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Tower Top Rockets Off



This accident investigated by and picture provided by the U.S. Chemical Safety and Hazard Investigation Board. Visit their site at <http://www.csb.gov>

Here's What Happened

Five weeks before the explosion, this tower was taken out of service. Approximately 1,200 gallons (4,500 liters) of the hydrocarbons being processed remained in the tower. During those five weeks, steam was sporadically and inadvertently added to the tower. The steam slowly heated the residual material, but since the tower was not operating, the temperature rise was unnoticed by operations.

On the morning of the accident, operations heard a rumbling coming from the tower and then a loud sound similar to a relief valve venting. They sought shelter in a nearby control room. Within minutes, the 145 foot (44 meter) tall tower exploded, injuring three workers.

The explosion blew the top 35 feet (11 meters) of the tower off and hurled debris a mile (1.6 kilometers). Vessels as far as 500 feet (150 meters) away were damaged and several fires started. A portion of the top section of the tower was never found.

How Did This Happen?

When operations decided to shut the steam off, they closed the steam supply valves, but those valves were corroded and a small amount of steam leaked through. Over the next 5 weeks, the 1,200 gallons of hydrocarbons that remained in the tower began to decompose into unstable chemicals because of the inadvertent long term heating.

A PHA of a similar but batch production process was conducted several years earlier and revealed that the chemicals used would decompose above 370°F (188°C). This information was never shared with those operating the continuous process. Therefore, no temperature interlocks were installed and there was no mention of high temperature decomposition reactions in the operating instructions.

PSID Members see: Free Search—Distillation column

What You Can Do

- Know the “shut down” and “make-safe” procedures for your unit. Practice them in your mind.
- Many accidents happen each year because of valves that leak through. Whenever a process is shutdown, verify that manual valves are providing tight shutoff. Take corrective actions if they are not.
- Recognize that all buildings are not safe havens. In some cases the building may collapse if an explosion is nearby. Know which buildings are safe and which are not.
- Pay attention and react to unusual sounds and pressure/temperature readings, even if the unit is down. They may be indicating a major problem.

ACT before the REACTION is Uncontrollable !

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