

A **55 year old male** employee was **sprayed with a chemical** about the face, neck, arms, and torso during the task of transferring a chemical from a vat to a tanker truck.

The employer brings chemicals in, dilutes them down, and cold blends the chemicals in large vat tanks to produce biocides used for fracking to prevent degradation of polymers. The volume of chemicals is specifically blended into specific compositions according to client order. There is no heat, pressure, or vacuum involved in the mixing process. Chemical, B2512, is one of the blended chemicals produced by the employer. After the chemical is produced, the chemical is transferred from the mix tank into a semi-truck to be shipped.

On the day of the accident, an victim began transferring chemical B2512 from the vat tank to semi-truck tank. As the chemical was being pumped into the truck, there was a digital quantity indicator the victim viewed to determine when the entire chemical had been transferred. After the specific amount of chemical had been transferred to the truck, the victim began the shutting down and disconnecting procedures. The victim closed the valves at the reservoir tank and lifted the hose to walk the remaining chemical into the truck. The victim returned to the reservoir tanks to open the bleed valve on the lines coming from the tanks. He then removed the strap from the hose connection and opened the bleed valve to the hose which connected into the truck. The bleed valve was pointed down toward a bucket so any residual chemical expelled was caught and could be discarded. The victim appeared to have closed the valve and walked over to a desk to retrieve a rag. He returned to the truck with the rag and used it to wipe-off chemical that had gotten on the bumper of the semi-truck. Once he wiped-off the truck, he proceeded to unhook the hose from the truck before ensuring the pressure inside the hose had been equalized.

When the victim removed the pressurized hose from the truck, it caused the remaining chemical in the line to spray out at a high velocity. The chemical sprayed the back of the truck and the victim. His face, neck, arms, and torso were saturated with the chemical. He stepped back, removed his safety glasses, wiped his face, and then proceeded to the changing area. There was an emergency eyewash station located about 10 paces from where the truck was being loaded.

The victim walked into the break area, discarded the soiled uniform into a laundry chute, and went to his locker to obtain a clean, dry uniform speaking to the Supply Chain Manager on the way, saying he was doing ok after being sprayed with a

chemical. The victim put on the clean uniform and safety glasses then went back to the truck loading area to finish the process. He inserted the line plug into the hose and placed it near the floor drain. The back of the truck was checked to ensure all valves were closed, and the paperwork for the truck driver was being completed.

Shortly thereafter, the victim began to show symptoms of respiratory irritation and signs of perspiration. He stood in front of a portable pedestal fan in the truck loading bay to cool off then walked back into the locker area and stood in front of a pedestal fan to attempt to cool off. During that time, it was noted that he began to experience an increase in respiratory distress and exhibited labored breathing.

The Supply Chain Manager went over to the lockers and began looking for the victim's asthma kit. The employee suffered from asthma and brought a kit which consisted of a full face mask and a nebulizer. His condition worsened over the next several minutes, and EMS was called after the victim lost consciousness and began to convulse. It was determined that the hazard statements on the SDS detailed that the chemical may cause allergy or asthma symptoms or breathing difficulties if inhaled. The toxicological information detailed coughing and difficulty breathing as one of the characteristics. The only form of PPE used by the victim was safety glasses.

Citation(s) as Originally Issued

A complete inspection was conducted at the accident scene. Some of the items cited may not directly relate to the fatality.

Citation 1 Item 1 Type of Violation: Serious \$4,000

29 CFR 1910.132(a): Protective equipment was not used when necessary whenever hazards capable of causing injury and impairment were encountered:

The employer did not ensure employees used chemical resistant clothing when transferring corrosive chemicals, such as B2512.

Citation 1 Item 2 Type of Violation: Serious \$5,400

29 CFR 1910.133(a)(1): The employer did not ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation:

The employer did not ensure employees wore safety glasses with side shields (or goggles) and a face shield during the transfer of corrosive chemicals, such as B2512.

Citation 1 Item 3 Type of Violation: Serious \$4,000

29 CFR 1910.138(a): The employer did not select and require employee(s) to use appropriate hand protection when employees' hands were exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasion; punctures; chemical burns; thermal burns; and harmful temperature extremes.

The employer had not ensured chemical resistant gloves were used during the transfer of corrosive chemicals, such as B2512.

Citation 1 Item 4 Type of Violation: Serious \$5,400

29 CFR 1910.1200(h)(3)(iii): Employee training did not include the measures employees can take to protect themselves from chemical hazards, including specific procedures the employer had implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures and personal protective equipment to be used:

The employer had not trained employees on effective measures employees could take to protect themselves from exposure to corrosive chemical when disconnecting transfer piping during bulk truck loading processes.

Citation 1 Item 5 Type of Violation: Serious \$5,400

TCA 50-3-105(1): The employer did not furnish employment and a place of employment which were free from recognized hazards that were causing or

likely to cause death or serious physical harm to employees, including severe skin burns, eye damage, asthma symptoms, breathing difficulty, and death, in that, employees conducted a bulk truck loading process without implementing measures to protect employees from accidental release of corrosive chemical.

The methods employees used to disconnect corrosive chemical transfer piping from the bulk truck failed to prevent unintended, pressure-driven chemical release from the line. The Quality Control Procedure for loading bulk chemicals into trucks did not contain methods to confirm residual pressure had been evacuated within the line, prior to disconnect. In the event of sudden, pressure-driven chemical release, employees were exposed to corrosive chemical by contact to the eyes, face, and body, and by inhalation.

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