Two Die When Fumes Ignite in Elevator Car



A company had contracted with a building maintenance company to refinish two office elevators. The elevators' interiors were lined with brass sheet metal with a lacquer protective coating. The interiors of elevators like these are routinely refinished to remove scratches and bring back the original luster of the finish.

The basic procedure for refinishing these metal surfaces was to remove the lacquer finish using cotton rags soaked with a solvent-based material and wipe down the walls. Once all the lacquer finish is removed, the metal surfaces can be polished with electric drill-mounted buffing pads.

The two victims and one co-worker entered the elevator carrying a ladder, cotton rags, an open five-gallon bucket used to contain spent cotton rags, and an open two-gallon bucket of a lacquer solvent called #70 Cleaning Thinner.

When the workers were ready to begin stripping the lacquer finish with the cleaning thinner, the elevator door was closed with the three men inside. The foreman present went to the second floor, opened the doors to the elevator shaft and tripped a device on the top of the car with the men inside that would lock the doors shut and keep the elevator out of service. The electrical power to this elevator was never shut off so the workers used the existing lighting in the elevator.

According to the employer, the workers were not following company standard operating procedures by working with the #70 Cleaner Thinner in open buckets and as written in the SDS for solvent, the "fumes are heavier than air". So, the fumes of the product were accumulating in the bottom of the elevator car.

One of the worker's rags was ignited by either a spark from the light fixture panel or the worker's rag brushed against one of the recessed lights in the roof of the elevator, shattering the bulb and igniting the rag. The worker dropped the rag on the floor to try and extinguish the flame but the accumulated fumes of the cleaner ignited and the entire cab became filled with flames. Trapping the workers inside the elevator.

The foreman, realizing the elevator was on fire, ran to the second floor and

tripped the device that kept the cab doors locked. He then retrieved a chemical fire extinguisher and returned to the flame-engulfed elevator on the first floor and pried open the doors.

The co-worker immediately ran out and was followed by Victim #2. The foreman tried to extinguish the flames, but the fire was too intense. He then rolled Victim #2 in a rug to extinguish his burning clothes and body, and then dragged him outside the building. The foreman then tried to return inside the building to rescue Victim #1, but the flames and smoke were too intense. Victim #1 became entangled with the ladder and was not able to escape the burning elevator cab.

At some point during this incident 911 was called and the local fire department and an ambulance were dispatched. Victim #2 and the co-worker were transported to a local hospital. Victim #1, a 21-year-old male, was pronounced dead at the scene. Victim #2, a 30-year-old male, survived 39 days before succumbing to his injuries (he suffered second-and-third degree burns to 70% of his body). The co-worker suffered first-and-second degree burns and survived.

There are standard precautions outlined by the American Society of Mechanical Engineers for cleaning, polishing, and refinishing elevator cars. These include the following – most of which were not followed:

Before refinishing work is started, the following precautionary measures should be taken.

1. All electric supply and control lines to the car for lighting, fan, alarm bell, motor-generator set, operating switches or buttons, etc. should be disconnected. The only lighting permitted in the car during refinishing work shall be a portable lamp with a vapor-proof globe, without switch, connected to a convenience receptacle located outside the hoistway. The light shall be provided with a guard to prevent breakage.
2. The vent at the top of the hoistway should be fully opened.
3. The top emergency exit in the car should be fully opened.
4. The hoistway door at the floor where the work is being done should be kept fully opened during the entire time of refinishing.
5. The car door should be kept opened except when it is being refinished.

In addition to these precautions, had a hazard and risk assessment been conducted it is likely many of these hazards would have been identified and controls put in place.

https://www.cdc.gov/niosh/face/stateface/mo/92mo046.html