

Manage Temporary Changes

A filter on the suction of a pump frequently plugged. Because of this, the pressure needed to be monitored, both in the field and at the control panel. To minimize installation time for a pressure transmitter, it was decided to install a tap on the existing connection for the local pressure gage and connect a pressure transmitter to this tap. Because of the rush and the temporary nature of the change, it was decided to use tubing for the change. The installation, though accepted as a temporary installation, did not follow appropriate design codes or engineering standards, and no management of change (MOC) review was done.

Approximately three years later, the tubing ruptured and combustible material at a temperature of 360°C leaked to the atmosphere. The leaking material ignited and started a major fire, which destroyed the plant.



Why Did It Happen?

- The temporary installation did not follow appropriate engineering design standards.
- The piping and the temporary installation were subject to vibration caused by the pump.
- The pressure gage installed at the end of the tubing acted as a pendulum. Tubing does not have adequate mechanical strength to withstand vibration and to support instrumentation, such as the pressure transmitter.
- After the cause of the plugging filters on the suction pipe of the pump was eliminated, the temporary installation and the pressure transmitter were not needed, but were never removed.
- As a “temporary” installation, the pressure gage may not have received attention, inspection, and maintenance, particularly after it was no longer needed. It may have just been forgotten.

What Can You Do?

- Follow your plant’s MOC procedure for all modifications of piping, equipment, and procedures.
- Remember that temporary modifications require the same thorough analysis as permanent changes.
- Never make changes to piping or equipment without review by qualified experts to assure that the change follows engineering standards and good practice.
- Follow recommendations from the manufacturer of your equipment.
- If “temporary” modifications are made to a plant, they should have an “expiration date,” and be removed before that date. You should do another MOC review for removal of the temporary installation. Do not let a temporary change become permanent without review.
- If you see equipment in your plant that is no longer used or needed, suggest that it be removed.

This incident has several things in common with the June 1974 explosion in Flixborough, England (June 2004 *Process Safety Beacon*). The Flixborough explosion killed 28 workers, injured 36, and had a major impact on process safety management systems and regulations throughout the world. The pipe that failed at Flixborough was much larger, but some common characteristics of this incident and the Flixborough explosion include:

- An MOC review was not done for a temporary piping modification.
- The temporary piping did not follow appropriate engineering standards, and the piping was not properly supported.
- Stress on temporary piping was one factor in the failure.



The 1974 Flixborough Explosion

Use your management of change process for “temporary” changes!

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