



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Electronics Plant Employee Electrocuted in North Carolina

FACE 86-01

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. By scientifically collecting data from a sample of fatal accidents, it will be possible to identify and rank factors that influence the risk of fatal injuries for selected employees.

On September 19, 1985, an employee of an electronic component manufacturing company was electrocuted while explaining a test procedure to a fellow employee.

Contacts/Activities:

Officials of the Occupational Safety and Health Program for the State of North Carolina notified DSR concerning this fatality and requested technical assistance. This case has been included in the FACE Project. A DSR research team (a research industrial hygienist and a physician) visited the site of this fatality in cooperation with North Carolina OSHA officials for the purpose of conducting an epidemiologic evaluation. A meeting was held with representatives of the company and the State Occupational Safety and Health Program compliance officer who investigated this case. The job site was photographed by the NIOSH team. Interviews were conducted with two employees having the identical job classification as the victim. A next-of-kin interview was not conducted.

Background/Overview of Employer's Safety Program:

The company manufactures electronic components and employs approximately 650 workers. About 500 workers are employed in manufacturing departments. The victim worked in the testing department, which employs twenty workers with similar job classifications.

This company employs a manager with collateral duties in both quality assurance and safety. A safety committee also exists with members from both management and labor. Each department has a biweekly meeting, a portion of which is committed to safety. Employees are encouraged to suggest safety topics to be discussed.

This company has a written safety policy which is given to each new employee. It is read and signed by both the employee and the supervisor for which that employee will work. Safety training begins with orientation of the new employee to the manufacturing facility. This is done by supervisors who explain the safety policy and all rules and regulations. The safety training in the testing department then encompasses a three-phase process:

Phase 1: The new employee is paired with an experienced employee to observe the testing process. No actual testing is done by the new employee. This phase lasts approximately one month.

Phase 2: This phase allows the new employee to work along with experienced employees. This is done mostly by the new employee telling the experienced worker what to do prior to the experienced employee performing the task. This phase also lasts about one month.

Phase 3: This phase allows the new employee to do the work while being observed by the experienced worker and varies in length of time needed for completion.

The testing department has a written safety review that is specific to testing. Portions of this review state:

- Never assume that voltage is not present. Always verify this yourself.
- Never take anyone's word that voltage is not present. Always verify this yourself.
- Verify that all applicable electrical disconnects are open, then confirm absence of voltage using a known functioning and calibrated electrical voltage measuring instrument.
- Each electronic component requires individualized testing procedures.

Synopsis of Events:

On September 19, 1985, the victim (a 24-year-old male electronic technician) was performing tests on electronic equipment. At approximately 2:30 p.m. , a co-worker asked the victim for direction concerning the proper method to make hook-ups to the bus bars. (The bus bars are conductors that collect electrical current and distributes it to outgoing feeders.) The victim, who had just completed testing an identical component, responded by reaching into the component to indicate the bus bars to which the feeders were to be connected and inadvertently touched two of the bus bars. The victim came into contact with 380 volts. The power was disconnected by a co-worker and the victim dropped back from the equipment. He was treated with cardiopulmonary resuscitation at the testing site and was transported to a local hospital where he was pronounced dead. Burns were noted on fingers of each hand where he had contacted the bus bars.

The victim did not follow standard operating procedures in that he did not verify that voltage was not present. Employees are instructed to assume that voltage is present and to always check for voltage using a known functioning and calibrated electrical voltage measurement instrument. The victim was in his last week of the third phase of his training and had worked for the company six months. He was being observed by an experienced co-worker and should have been familiar with proper testing techniques.

Cause of Death:

The "official" cause of death is not known at this time since the coroner's report has not been received.

Recommendation/Discussion:

Recommendation #1: Hazard awareness should be stressed at safety meetings in such a manner that employees are totally cognizant of all energized sources.

Discussion: The company provides equipment, devices, and training to assure safety during electrical testing of components. Basic precautions about working around hazardous voltages are clearly stated in that each employee is responsible for checking that voltage is not present. The company expects work to be discontinued should any questions

arise about testing procedures, proper use of electronic equipment, or safety. The victim violated standard operating procedure for reasons unknown.

Recommendation #2: The testing procedure should be evaluated in an effort to eliminate any unnecessary exposure to unguarded live electrical parts.

Discussion: Employees are exposed to live electrical parts in excess of 50 volts during the testing procedure. This procedure varies for the individual system/component being tested and for this reason adequate protection from unguarded live parts can be extremely difficult to implement. However, the testing procedure should be further evaluated in an effort to identify methods to provide adequate safeguards to employees (i.e., interlocks, barriers, the use of automatic test equipment, etc.).

[Return to In-house FACE reports](#)

Last Reviewed: November 18, 2015

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