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Hot Work is more than Welding, Burning & Grinding

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Fig. 1: Heat Gun *Ignition source*

Fig. 2: After the fire

On September 21, 2020, a fire (Fig. 2) was ignited in a bucket of flammable resin being used to reline a Fiberglass Reinforced Plastic (FRP) tower at a papermill. Smoke and fumes from the fire killed two contractors. There are many lessons to be learned from this event. This Beacon will focus on the uncontrolled Hot Work aspect of the incident.

The plant was shut down for a turnaround, including internal repairs to the Upflow and Downflow bleaching columns (Fig. 3).

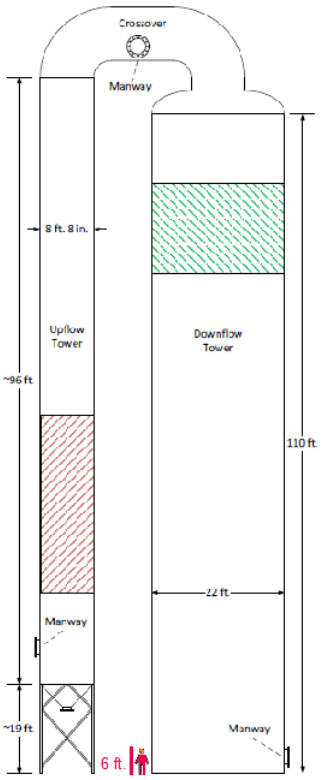

Fig. 3: Columns *size comparison added*

The repairs to these were managed under two Confined Space Entry (CSE) Permits. Hot Work was not planned, nor authorized for either job. There were no flammable materials in the towers, though the FRP walls in the Upflow Tower were combustible.

On the day of the fire, the crew working in the Upflow Tower (*left*) were having difficulty getting their resin to cure properly, due to cool temperatures. When they found no drum heaters for the drum outside the tower, they decided to use a heat gun (Fig. 1) for the bucket at their working place (*marked red*).

The heat gun was accidentally dropped into a resin bucket, igniting the flammable contents. The crew didn't have a fire extinguisher, and the fire spread – eventually igniting the FRP walls. Two contractors working in the connected Downflow Tower (*right; marked green*) were overcome by the gases before they could escape.

Reference & Figures
https://www.csb.gov/assets/1/20/evergreen_investigation_report_final.pdf?16709

Did You Know?

- Welding, flame-cutting and grinding are well-known Hot Work hazards, because they can be "spark-scattering" activities sending sparks a long way.
- Many other tools - like electrical tools or even some hand tools - also produce more localized ignition hazards either from heat or from sparks from the motor brushes. As battery-powered tools become more powerful and more common, they represent an increasing ignition hazard.
- Electronic devices being used (e.g. cameras, test equipment, tablets) need to be certified for use in classified areas.
- All these hazards can be managed using well-planned Hot Work and safe work reviews before issuing permits.
- Sometimes, contractors bring other hazards with their tools or construction materials.
- Even a fire that does not injure or kill people can cost a company a lot of money due to the damage and business interruption.
- Confined Space Work is one of the highest hazard activities in our industry. Many people have been hurt or killed during those activities.

What Can You Do?

- If you issue or oversee work permit systems, make sure you understand the work contractors will be doing, and the methods, materials and tools they will be using.
- The permit issuer is responsible to protect contractors from the hazards of the processes. But 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 the precautions need to be updated.

Even if not spark-scattering, the use of electrical tools is Hot Work!