

Hot Work Is More Than Welding, Burning, and Grinding

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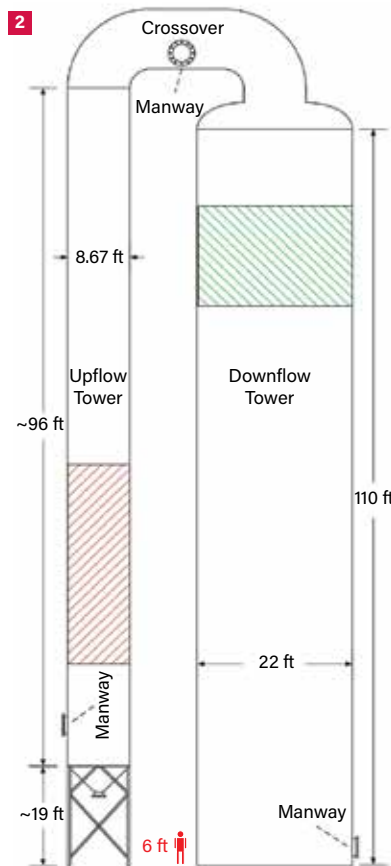


▲ A fire occurred during hot work at a paper mill. Read U.S. Chemical Safety and Hazard Investigation Report No. 2020-07-I-NC-3 for more information.

On Sept. 21, 2020, a fire was ignited in a bucket of flammable resin being used to re-line a fiber-reinforced plastic (FRP) tower at a paper mill (Figure 1). Smoke and fumes from the fire killed two contractors. The incident had many contributing factors and lessons learned, but this Beacon focuses on the uncontrolled hot work.

The paper mill was shut down for a turnaround, which included internal repairs to the upflow and downflow bleaching columns (Figure 2). The column repairs were managed under two confined space entry (CSE) permits. Hot work was not planned nor authorized for either job. Initially, no flammable materials were present inside the towers, but the FRP walls in the upflow tower were combustible.

On the day of the fire, the crew working in the upflow tower could not cure their resin properly due to cool temperatures. When the crew could not locate drum heaters, they decided to use a heat gun (Figure 3) to warm the bucket in their working area (Figure 2, red). The crew accidentally dropped the heat gun into the resin bucket, igniting the flammable contents. The crew did not have a fire extinguisher, and the fire spread, eventually igniting the FRP walls. Two contractors working in the connected downflow tower (Figure 2, green) were overcome by the gases before they could escape.



Did You Know?

- Welding, flame-cutting, and grinding are well-known hot work hazards because they can be spark-scattering activities that send sparks a long distance.
- Many other tools (e.g., electrical tools, hand tools) also produce more localized ignition hazards either from heat or sparks from the motor brushes. As battery-powered tools become more powerful and more common, they represent an increasing ignition hazard.
- Electronic devices need to be certified for use in classified areas (e.g., cameras, test equipment, tablets).
- Contractors can introduce other hazards with their tools or construction materials.
- Even if a fire does not injure or kill people, it can still incur significant damage and business interruption costs.
- Confined space work is one of the most hazardous activities in the chemical process industries (CPI). Many people have been hurt or killed during these activities.
- All of these hazards can be managed using well-planned hot work and safe work reviews before issuing permits.

What Can You Do?

- If you issue or oversee work permit systems, make sure you understand the work that contractors will be performing and their methods, materials, and tools.
- The permit issuer is responsible for protecting contractors from process hazards. The issuer must also recognize any hazards that contractors bring with them and protect company facilities from those hazards.
- Emphasize to the workers that if anything in the original plan changes, they must check back with the issuer to see if the permit and precautions need to be updated.

Even if not spark-scattering, the use of electrical tools is hot work!