



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Painter Electrocuted in Virginia

FACE 87-40

Introduction:

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR) is currently conducting the Fatal Accident Circumstances and Epidemiology (FACE) Project, which is focusing primarily upon selected electrical-related and confined space-related fatalities. The purpose of the FACE program is to identify and rank factors that influence the risk of fatal injuries for selected employees.

On April 17, 1987, a 27-year-old painter (the victim) was electrocuted while he attempted to wrap plastic around an insulator in preparation of painting a steel structure in a substation.

Contacts/Activities:

Officials of the Occupational Safety and Health Program for the Commonwealth of Virginia notified the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR) concerning this fatality and requested technical assistance. This case has been included in the FACE Project. On May 5, 1987, a DSR safety specialist met with the compliance officer conducting the investigation for the Commonwealth and a company representative. Comparison workers were interviewed and photographs were obtained.

Overview of Employer's Safety Program:

The victim was a temporary full-time employee of an employment service which contracts to perform various types of jobs throughout the area. The company manager is assigned safety responsibility for employees on a collateral duty basis. Employees receive verbal and written safety rules/instructions and training is accomplished by on-the-job instruction and/or structured classroom training depending on the work tasks required.

Synopsis of Events:

On April 15, 1987, a utility had contracted an employment service to paint a steel structure in one of their substations. Two representatives of the employment service (a foreman and a crew leader) met with a representative from the utility to discuss which area of the substation was to be painted. During the discussion a tour of the substation was conducted; however, the crew leader, who was to be involved in the actual painting, did not participate. During this tour two structures

were identified: 1) a de-energized 34.5 kV structure to be painted and 2) an energized 11 kV structure to be avoided. Instructions were given to avoid the 11 kV circuit structure because the system was energized. It was also decided that inclement weather would prohibit painting that day, but painting would start at a later date, weather permitting.

Two days later a painting crew consisting of five employees (four workers and the crew leader) arrived at the substation. The crew leader was previously instructed "to start painting on the structure to the right as you enter the substation gate." The crew entered the substation by using a key they had obtained earlier. When the crew entered the substation they looked at the structure on the right (the de-energized 34.5 kV circuit) and decided the system was energized. The crew was not familiar with electrical substations and misinterpreted the presence of the ground connections that grounded the circuit to assure no induced voltages would be present. They then proceeded to the 11 kV energized circuit where they saw the disconnects were open and decided this system was de-energized. Again unfamiliarity with the electrical substation caused the crew to misinterpret the condition created by the open disconnects. (The open disconnects only isolated the 11 kV circuit from the other circuits.)

A ladder was positioned on the east side of the 11 kV structure and the four workers ascended to the top of the structure. The first worker (the victim) proceeded to the southwest corner of the structure where he attempted to wrap the insulators with plastic to protect them during painting. The victim was standing on a steel beam approximately 8" in width and reaching to wrap an insulator when he contacted an 11 kV conductor. The victim's body provided a path to ground through the steel structure and he was electrocuted. The victim fell 22' 6" to the ground.

Cause of Death:

The coroner's report stated cause of death as electrocution.

Recommendations/Discussion:

Recommendation #1: Access to substations should be prohibited unless qualified personnel are present.

Discussion: The painting crew entered the substation by using a key which had been provided earlier. Substation personnel were not present, since it was a holiday for utility employees. Access to energized substations should not be permitted without the presence of qualified personnel.

Recommendation #2: Contractors and employees of contractors should obtain verbal or written authorization before beginning work near energized facilities.

Discussion: When work is to be performed in a substation that is energized, authorization should first be obtained from a designated representative of the utility. Energized sections of the substation should also be identified to employers and employees performing any type of work in the vicinity of the energized facility on the same day that the work is to be performed.

Recommendation #3: Employers should require employees to use fall protection when work is to be performed above heights of six feet.

Discussion: Proposed rules in the Federal Register Vol. 51 No. 227 for OSHA safety and health standards (1926.501(a)(1)(ii)) require that employees on floors, low-pitched roofs, and other walking/working surfaces with unprotected sides and edges six feet or more above lower levels shall be protected by the use of guardrail systems, body belt/harness systems, or safety net systems when the floor, roof, or other walking/working surface is less than 18 inches in width. In an incident of this nature, if the painter had received less than a fatal shock the probability exists that a subsequent fall of approximately 22' may have resulted in death.

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