FINAL FACE REPORT

CALIFORNIA DEPT. OF HEALTH SERVICES
FACE REPORT: 93CA00801
DATE: APRIL 5, 1994

TO: **Director, National Institute for Occupational Safety and Health**

FROM: **California Fatality Assessment and Control Evaluation (FACE) Program**

SUBJECT: **Maintenance Worker Electrocuted While at Work on Top of a Water Tank in California**

SUMMARY

A 46-year-old Caucasian male maintenance worker (the victim) was electrocuted while at work on the top of a water tank. The victim worked for a non-profit organization which provided day training for mentally disabled adults. The victim's supervisor stated that on the morning of the incident, he (supervisor) had informed the victim that the water tank was leaking. They both had agreed that an outside contractor should be contacted to make the necessary repairs. After their conversation the victim went back to the water tank area to inspect it. At some point the victim made contact with the electrical conduit which supplied electricity to the water tank pump and was electrocuted. A coworker later found the victim lying on top of the electrical conduit in a wet grassy area in front of the water tank. Paramedics were called to the scene and the victim was taken to a local hospital where he was later pronounced dead. The CA/FACE investigator concluded that, in order

to prevent future similar occurrences, employers should:

- evaluate their current safety program and incorporate specific training procedures emphasizing the importance of controlling hazards in the workplace. These procedures should include, but not be limited to, conducting hazard evaluations before initiating work at a job site and implementing appropriate controls; and
- provide a lockout/tagout system for all electrical maintenance work.

INTRODUCTION

On September 9, 1993, a 46 year-old male maintenance worker was electrocuted while doing maintenance repair work on a water tank pump. The CA/FACE investigator was informed of this incident by the California Occupational Safety & Health Administration's (Cal/OSHA) office on September 15, 1993, and went to the site the following morning. An interview was conducted with the employer and a co-worker at the site. Photographs of the incident site were also taken by the CA/FACE investigator. A copy of the Cal/OSHA Report and the Medical Examiner's Autopsy Report were obtained by the CA/FACE investigator.

The victim had worked with his employer for just over 3 years. The organization had been in existence and at this location for 10

years. There were 55 people employed by the organization, but only 7 worked at the incident site. The victim was the only employee with the job title maintenance worker. There was a staff safety officer who devoted approximately 25% of his time to safety issues. The organization did not require that the victim wear any personal protective equipment (PPE) for his job. There were written safety rules which applied to some jobs, but there were no safety guidelines for the job the victim was doing at the time of the incident.

INVESTIGATION

The employer in this incident was a non-profit organization that provided day training for mentally disabled adults. The Director stated that the organization was financially supported by the state, however, he also indicated that to bring in additional revenues they ran several nurseries on the property. He explained that they obtained the water for the plants from a well located on the property. This well was pumped at night into a large water tank. The tank measured 10 feet in diameter and 45 feet in length and had a maximum water capacity of 25,000 gallons. The victim's job title was maintenance worker. His job description involved working on the grounds and helping staff members with any mechanical difficulties they experienced on the job.

On the day of the incident, the victim had been informed by his

supervisor that the water tank had been leaking the night before. According to the supervisor, both he and the victim discussed the situation and agreed that an outside contractor should be contacted to make the necessary repairs. A contractor had visited the site earlier in the week and had installed a new pump on the water tank. After the conversation between the victim and his supervisor, the victim went out to look at the water tank. The supervisor stated that neither he nor anyone else had instructed the victim to make any repairs to the tank. Co-workers and the victim's supervisor did state, however, that the victim had often looked into mechanical problems on his own in the past, in order to avoid the additional expense of an outside contractor. No one witnessed the victim working on or near the water tank. The victim was discovered by a co-worker lying on top of an electrical conduit in a wet grassy area in front of the water tank.

The co-worker (co-worker#1) stated that he called the victim's name but received no response and described the victim's facial coloring as being dark gray. The victim was lying next to a ladder and on top of an electrical conduit. The victim apparently had been trying to repair the water pump when the incident occurred. Judging from the position of the victim's body and the condition of the conduit, he may have grabbed the electrical conduit as he was falling from the ladder or top of the water tank. The distance to the top of the water tank was approximately 15 feet. No one witnessed the victim working on the water tank, but at some point

while the victim was on top of the tank he may have had his hand on the electrical conduit. A piece of material from the metering device was found on the electrical conduit under the victim's body.

When the first co-worker touched the victim he received an electrical shock. He then moved the victim out of the water and off of the electrical conduit and ran back to a nearby building to call 911. A second co-worker was brought to the scene and after determining the victim had no pulse or signs of respiration the two co-workers began cardiopulmonary resuscitation (CPR). They continued with CPR until a third co-worker arrived to assist. Upon the arrival of paramedics, the power was turned off and CPR was continued. The victim was transported to a local hospital where he was later pronounced dead.

CAUSE OF DEATH

The Medical Examiner's Autopsy Report stated the cause of death as electrocution with contact burns to the left hand and face.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should evaluate their current safety program and incorporate specific training procedures emphasizing the importance of and controlling hazards in the workplace. These

procedures should include, but not be limited to, conducting hazard evaluations before initiating work at a job site and implementing appropriate controls.

Discussion: This incident may have been prevented if the victim had more training specifically related to electrical hazards. Employers should stress the danger of such hazards to all employees and employees should be aware that electrical maintenance work should be performed by a licensed electrician only.

Recommendation #2: Employers should provide a lockout/tagout system for all electrical maintenance work.

Discussion: If there had been a lockout/tagout system in effect at the incident site, the victim could have blocked the electrical energy while looking at or trying to make repairs to the water tank pump. Under Title 8 of the California Code of Regulations (CCRs) section 3314 (b) every prime mover or power driven machine equipped with lockable controls or readily adaptable to lockable controls shall be locked out or positively sealed in the "off" position during repair work and setting-up operations. Machines or prime movers not equipped with lockable controls or readily adaptable to lockable controls shall be considered in compliance with this order when positive means are taken, such as de-energizing or disconnecting the equipment from its source of power, or other action which will prevent the prime mover or machine from inadvertent movement. In all cases, accident prevention signs and/or tags shall be placed on the controls of the machines and

prime movers during repair work.