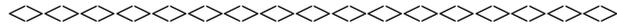


Date: Tue, 15 Dec 1998 08:49:09 -0500
From: "Eubanks, Cynthia M. (EUB) " <eub@bechteljacobs.org>
Subject: Yellow Alert: Subcontractor Cut Through Energized 480V Electrical Cable During Excavation

The following Bechtel Jacobs Company, LLC Lesson Learned was generated as a result of an incident that occurred at the Portsmouth Project. It is being disseminated for as a reminder of the potential hazards that exist when inadequate as-built drawings are not available. If you have any questions, please contact Joanne Schutt at (423)574-1258, e-mail=s6u@ornl.gov



TITLE: Subcontractor Cut Through Energized 480 Volt Electrical Cable During Excavation

IDENTIFIER: Y-1998-OR-BJCPORT-1201
DATE: December 3, 1998

LESSONS LEARNED STATEMENT: "As-built" drawings have been proven to be inadequate to ensure personnel safety when excavating or penetrating surfaces. Many modifications and changes made over the years have not been accurately incorporated into the "As-Built". Therefore, drawings alone are not adequate to ensure safety and should be used as a reference only. Subsurface utility detection instruments must be used to survey the work area prior to all excavation/penetration activities whenever underground and hidden electrical utilities are known or suspected to exist and potential energy sources should be deenergized. Excavation and penetration activities are inherently risky and requires caution, alertness, and awareness of the workers at all times and should be emphasized as part of the pre-job briefing.

DISCUSSION: On September 30, 1998, while attempting to repair a Recirculating Hot Water Line subcontractor personnel severed an energized 480V cable with a track hoe during excavation activities. The associated circuit breaker operated correctly and interrupted the ground fault caused by the excavation equipment. The cable was later identified as the power source for a sewage lift station. Associated documentation and permits were in order. The blueprints did not indicate a direct burial cable in this area. Subsite surveys were performed prior to and during the excavation. The survey was unable to identify this cable. Excavation activities were ceased and authorities were notified of the incident. Electricians were contacted to identify the cable and tag out the breaker. A critique of the event indicated that engineering and administrative controls were in place. A "stop work" was issued on all excavation activities until an investigation could be completed. No injuries resulted from this incident. The incident took place as a result of a subcontractor performing work on a utility system which was leased to them by the DOE. The subcontractor is required to provide utilities to the DOE under the terms of the lease agreement. In addition to providing these services, the subcontractor is also responsible for maintaining the system.

ANALYSIS: The direct cause was determined to be Design Error, mistake in equipment/material selection. The subsurface utility detection instrument used for this

excavation may not be adequate to identify all utilities in all cases.

The root cause was determined to be Design Error, mistake in drawing/specification/data. The accuracy and consistency of the "As-Built" drawings on plant site are not adequate since there have been many modifications and changes over the past 45 years that have not been incorporated into the "As-Built" drawings. The drawings are really only reference drawings and should only be used as such.

RESOLUTION/RECOMMENDED ACTIONS: Portsmouth Bechtel Jacobs Company LLC is performing an engineering evaluation of subsurface utility detection instruments in order to select a device that may be used to accurately locate underground and hidden utilities prior to excavations or penetrations. Engineering and Technical Services will then make a recommendation to the Project Manager and Field Services regarding whether or not to acquire use of this equipment on Bechtel Jacobs Company LLC projects.

Working copies of the blueprints that are used in the field will be redlined annotating the location of the 480 volt line and indicating the conductor is direct burial, therefore, preventing reoccurrence.

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PRIORITY DESCRIPTOR: Yellow Caution

KEYWORDS: Energized, 480Volt, Cable, Excavation, Penetration

REFERENCES: ORO--BJC-PORTENVRES-1998-0017

DOE FUNCTIONAL CATEGORY: Engineering Design and Construction (Non-Nuclear); Maintenance; Safety

BJC FUNCTIONAL CATEGORY: EC Engineering & Construction; EL - Electrical; MA Maintenance; MS - Mechanical/Structural

HAZARD CATEGORY: Excavation & Trenching; Electrical; Mechanical/Structural

WORK ACTIVITY: Facility Maintenance; Power & Utilities; Safety/Safety Significant Systems

FOLLOW-UP ACTION: Information in this report is accurate to the best of our knowledge. As means of measuring the effectiveness of this report please notify Joanne E. Schutt at (423)574-1248, e-mail at s6u@ornl.gov of any action taken as a result of this report or of any technical inaccuracies you find. Your feedback is important and appreciated.