

## Some Short-Cuts May Cut Lives Short

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▲ **Figure 1.** In 1989, a fire at a plastics plant in Pasadena, TX, began after operators bypassed proper maintenance procedures. The ensuing fires took 10 hours to be brought under control (1).

Thirty-five years ago, 85,000 lbs (39 m.t.) of process gas, mostly ethylene, was released from a plastics plant in Pasadena, TX. The cloud ignited two minutes later in an explosion. Debris flew as far as 6 mi (10 km), luckily hitting no one. The ensuing fire caused the explosion of a 20,000-gal (75 m<sup>3</sup>) isobutane tank; other explosions followed. On the site, 23 employees and contractors were killed, and another 314 workers were injured. Extensive damage to the site and business interruption caused financial losses of about \$1.5 billion.

Workers were clearing a settling leg that was used to collect polymer in a polyethylene loop reactor. Company and industry safety standards required isolation by means of a double-block system or the use of a blind flange. However, the plant used a simpler procedure with a single isolation point. In addition, the company failed to enforce an effective permit-to-work system for employees and contractors.

The accident investigation established that the single ball valve isolating the settling leg from the process was opened at the time of the release. The air hoses to the valve had been connected, which was against procedures, and cross-connected so that the air used for closing the valve opened it instead. The investigation concluded that process gas was intended to push down some polymer that blocked the pipe, but that could not be confirmed.

The Occupational Safety and Health Administration (OSHA) reported many deficiencies, but this Beacon discusses safe work procedures.

1. Sibilski, P., "Looking Back: PHILLIPS 66 Explosion, Pasadena, TX," North Jersey Section AIChE Virtual Meeting (May 27, 2020).

### Did You Know?

- Human error is always a possible source of system malfunction, but applying both engineering and administrative controls can prevent serious incidents.
- Many standards and regulations originate from previous incidents. The intent of these standards is to protect workers from risks they cannot afford to learn through experience.
- Many incidents happen when safeguards (engineering or administrative) fail or are deliberately bypassed.
- A non-standard method may have been used once by exception only. As human nature prefers easier ways of doing things, the exception becomes routine. This normalization of deviance is a dangerous behavior and not a safe thing to do!
- The right way to open energized equipment is to use isolation and lockout/tagout methods according to standard procedures.

### What Can You Do?

- Understand the major hazards at your plant. Know the critical safeguards against those hazards and be sure those safeguards are working properly.
- Do not bypass safeguards without an assessment, special procedure, and additional safeguards that were approved by a management of change (MOC) process. The temporary removal or bypassing of safeguards should never be considered normal procedure.
- If you think a process or procedure could be made simpler, submit your idea to your supervisors. It may be an improvement, but it must be assessed to be workable and safe by getting properly reviewed and authorized.
- If you see someone taking shortcuts, point out the right procedure — it is to everyone's benefit to do things safely.
- Everyone must have the operational discipline to carry out each task the right way every time.

**Do things right the first time; there may be no next time.**