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Naval Facilities Engineering Command

Abstract of an Accident

98-8

ACCIDENT TYPE: Electrical Shock
INJURY: Permanent Partial Disability
TYPE OF WORK: High Voltage Electrical
EQUIPMENT: Electrical Distribution Panel

DESCRIPTION OF MISHAP

Employee was shocked by 7,200 Volts AC when electrical power unexpectedly routed through a transformer he was working on. Employee was part of a crew working on a transformer located in a substation. The transformer had been de-energized, isolated, and grounded on all legs except one that consisted of a fused cutout, which was opened, and the fuses left exposed. After making the transformer "safe", fellow workers began trouble-shooting auxiliary circuits to turn on power for heaters and lights within the transformer while other workers did unrelated work. When a circuit on the panel labeled "auxiliary power" was turned on, the distribution system back-fed electricity to the transformers' exposed fuses. The employee, standing directly in front of the fuses, was shocked immediately after actuation of the 120 Volts AC auxiliary circuit. Activating the auxiliary circuit directed power through an uncharted section of the distribution system to the transformer, which amplified it to 7200 Volts AC and energized the fuses where the employee was standing unprotected. The electricity entered the employees' back and exited through his right hand.

DIRECT CAUSE

- Failure to follow requirements of lockout/tagout/tryout procedures (1910.147 or .269) – Authorized person did not ensure all personnel were clear of equipment that might be affected before introducing a change in the (lockout/tagout/tryout) process.

INDIRECT CAUSES

- System owners did not ensure all circuits were indicated on distribution system drawings/one-line diagrams when the system was built or modified.
- No procedures for ensuring all circuits are identified and verified before treating as safe.

LESSONS LEARNED

- Supervisors and employees must fully understand and implement Energy Control Program requirements, including lockout/tagout/tryout procedures.
- Personnel must be protected during all operational phases, including trouble-shooting and experimental evolutions.
- System drawings, including one-line diagrams, must accurately identify all circuits to reflect system operation and function.

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