

A Plugged Line or Equipment Is More than Just a Nuisance

Approximately 1 hr after process startup at a facility that produced plastics, an extruder downstream of the reactor was malfunctioning. The process was aborted and an unusually large amount of partially reacted waste was diverted to a polymer catch tank. Inside the tank, hot molten plastic continued to react, and slowly began to decompose, generating gases and causing the contents to foam.



▲ **Figure 1.** In this particular incident, the vent line was obscured by layers of polymer.



▲ **Figure 2.** Built-up pressure inside the tank caused the polymer catch tank cover to blow off.

The foam filled the tank and plugged the vent line and relief devices on the surge tank, solidifying as it cooled

(Figure 1). As the off-spec product released gases, pressure in the tank increased, but the pressure gauge on the tank was also plugged and did not register the pressure increase.

When maintenance personnel came to clean out the surge tank, the residual pressure blew the heavy, partially unbolted tank cover off as they tried to open it (Figure 2). Hot plastic was expelled and the force of the release caused nearby tubing to break. Hot fluid from the tubing ignited, resulting in a fire. All three personnel were killed in the incident.

Did You Know?

- Plugged lines and equipment are a nuisance; clearing them safely can be messy. However, they can indicate other system issues, such as a process upset or excess corrosion. A plugged line may also suggest that key instrumentation or relief devices are also blocked.
- Various factors can cause plugging, such as higher-melting-point material or solids in the process stream, or the presence of corrosion products.
- A detailed protocol lists procedures and methods required to clear plugged lines or equipment. It is important to create such a protocol if one does not already exist.
- It is important to follow lockout/tagout procedures when unplugging equipment. Before opening a line or piece of equipment, check that it is properly isolated.

What Can You Do?

- Report plugging even if a minor process problem occurs.
- Frequently investigate plugged lines or equipment to avoid upsets and problems when clearing them.
- Before clearing lines or equipment, stop to review the procedure and any hazards that may be present or exposed during maintenance.

When equipment plugs, other equipment may be plugged too!

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