

Case 391. 30-year-old welder's helper died due to complications of burns sustained in a flash fire that occurred during welding of previously decommissioned piping at a tank farm facility.

A 30-year-old male welder's helper died due to complications resulting from burns sustained in a flash fire that occurred during welding of previously decommissioned piping at a tank farm facility. The decedent was a member of a 4-person crew. The work activity involved cutting the pipe to install a new t-shaped section with flanges to re-route the flow of new material. The crew had installed a plug in an attempt to stop diesel fuel from reaching the work section. Throughout the work, the piping remained connected to a manifold through which ethanol had flowed. To "clean" the pipe prior to reconstruction activities, the crew used a vacuum truck to pull a foam plug (drying pig) through the pipe rather than one designed for purging. No nitrogen was used to propel the drying pig through the piping or the manifold, or to establish an inert atmosphere inside the pipe. This combined failure of incorrect procedures and use of equipment resulted in inadequate purging of the pipe and manifold. The crew used a saw to "cold cut" a 10-inch diameter section of pipe and removed a 2-foot portion. A new flange was put in place and tack-welded on the downstream side of the remaining piping. The crew then tested the atmosphere, inserted a plumber's plug, and struck multiple arcs to tack-weld the new flange on the upstream side of the cut section. It was at that point that the fire/explosion occurred. The decedent was standing a few feet from the pipe opening and was heavily enveloped in the exhausting flames and vapor. He died several days later from burn complications.

MIOSHA General Industry Safety and Health Division issued the following Serious citations to the employer at the conclusion of its investigation.

SERIOUS: WELDING AND CUTTING, GI PART 12.

- RULE 408.11262(1):

Welding or cutting shall not be performed on drums, barrels, tanks, or other containers until they have been cleaned of all flammable combustible or toxic materials or fumes.

(Welding was performed on a de-activated diesel pipeline without the pipeline being adequately cleaned of all flammable or combustible materials at the *incident location*.)
MIFACE removed the name of the incident location.

- RULE 408.11262(2):

All pipe lines or other connections to drums, barrels, or tanks shall be disconnected or blanked.

(No blank or blind was placed between a valve connected to piping containing ethanol and a diesel line prior to the diesel line undergoing a welding operation to attach flanges in the west section of the *incident location*.)

- RULE 408.11262(3):

Hollow spaces or cavities shall be vented and either filled with water or purged with an inert gas before preheating, cutting, or welding.

(Piping was not purged or inerted by employees before performing welding on a pipe in the west section of the *incident location*.)