

REMEDIATION MANAGEMENT



HSSE SHARED LEARNING

UTILITY LOCATING WITH TRACER SIGNAL

Shared Learning: Electrical Safety/Ground Disturbance

Business Unit: Remediation Management

Location of Incident: Active Retail Station

Date: May 2010

Brief Account of Shared Learning:

The morning of May 17, 2010, Contractor staff was on site with a private utility locator (Locator) to identify subsurface utilities and/or structures in preparation for forthcoming drilling activities. As part of the investigation, the Locator was tracing the electrical service to the forecourt lighting. The Locator approached a light standard in the southern corner of the site. When he approached, he noticed that the electrical access port cover at the base of the light was missing and that the wires had been previously “pulled” out of the access port. He identified a black, white, and green wire sticking out of the port. He was knowledgeable with electrical wiring techniques and understood that the green wire was the grounding conductor in place for safety reasons (per NEC Article 250) and he should be able to expose the copper of the ground lead (without breaking the connection) to attach a signal transmitter for tracing the wire back to the circuit breaker panel (across the forecourt).

Actual Outcome:

When the Locator attempted to remove the wire nut at the wire splice for the green wire, he received a “mild” shock. The line locator immediately initiated Stop Work, explained the situation to the Contractor staff, and after discussion developed a plan to safely push the wires into the light standard without further incident and to partially isolate the wires from subsequent exposures. The Locator was wearing gloves and not injured or burned. The station manager was informed of the incident and the deficiency with the cover plate on the light standard since changes/modifications were under the control of the retail operations.

What Went Well:

Both the Locator and Contractor personnel were familiar with H&S protocol regarding incidents. Stop Work was initiated immediately, the incident was communicated, and notifications followed both internal and external protocol. The Locator was wearing the PPE specified in the work risk assessment, and exposure to electricity was risk assessed reducing the potential severity of the incident.

What Improvements Were Made:

Without a properly installed electrical system (such as found in this incident), there is no way of determining if the ground lead is energized since the ground lead is connected to all metallic equipment served by the circuit and the wire and equipment may be at the same energy state. The use of a voltmeter and relying on the meter reading(s) to test if a ground wire and the associated “grounded” equipment are energized may

present a false sense of security to the staff if the ground lead has somehow become energized to a state that is below the trigger point of the upstream protective device (i.e. circuit breaker).

Tracing energized power cables (single- and three-phase 50-60Hz) is difficult without the use of an outside signal being introduced to the wires. Utility locators should, at minimum, be trained to a level of awareness with energy

Utility locating procedures were modified in the following way:

1. Utilize locating procedures that do not require attachment of a radio signal transmitter, where possible.
 - a. Energize all electrical circuits prior to starting locating process, and use equipment that will locate energized electrical wiring.
 - b. Utilize inductive radio generating device that can induce a signal in the wire without being physically attached to it.
2. If attachment to electrical wires is necessary, power to lines should be off, and LOTO procedures followed (including using meter to verify that line is not carrying power) prior to attempting to attach any device to the wiring.
3. Metal piping is often utilized as an electrical ground, and has the potential to be carrying electrical current. Under incorrect electrical installations or faults, the piping maybe energized.. Piping should be checked with a volt meter prior to connecting radio signal generating equipment to it to verify that it is not carrying a current.

Questions? Contact: Danny Monson (714) 670-5060

