to our personal lives. For example, imagine you're a baseball pitcher and you remember when you faced a certain batter, he had a hard time hitting the curve balls you threw but was able to blast fastballs over the fence. Your best hope of striking out this batter is to throw curve balls!



We can learn from our experiences: a good spot to catch fish or hunt quail; which streets to avoid during heavy traffic; which restaurants have the hottest chili; or the best time of day to go shopping. When you make such choices based on experience, you are using "lessons-learned." This is not quite the same concept as when, after applying discipline, your father stated, "I hope you have learned your lesson." Not repeating some events is so important to the Department of Energy (DOE) there is an organized "lessons-learned" program. Lessons are shared throughout the DOE system of operations to reduce the possibility of a "repeat occurrence."

We can learn several lessons from an incident that occurred here at SNL. A subcontractor was prepping a floor for application of an epoxy floor coating. The contractor mopped on isopropyl alcohol (IPA) to clean the floor. Later that day, workers mixed and applied small batches of a two-part epoxy paste containing organic solvents over cracks in the



floor. Next, they mixed and began applying a two-part epoxy sealer to the floor. During the application of the paste and sealer, other workers in an adjacent building noticed an odor. After consulting the area industrial hygienist (IH) and contractor personnel, the prime contractor suspended the work activity until further investigation could be performed.

Although the IH evaluation indicated workers were not overexposed to solvent vapors above the TLV© during these activities because their exposure time was limited and respiratory protection had been used, had the application of the epoxy sealer continued as planned, worker exposures could have exceeded recommended safe levels. The incident was categorized as a "near miss," and SNL performed an occurrence investigation in accordance with the appropriate DOE process.

The investigation identified several issues. First, although the Contractor Specific Safety Plan (CSSP) did identify the epoxy in a list of chemicals and a letter identified the painting subcontractor by name, neither document mentioned the floor coating activity, the hazards, or the controls. As a corrective action, the new Construction Hazard Identified and Mitigation Administrative Procedure, AP-216 was issued. The procedure outlines the roles and responsibilities for FMOC construction workers and ES&H support personnel regarding the use of the newly developed IH Activity/Task List. Working with epoxy coatings is listed as an IH activity/task that requires an IH evaluation.

Second, the FMOC project manager failed to invite the SNL IH

supporting FMOC construction operations to the pre-construction meeting. Had the IH attended the pre-construction meeting, existing controls might have been discussed and additional controls or reviews might have been identified prior to the work being performed. As a corrective action, FMOC updated ES&H Specification 01065 for Construction Contractors to include a requirement that FMOC construction prime contractors submit a list of chemical-containing products, materials, etc., that are to be used on a construction project prior to performing work involving the use of such products.



Another issue addresses the importance of ensuring controls are in place for hazards that may affect personnel not directly involved in work activities (e.g., occupants of nearby buildings). Although the painting subcontractor took steps to control solvent exposures to workers, the subcontractor did not address the potential migration of vapors and odors through the existing trench into the adjacent building. Had the SNL IH supporting FMOC construction activities been contacted to evaluate hazards and controls associated with applying the epoxy floor coating, the need to control migration of vapors and odors into adjacent buildings might have been identified.

If we fail to learn from our mistakes or the mistakes of others, we make similar mistakes again and again. When you hear of an incident, or if you are involved in one, see what you can learn from the event. Some history you just should not repeat.

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