

Improved Check Valve Disc Design

Background

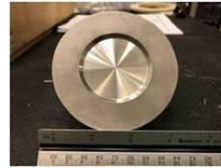
Westinghouse swing line check valves are typically installed in the following systems:

Typical Systems	Installed Quantities
Boron Recovery System	70
Boron Thermal Regeneration System	48
Containment Spray System	70
Chemical Volume Control System	698
Reactor Coolant System	46
Residual Heat Removal System	84
Spent Fuel Pool Cooling System	37
Safety Injection System	989
Upper Head Injection	14
Waste Processing System Liquid	135

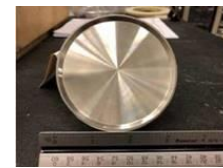
Historically, a given disc design was sized for application to multiple valve sizes and system applications. To help minimize leakage risk, Westinghouse developed a program to optimize the disc design to the valve size and application.

Description

The disc design was modified to utilize a reduced contact area design geometry as compared to the original disc design. The new design improves the seating contact surface area in order to minimize leakage risk (less contact surface area = more sealing pressure); thus ensuring that the disc-to-seat ring seal will be equal to or better than the standard seal performance.



Old Disc Design



New Disc Design

Benefits

Operating experience has shown that leakage may occur due to use (30-40 years in some cases) or a change in operating conditions (low differential pressure). The improved design can assist with leakage reduction caused by:

- Thermal cycling of adjacent piping
- Impacting Inservice Testing (IST) success
- Changes in accumulator chemistry
- Gas voids

Deliverables

- Check valve disc arm assembly (code data report, certificate of conformance, quality assurance package)
- Revised valve assembly drawing
- Design report addendum

Experience

Westinghouse has installed the new disc arm design at different nuclear power plants in 3-inch valves and 8-inch valves.