

Case 342. 31-year-old railroad remote control operator for a steel company died when molten iron which had spilled from a ladle contacted snow causing an explosion and fire.

A 31-year-old male railroad remote control operator for a steel company died when molten iron which had spilled from a ladle contacted snow causing an explosion and fire. The work process leading to the incident was as follows: an overhead crane operator places a ladle of hot metal into a “ladle tilter”. The ladle tilter tilts the ladle to a desired angle for removing the molten slag from the surface of the hot metal. The overhead crane then retrieves the ladle for transport. Incident summary: The area where the ladle was placed into the tilt station was poorly lit. A modified ladle contained approximately 195 tons of molten iron and had been placed on the west tilter unit by the crane operator. The ladle modifications made it difficult to disengage the hooks from the trunnion on the ladle and the operating position for the crane operator made it difficult to observe the west side of the ladle. As the crane operator disengaged the hooks and was trolleying away from the ladle, the ladle tipped and fell to the North off the tilter table spilling molten iron onto the ground. The molten iron breached the building’s outer metal wall located 60 feet away and three or four explosions occurred due to the molten metal coming into contact with water from melting snow. The decedent, who was the remote car operator, had brought the bottle cars with the molten iron to the area where they were being offloaded and was either in the warming shanty or walking to the shanty when the explosions occurred. He was found lying face down in the roadway approximately 10 feet from where the shanty had been located. Emergency response was called and he was transported to a local hospital where he was declared dead. Subsequent investigation found that the tilter had only one of two of the required hydraulic cylinders (the east side hydraulic cylinder had fallen off of the unit) and that the stop blocks which prevented the tilt frame from rearward motion had been removed sometime in the past (date unknown). Anchor bolts had also failed, most likely due to faulty welds.

MIOSHA General Industry Safety and Health Division issued one alleged Serious citation to the employer at the conclusion of its investigation.

SERIOUS: MICHIGAN OCCUPATIONAL SAFETY AND HEALTH ACT, ACT 154, P.A. 1974, AS AMENDED, SECTION 11(a):

The employer did not furnish to each employee, employment and a place of employment, which was free from recognized hazards that were causing or were likely to cause death or serious physical harm to the employee:

Employer did not maintain the West Station:

- a. East side cylinder bracket identified in a consultant engineering report* dated October 4, 2013, was not repaired and failed on November 30, 2013.

- b. East side cylinder was removed and the use of the station for the desulfurization process without consulting an engineer to determine the station could be used with one of the cylinders removed.
- c. Both stop blocks were missing.
- d. Employees complained about getting hung up on ladle #5 (which was involved in the incident) after the ladle had been repaired, and nothing was done by the company to address the issue.
- e. Consultant engineering report dated October 4, 2013 reported the east side pivot point was severely worn and the issue was not addressed.
- f. Numerous other structural findings from a consultant engineering report dated October 4, 2013 were not repaired.
- g. The concrete on the west side of the ladle tilter, the concrete is severely spalled which is identified in the consultant engineering report dated October 4, 2013.

Among others, one feasible and acceptable method to correct this violation is to initiate a program to ensure that the Station is maintained per approved engineered specifications and structural findings addressed in inspection reports are repaired properly.

*NOTE: MIFACE removed the name of the engineering firm to preserve anonymity.