
A General Laborer Dies When He Falls Into a Process Tank of Heated Nickel Acetate.

SUMMARY

A 31 year-old male general laborer died when he fell into a process tank of nickel acetate heated to approximately 180 degrees. The decedent, working as a general laborer, was in his assigned area performing a hose rinse to parts being removed from a process tank. Another employee asked the decedent for help in removing a ten-pound metal part from a rinse tank. The decedent left his assigned work area to assist the other employee and stood on the lips of the rinse and nickel acetate tanks to help remove the part. The decedent fell into the adjacent tank that contained the liquid nickel acetate. As the decedent struggled to remove himself, he fell back into the nickel acetate tank a second time. Other employees rescued the decedent from the tank and immediately started hosing him down with de-ionized water while removing his boots and clothing. The decedent was transported to a local medical facility for treatment and was transported by the paramedics to the nearest burn center, where he died of extensive thermo chemical burns. The CA/FACE investigator determined that, in order to prevent future occurrences, employers should, as part of their Injury and Illness Prevention Program (IIPP):

- **Develop methods to ensure that employees only perform work they are trained for and assigned to do.**
- **Ensure communication of hazards occurs for all workers with actual or potential exposure to a hazard.**
- **Ensure that there are an adequate number of emergency eyewash and showers located throughout critical work areas where hazards require their use.**
- **Develop a rescue procedure for the emergency removal and treatment of employees who have fallen into process tanks and train all appropriate employees in the process.**

INTRODUCTION

On January 20, 2000, a 31-year-old male general laborer died from injuries received when he fell into a process tank of nickel acetate heated to approximately 180 degrees. The CA/FACE investigator learned of this incident on April 4, 2000 through the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) office in the adjacent county where the incident took place. On April 10, 2000, the CA/FACE investigator traveled to the incident site where he interviewed the finance director and the owner of the company. He inspected the worksite, took photographs, and obtained a copy of the company's IIPP.

The employer of the decedent is a metal finishing company that treats aluminum parts from numerous industries. The treatment process is a variation of rinses and dies in different process lines to accomplish the required finish to the product. Various dies must be heated to certain temperatures in order to get the desired results. There are five process lines in this plant. The incident occurred on their "B" line. This company has been in business for 16 years and has an average of 60 employees who work on two shifts. The decedent worked for this company for three months on the second shift. Their written IIPP contains the required elements and explains a process that is to be followed when employees are required to climb on top of an uncovered process tank. Training for employees is performed by the supervisors and is given on an as needed basis. There is no documentation to support proof of training received. According to the finance director, the decedent had only received general training and not specific training for all tasks, and had been instructed to stay in his assigned work area. Safety meetings are held by-weekly and are usually

presented by the shift leaders. There is no documentation of this activity.

INVESTIGATION

The process tanks involved in this incident have a capacity of approximately 840 gallons and are 4X4 feet square and 4 feet deep. They are in-line and butted next to each other. There is an overhead hoist directly above the tanks to assist with the handling of larger parts. The tanks are elevated approximately two feet off the floor, with a catwalk against the working side of the tanks and a guardrail on the outside of the catwalk. Access to the catwalk is by climbing two stairs at the end of the process line. An emergency eyewash and deluge shower is located at the end of and behind process line B.

On the day of the incident, the decedent's responsibility was to perform the final rinse of all the parts being removed from one of the tanks on the process line. This rinse was accomplished with de-ionized water through a hose. The decedent was wearing rubber boots and an apron. His work area was in front of process line B. According to the employer, approximately half way through the work shift, another employee asked the decedent to help him remove a part from one of the rinse tanks adjacent to the heated nickel acetate tank in process line B. The part was submerged in the rinse tank and weighed approximately ten pounds. The usual procedure for removing parts from the tank was for a worker to hook onto a part and lift it from the tank with a long metal rod while standing on the catwalk. If the part was heavy, then the overhead crane was used. If a worker needed help retrieving a part, then another worker would stand alongside on the catwalk and assist.

