

4. Fire/Explosion

Two employees, a 42-year-old and a 32-year-old, received third degree burns over most of their bodies after an explosion in their workplace. Both employees subsequently died from their injuries. The company manufactures iron powder from scrap metal through a multi-step process involving molten metal, high-pressure cold water, high-temperature furnaces, annealing, mixing with carbon, and other procedures. Once the process is complete, the final product is transported through a series of bucket-elevator and screw conveyors to the storage area and placed into shipping containers. Two maintenance personnel went to the top of a bucket-elevator conveyor to determine why it had shut down. One of the maintenance employees radioed the elevator operator to try and restart the machine. When the operator did so, the surrounding suspended iron dust ignited and created a flash fire, burning both maintenance workers. Large accumulations, up to 4 inches in some locations, of combustible iron dust was found on the machine itself, as well as on the surrounding rafters, trusses, walking surfaces and guardrails.

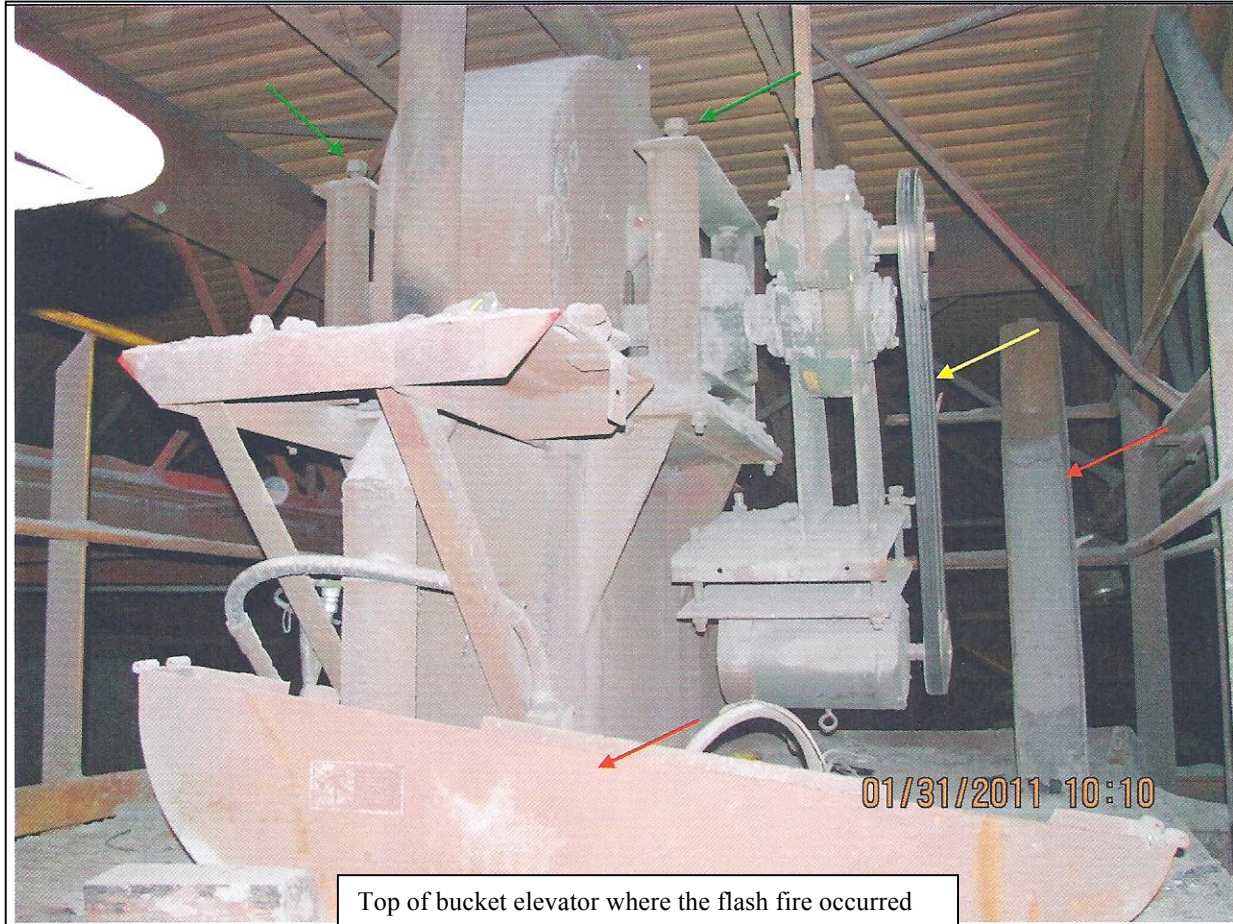
TOSHA Citation(s) as Originally Issued

Citation 1

Item 1 1910.22(a)(1)	All places of employment, passageways, storerooms, and service rooms were not kept clean and orderly and in a sanitary condition.
Item 2 1910.22(c)	Covers and/or guardrails were not provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc
Item 3 1910.37(b)(6)	Each exit sign was not illuminated to a surface value of at least five foot candles (54 lux) by a reliable light source.
Item 4 1910.147(c)(4)(i)	Procedures were not developed, documented and utilized for the control of potentially hazardous energy.
Item 5 1910.147(c)(4)(ii)	The procedures did not clearly and specifically outline the scope, purpose, authorization, rules and techniques to be utilized for the control of hazardous energy.
Item 6 1910.304(g)(5)	The path to ground from circuits, equipment and enclosures was not permanent, continuous and effective.
Item 7 1910.305(a)(1)(i)	Metal raceways, cable trays, cable armor, cable sheath, enclosures, frames, fittings and other metal noncurrent-carrying parts that were to serve as grounding conductors, with or without the use of supplementary equipment grounding conductors, were not effectively bonded where necessary to ensure electrical continuity and the capacity to conduct safely any fault current likely to be imposed on them.
Item 8 1910.305(b)(1)(i)	Conductors entering cutout boxes, cabinets or fittings were not protected from abrasion and openings through which conductors enter were not effectively closed.
Item 9 1910.305(b)(2)(i)	All pull boxes, junction boxes and fittings were not provided with covers identified for the purpose.
Item 10 1910.1200(h)(2)(iii)	Employees were not informed of the location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals and material safety data sheets.

Item 11 1910.1200(h)(3)(ii)

Employee training did not include at least the physical and health hazards of the chemicals in the work area.



Top of bucket elevator where the flash fire occurred