

## An Error Trap Leads to a Catastrophe

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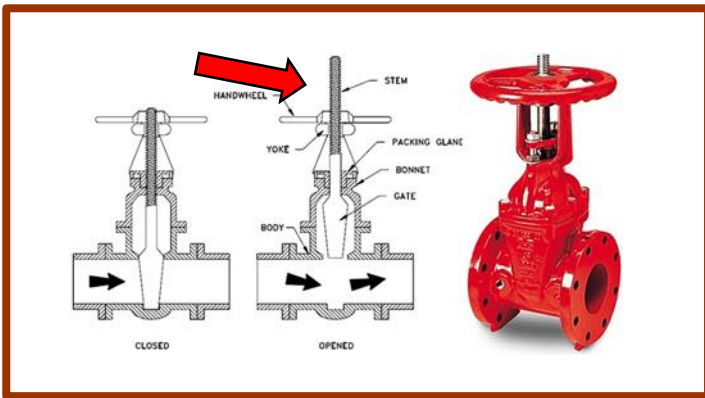


Figure 1: Rising Stem valves

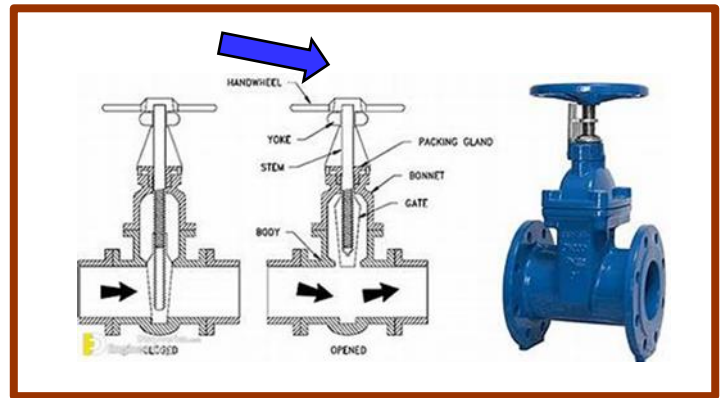


Figure 2: Fixed Stem valves

A fuel terminal was off-loading a large amount of gasoline from a ship to several storage tanks. The supervisor incorrectly estimated the time to fill one tank, and it overflowed into the containment (dike) area.

Unfortunately, the valve to drain rainwater from the containment had been left open and the gasoline flowed out to the retention pond near the wastewater treatment (WWT) area. The pumps in the WWT area were not classified for flammable vapor. The vapors ignited, and the fire spread back toward the overflowing tank. A number of explosions and a facility-wide fire had catastrophic impacts on the plant, community and sensitive environmental areas around the terminal.

### How did this happen?

The tank farm used both rising stem (Fig. 1) and fixed stem valves (Fig. 2.) on the dike drains leading to the storm water retention pond in the WWT area. Rising stem valves allowed operators to easily see the valve position by observing the stem above the valve wheel (red arrow). Fixed stem valves do not provide a visual indication of the position (blue arrow): The stem does not rise above the handwheel when the gate is raised. It was difficult for operators to know the actual position of the fixed stem valve on the dike drain for the tank dike without physically turning it.

Poor lighting in the area made it difficult for operators to see the valve positions. For more details, see CSB Report NO. 2010.02.I.PR

### Did You Know?

- There are two styles of gate valves that look similar. (Figures 1 and 2) .
- Having two different style valves in the same service can create an 'error trap', a situation where a mistake is more likely.
- Operating procedures provide instruction on the safe operation of a process. Where valve positions can be confusing, pictures help explain the right valve position.
- Poor lighting in remote areas can make minor differences in equipment difficult to see and was a factor in this event.

### What Can You Do?

- If you notice equipment that looks similar but operates differently, tell your supervisor. There may be several ways to remove the error trap:
  - Add pictures to improve operating procedures by showing the correct position or alignment for the valves or other equipment.
  - Replace some valves so they all operate the same way and make such changes using Management of Change (MOC).
- Where poor lighting makes operations more difficult, recommend improving the lighting in the area to reduce errors and improve general safety. (Again, follow MOC)
- Some companies consider error traps near-misses and want them reported using a near-miss or other reporting form.
- Also see the June 2006 Beacon for another valve error incident.

**Do not get caught in an error trap !**