



### Poor Job Planning Results In Electrical Worker Fatality

# 2

On April 30, 2007, at the Bangor Naval Submarine Base, an apprentice lineman was electrocuted when he touched a line truck that had become energized when the truck boom came in contact with an overhead power line. The victim was part of a line crew that was attempting to set a communication pole near 12,470-volt power lines. (IBEW Local 77 Accident Investigation Report)

A line crew from a Navy subcontractor was on the base to re-route 10 spans of 3-phase primary overhead conductors to an underground service and remove the overhead lines. Because of scheduling problems with the Navy, the subcontractor was unable to provide all the materials needed to dead-end the overhead wire. As a result, the subcontractor's general foreman borrowed the material from the Navy's High Voltage Department in exchange for replacing a 30-foot-tall communications pole.



*Figure 2-1. Work area showing the pole in the brush*

The crew assigned to replace the pole consisted of one foreman, one journeyman lineman, and the apprentice, who had joined the crew a month before. The replacement pole was loaded on the line truck with the butt over the cab so that it could be moved and set in an area of brush on a hillside (Figure 2-1).

The foreman conducted a job briefing to discuss where they needed to set up the line truck in order to dig the hole with the truck's auger. Because the height of the primary power lines was 26 feet, the foreman decided it would be best to set the pole near the base of the existing pole. The apprentice drove the line truck into position and the foreman climbed up to the controls of the truck and started digging the hole with the auger. After the hole was dug, he re-stowed the auger on the truck in preparation to unload the pole and stage it in a position to be set.

The apprentice climbed onto the truck and hooked up the winch line to the setting chain that was around the pole. The pole was going to be placed with the top uphill in the brush. The foreman then raised the pole off the truck with the boom while the lineman helped



*Figure 2-2. Incident reenactment (touching the energized truck and the grounded metal building)*

to guide the pole from the rear of the truck. The foreman raised the boom to its maximum position and swung it clockwise, towards the rear of the truck. As this was being done, the apprentice climbed down from the truck and walked around to the driver's side to assist the lineman. As the lineman looked up at the boom, he saw the hydraulic lines of auger touch a primary phase. At this instance, while walking between the line truck and a metal building, the





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apprentice placed one hand on the truck and one hand on the metal building as he stepped over a pallet of electrical cables. Current flow passed through the chest and heart of the apprentice (Figure 2-2). At the same time, the foreman heard an arching sound and immediately swung the boom away from the primary phase.

The lineman saw the apprentice leaning over and asked if he was alright. The apprentice responded that he was not. The lineman called 911 as the foreman climbed down from the truck to assist the apprentice. The apprentice's pulse was weak and he was having difficulty breathing. The foreman removed the apprentice's burned work gloves and saw that his hands were also burned. At this point, the apprentice stopped breathing and had no pulse. The foreman and lineman started administering CPR until medics from the naval base arrived and took over the CPR. Finally, the medics tried to revive him with their defibrillator, but were unsuccessful.

Investigators from the local electrical union identified the following issues that could have been done to prevent this accident.

- The job should have been engineered, planned, and made ready for the work crew. The work was performed as a favor in exchange for materials and the site was congested and filled with obstacles.
- The job briefing should have focused on the line truck boom being in close proximity to the primary zone because the energized overhead power lines were 26 feet above the ground. Also, not touching the line truck while the boom is in the primary zone should have been discussed with the crew.
- The crew should have used protective line barriers, rubber gloves, and grounded the line truck. The apprentice was not wearing rubber electrical gloves.
- Additional manpower could have been used so the foreman would be able to focus his entire attention on the job as a safety watch and spotter.

- The crew did not have an Automated External Defibrillators (AED) with them, which could have changed the outcome of the accident if employed quickly.

Since 2000, there have been 47 events reported in ORPS regarding incursions with overhead electrical power lines. These events involved crane and excavator booms, dump truck beds, and forklift masts. The voltage in some of these incursions was as high as 13,000 volts. The following example occurred while removing a utility pole.

On April 18, 2006, at the Savannah River Site, a 55-foot temporary pole slipped from the grapple hooks of a boom truck and hit a phase of a 13.8 kV power line. An electrical subcontractor was in the process of removing the power pole from a sloped area 23 feet from an overhead power line, when the ground surface gave way. The boom truck operator lifted the pole out of the ground and started to rotate the boom away from the direction of the power line to lay the pole down when the incident occurred. (ORPS Report EM-SR--GOSR-GOSR-2006-0002)

Investigators determined that the operator failed to close the pole guide dogs after he lifted the pole from the ground. Also there were too few workers assigned to the task (i.e., a spotter should have been available).

In 2004, a lack of job planning and hazards identification resulted in the fatality of a contractor for the Western Area Power Administration, which resulted in a Type A Accident Investigation (OE Summary 2004-21). In that accident, a 20-year-old apprentice lineman was electrocuted from induced voltage when he removed personal grounds out of sequence on a de-energized 230-kV power line. The Type A Accident Investigation Board identified many contributing causes including inadequate job planning for not identifying hazards and mitigation measures in a project-specific stringing and grounding plan, as well as reduced resources with less than adequate experience levels and no supervision. (Not reported in ORPS)



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*These events underscore the importance of adequate planning when work is to be performed around overhead electrical hazards. Adequate resources need to be assigned to support the safe operation of equipment near these types of hazards. In addition, job planning should address work area issues such as congestion or obstacles that could jeopardize worker safety. Pre-job briefings need to thoroughly address all potential hazards and stress the use of proper protective equipment and PPE. It is important that your workers are knowledgeable of the dangers imposed by overhead electrical hazards and that your organization's safety policies regarding proximity to high-voltage power lines are consistent with the requirements of [29CFR1910.333](#), Electrical – Selection and Use of Work Practices.*

**KEYWORDS:** *Fatality, electrocution, electrical safety, job planning, protective barriers, congestion, defibrillator*

**ISM CORE FUNCTIONS:** *Define the Scope of Work, Analyze the Hazards, Develop and Implement Hazard Controls, Perform Work within Controls*

