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Why is ANSI/FCI 70-2, Standard for Control Valve Seat Leakage Testing important?

Control valves are not isolation valves, they will leak. The extent to which control valves leak can vary quite a bit from one valve to another, particularly when different seal types are involved. This is why ANSI/FCI 70-2 is important - it defines benchmark standards for seat tightness of control valves in the form of maximum allowable leakage under defined test conditions. During the valve specification process, these benchmarks allow the user to ensure the rated leakage of the valve is suitable for a particular application.

A valve's ability to positively shut-off could be a necessary requirement in many systems and facilities. The standard holds the valve manufacturer to a specific and defined test procedure, allowing for accurate comparisons to be made across a large range of potential valve offerings. In order to achieve a class rating and be able to publish the valve's conformance, the manufacturer must prove the valve's design and assembly. This provides the user with confidence in both the valve itself as well as the manufacturer.

Additionally, once the valve is in service, the leakage class ratings can serve as a guide to help indicate when maintenance operations are required. Again, control valves will leak, and that leakage will steadily increase over time as the valve is cycled, but that's not necessarily a problem. If observed leakage remains within an acceptable leakage class, it is likely that no maintenance is required yet, which in turn can reduce costs associated with outages and repairs.

What could happen with a valve that is not tested to ANSI/FCI 70-2?

If a valve is not production tested to the industry standard, ANSI/FCI 70-2, it is difficult to confirm if the valve's shutoff performance is within expected margins prior to being installed. It also makes it more challenging to directly compare the suitability of one valve relative to another.

Depending on the service fluid, the potential ramifications of excessive leakage could be significant:

- **Energy Loss** – If a control valve does not shut tightly when it closes, a portion of the service fluid will leak past the valve. For a heat transfer fluid such as steam, any leakage will result in more steam being generated needlessly, which will likely lead to significant energy loss and higher operating costs.
- **Increased Maintenance Cycles** – When a valve's trim is seated but still leaking significantly, the velocity will increase across the seating ring and control element. This will increase the wear of the trim, thereby increasing the leakage even further over time. The valve trim, or potentially even the entire valve, will require repair or possibly replacement to resolve resulting in costly outage cycles.
- **Compromised Control** – By not closing as tightly as required, the valve may cycle excessively, resulting in erratic system control. Certain processes may also be impacted by the unintended introduction of process fluid at unexpected times.

Safety – Although control valves are not designed for isolation, they often are expected to provide reasonable seat tightness to prevent pressure accumulation in the downstream piping in order to prevent safety valves from opening unexpectedly. Furthermore, unaccounted seat leakage may result in damage to other components downstream of the control valve. For combustible or flammable fluids, unexpected leakage could result in significant safety concerns.

A copy of the latest edition of ANSI/FCI 70-2, Standard for Control Valve Seat Leakage Testing can be purchased through TechStreet or IHS.