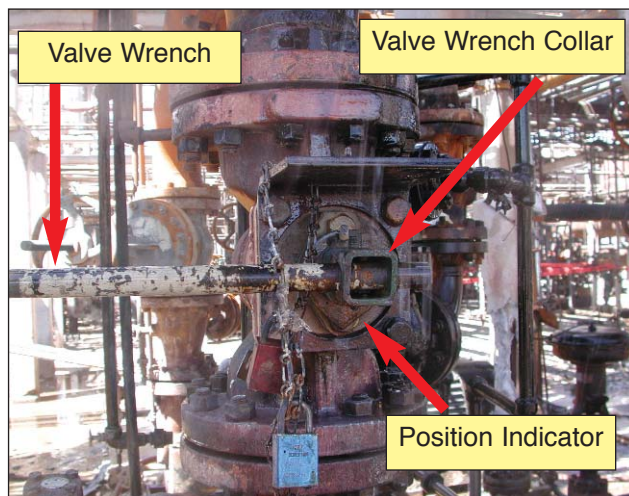


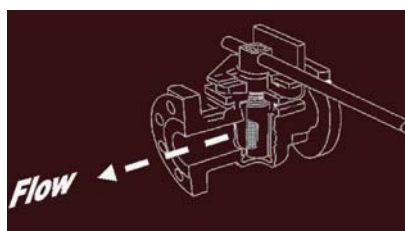
June 2006

## Is this Valve Open?...or Closed?



Many people would expect this valve to be closed — the position of the valve handle (in this case, a “valve wrench”) is perpendicular to the pipe. But close inspection of the valve position indicator shows it is parallel to the pipe, clearly indicating the valve is open! *WHY?* The valve wrench collar is square and can be positioned in two ways — one with the valve wrench parallel to the valve position indicator and the other with the valve wrench perpendicular to the position indicator.

This confusing setup was one cause of an incident that injured 6 people, resulted in \$13 million in damage, shut down a refinery for several months and required off site evacuations. Operations personnel used this valve to isolate a pump for maintenance and mistakenly



⇐ **Actual position and flow.**

**The valve** ⇒ **wrench collar.**



believed the valve was closed. *It was not!* The result: release of a large quantity of flammable liquid at 150 psig (10 bar g) and 350°F (175°C), followed by an explosion and fire.

### Did You Know?

- People have expectations for how equipment will work based on what they see. It is critical that equipment align with these expectations to avoid setting traps for operators and mechanics.
- We may remember that a device works in an unusual manner when we have time to think about it. But, in an emergency or when we are distracted by other events, we forget. Then, we revert to our basic assumption that things work the way we expect them to. In this incident, a valve handle was perpendicular to a pipe, and people assumed it was closed.

### What You Can Do

- Look for equipment that does not work the way you would expect. Have it modified! Pay special attention to confusing control displays, valve position indicators, equipment running status indicators and instrument displays.
- Local culture and/or practices can change the way things are “expected” to appear. For example, some translations of this Beacon will read from right to left. If you use equipment manufactured in another country, it may not operate the way you expect it to — it is also deserving of special attention.
- Take a few minutes to read the U.S. Chemical Safety and Hazard Investigation Board case study on this incident. It will provide additional information as well as other causes for this incident.

<http://www.csb.gov>

**Equipment should operate the way you expect!**

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