



Abstract of an Accident

94-7

ACCIDENT TYPE: ELECTRICAL ARC-FLASH MISHAP
INJURY: ONE FATALITY, TWO SERIOUS & TWO MINOR INJURIES
TYPE OF WORK: RENOVATION/MAINTENANCE
EQUIPMENT: 480 VOLT/3-PHASE POWER DISTRIBUTION SYSTEM

DESCRIPTION OF THE ACCIDENT:

A crew of five employees were reinstalling the first of ten 480 Volt secondary circuit breakers into an energized power distribution panel in a below pier electrical vault. Power to the vault had been turned off for ten months and energized the day before the mishap following standard insulation resistance testing. Immediately after installing the first circuit breaker a short circuit and subsequent arc flash-over occurred which engulfed one employee and partially burned two others in the vault with him. Two employees standing by outside the vault suffered smoke inhalation.

DIRECT CAUSE:

Equipment failed due to excessive moisture in the Glass Fiber Re-inforced Polyester (GFRP) molded insulating material between the three 480 Volt phases during circuit breaker installation.

CONTRIBUTING CAUSES:

- Employer did not perform a job hazard analysis.
- Less than adequate maintenance procedures. Written PM Package did not require electrical power to be off when installing/removing circuit breakers.
- Standard operating procedures for work were not in writing. Unwritten procedure did not require closing arc-barrier door when racking circuit breakers.
- The crew was not trained in proper procedures.
- Inspection and test methods did not indicate fault. Personnel were not adequately trained to find deficiencies.
- Fire resistant clothing was not provided.

LESSONS LEARNED:

- Employer should develop JHA based standard operating procedures prior to commencement of work.
- Employer should ensure employees are adequately trained on job requirements.
- Provide fire resistant PPE to personnel performing work on energized electrical equipment where arc flash is a hazard.
- Ensure testing procedures agree with situation requirements.

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