

Safety device or control device?

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In a television news story, a volunteer at a tourist railroad described how he prepared the vintage steam locomotive for its weekend operation. He described how he built up the fire to warm the firebox and increase the boiler pressure. He knew that the locomotive was ready for operation with proper steam boiler pressure when the safety relief valve on the boiler opened!



This sounds a lot like a process industry incident that process safety pioneer Trevor Kletz often described in his talks. Material was pumped to a tank in a manual operation for many years without incident. Then, one day there was a small overflow which the operator quickly stopped. A recommendation of the incident investigation was to add a high level alarm which would shut off the feed to the tank if the operator failed to stop flow, and this was done.

About two years later there was another overflow! What happened? Supervisors decided that the operator could be given other work to do while the tank was filling since there was a high level shutdown. No management of change review was done. A device that was intended to be a second layer of protection became the primary control. When the high level instrument failed, there was nobody in the area and the spill was actually larger.

Did you know?

- The intended operation of the steam locomotive was for the operator to observe the steam pressure and control it when it reached the desired operating pressure. The safety relief valve was intended to be a second layer of protection if the operator failed to properly control the steam pressure.
- The intended operation of the modified tank filling operation was for the operator to manually shut off the feed when the tank filled, as had been done for many years. The high level alarm and feed shutoff was intended to be a second layer of protection if the operator failed to stop flow into the tank.

What can you do?

- **Never use safety devices for control of your process!**
- Know what devices in your plant are intended for process control, and which are safety devices which are intended to be additional layers of protection (see March 2002 *Beacon*) to prevent incidents.
- Make sure your operating procedures and training identify which devices are intended for routine control and which are safety devices.
- Check that all of your plant safety devices are properly calibrated, tested at the frequency specified by the designers, and that the test results are reviewed to identify and correct any reliability issues.

Safety devices – for emergency use only!