

## Flammable Material Release Inside Building Causes Explosion

**I**n June 2009, there was a major explosion at a meat processing plant in Garner, NC. A new natural gas line had been installed to supply fuel to a water heater. The new pipe was being purged with natural gas to remove air. The natural gas from the purge was released into a building intermittently over a 2½ h period. An explosive mixture formed and ignited. The explosion destroyed the building, killed 4 workers, injured 67 people, and caused a release of 18,000 lb of ammonia.

Most people would recognize natural gas as a fuel that could cause an explosion. But remember that the release of any flammable gas or volatile flammable liquid from piping or equipment has the potential to cause a similar incident.

Many manufacturing processes use flammable gases or liquids, and most factories, offices, and laboratories use natural gas, propane, or other flammable fuels. In preparation for maintenance, start-up, or other work, it may be necessary to purge the flammable process material or fuel from the pipes or equipment. This incident reminds us of the importance of purging that flammable material to a safe place where it can be safely contained, treated, or dispersed. Never allow flammable materials to accumulate in a building, room, or any other confined space.



### Did You Know?

- A small amount of flammable gas or vapor can create an explosive vapor cloud in a building or room. For example, it only takes about 11 lb (5 kg) of propane to create a flammable mixture in a room 20 ft long, 20 ft wide, and 11 ft high (6 m × 6 m × 3.5 m). The 11 lb (5kg) of propane packs as much energy as 110 lb (50 kg) of TNT!
- Any closed space, such as a building or room, can allow a released flammable material to accumulate to an explosive concentration.

### What Can You Do?

- Understand the fire and explosion hazards of the materials in your plant. Don't forget about natural gas, propane, and other fuels!
- When purging equipment and piping (for example, when preparing equipment for maintenance), make sure flammable materials are vented to a safe location away from personnel and ignition sources. Follow your plant's procedures for safely purging flammable materials.
- Whenever possible, purge flammable vapors and gases to collection systems that go to flares, scrubbers, or other treatment systems. Avoid purging indoors, and conduct a thorough hazard analysis to identify job-specific precautions to protect personnel if this is unavoidable.
- Use flammable gas detectors to monitor areas where flammable materials may be vented or purged.

***It doesn't take much released flammable vapor in a room to cause a big explosion!***

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