The decedent climbed over the handrail of the catwalk to gain access to the area where the other employee needed help. The decedent got on top of the process tanks and balanced himself on the lips of the two tanks adjacent to each other as he attempted to remove the ten pound part from the rinse tank. At this point he fell into the heated nickel acetate tank. As the decedent tried to remove himself from the tank, he fell back in a second time. With help from fellow employees who heard the commotion, the decedent was removed from the tank and placed on the catwalk. They immediately started cooling and rinsing down the decedent with de-ionized water from the hose that was readily available in that area. They did not take him to the emergency deluge shower. Another employee ran to the office and called their supervisor who was not on site at the time of the incident. The supervisor arrived on site approximately five minutes after being notified.

Emergency medical services were not notified because the decedent was conscious and the decedent's co-workers weren't aware of the extent of his injuries. The decedent's co-workers removed his boots, which were filled with the heated solution and started removing his clothing. At this point they noted the severity of the decedent's injuries and he was immediately placed in a private vehicle and driven to the nearest medical facility. This medical facility was not equipped to handle the decedent's injuries, so emergency medical services (911) were called. The paramedics then transported the decedent to the nearest burn center, where he died three days later from his injuries.

CAUSE OF DEATH

The cause of death, according to the autopsy report, was extensive thermal chemical burns.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Develop methods to ensure that employees only perform work they are trained for and assigned to do.

Discussion: The decedent had only worked for this company for three months. In that time period, his assignments were limited to those not involving any hazardous chemicals because the required training had not yet been made available. A simple gesture of helping a fellow employee in essence became an unfamiliar work environment for the decedent that led to his demise. Assuring that employees follow safe work practices can be accomplished through documented, progressive programs of training, recognition of safe work practices, and progressive disciplinary measures. If an employer has implemented such programs and an incident still occurs, the employer may decide that aspects of the program need strengthening; e.g. further training or closer supervision.

Recommendation #2: Ensure communication of hazards occurs for all workers with actual or potential exposure to a hazard.

Discussion: At the time of this incident, no one had yet communicated to the decedent the hazards associated with the open process tanks. This lack of knowledge facilitated the incident since the decedent would not have had the opportunity to develop the caution that arises through such information. Although the decedent was not directly working with the process tanks, his proximity to them made it likely that at some point during his work he would be exposed to them; e.g. helping a coworker, performing a rescue, etc. Communication of hazards is most effective when it targets both exposed workers and those with a reasonable potential for exposure.

Recommendation #3: Ensure that there are an adequate number of emergency eyewash and showers located throughout critical work areas where hazards require their use.

Discussion: When emergencies of this nature occur, timing is critical for the survival of the victim. The closest emergency deluge shower to where the incident took place was on the opposite side of the process tanks where the decedent was rescued. His rescuers would have had to guide him to the end of the catwalk, down some stairs, then around the processing tanks to gain access to the emergency shower. It would have taken in excess of the required 10 seconds to reach this deluge shower. Had an emergency deluge shower been located on the same side of the process tanks as the catwalk, the employees performing the rescue would have been more prone to use it over the rinse hose, possibly saving the decedent's life.

Recommendation #4: Develop a rescue procedure for the emergency removal and treatment of employees who have fallen into process tanks and train all appropriate employees in the process.

Discussion: The importance of having a formalized rescue procedure is paramount, as it enables the rescuers to perform this function in the least time possible; educates employees on equipment needed to make a successful rescue; assures proper notifications are made; assures that employees minimize their exposure while performing the rescue, and assures that proper first aid is performed using proper equipment (such as deluge showers) to minimize injuries and possibly avoid a fatality. Had such a procedure been in place at the time of this incident, proper notification and first aid would have been performed, possibly saving the decedent's life.

References:

Accident Prevention Manual for Industrial Operations, National Safety Council, 8th Edition, 1983

California Code of Regulations, Vol. 9, Title I, Sections 3480, 5162, 5167

Emergency Eyewash and Shower Equipment, ANSI Z358.1-1981, Sections 6, 8

FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the California Public Health Institute, and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations on work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

NIOSH funded state-based FACE programs include: Alaska, California, Iowa, Kentucky, Maryland, Massachusetts, Maryland, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Washington, West Virginia, and Wisconsin.

Additional information regarding the CA/FACE program is available from:

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