H89 A Fatality Caused by Molten Metal Splash During A Field Visit Near A Furnace: A Case Report

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After attending this presentation, attendees will understand the current case of a fatality caused by a molten metal splash during a field visit that occurred near a furnace of a smelter factory.

This presentation will impact the forensic science community by creating an awareness of the possibility that people working on or visiting furnaces containing molten metal should be aware of the possibility that exploding, splashing molten metal could cause a fatality or serious injuries to the operator or bystanders. This presentation highlights the fact that such molten metal explosions do occur and can cause fatal injuries.

Molten metal splash is the most common cause of melt deck injuries and is caused by the addition of wet materials to the molten bath. Wet charge materials are a serious safety hazard in all foundries. Water, moisture, or any liquid-bearing material instantaneously turns to steam when coming into contact with molten metal — expanding to 1,600 times its original volume and producing a violent explosion. This occurs without warning and throws molten metal and possibly high-temperature solids out of the furnace, putting workers, the furnace itself, and nearby plant equipment at risk.

A water/molten metal explosion can occur in any type of furnace; however, for an induction furnace, the aftereffects may be more serious, including the possibility of additional explosions caused by liquid in a ruptured cooling system coming into contact with molten metal in the bath. Molten metal need not be present in the furnace for a water/molten metal explosion to occur. Explosions can also occur if sealed drums or containers containing water are charged into an empty but hot furnace. In this case, the force of the explosion will eject the newly charged material and quite likely damage the refractory lining as well.

This presentation highlights a case in which the victim, while on a field visit to a factory, was fatally injured by molten metal splash. This presentation will also discuss the importance of having knowledge of such injuries when dealing with these medicolegal cases.

Molten Metal, Splash, Explosion