**PLANT**
Commercial Nuclear Power Plant

**LOCATION**
Southern United States

**CHALLENGE**
Two split body valves were binding internally, preventing operation. Because they were two piece valves, they required out of line maintenance, costing extra time and resources.

**SOLUTION**
Replace the existing valves with Curtiss-Wright’s maintenance friendly Enertech Cartridge Ball Valve

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**Background**
A domestic commercial nuclear power plant located in the southern United States uses moisture separators and reheaters to reduce erosion and corrosion by removing water from the saturated steam exiting the high pressure turbine and heating it, thereby providing dry, slightly superheated steam to the lower pressure turbines. The system serves no safety function and would not compromise any safety-related systems or prevent safe shutdown, but the vents and drains of these systems collect the water and return it to the steam cycle to promote operating efficiency and stability, making it key to cost effective operation. The original motor-operated ball valves were second stage steam supply valves that ran in parallel, conveying steam from a source to the individual steam reheater stages.

**Challenge**
The site observed the second stage steam supply valves binding internally, preventing their required operation. There was no appreciable flow through the second stage steam supply valves until the valves were approximately 20% open, but due to the documented internal binding, second stage steam supply valves were incapable of opening beyond 5% of full open. Because the valves were two piece (split body) valves, they would need to be repaired out of line, costing extra time and maintenance resources in a high dose zone.

**Solution**
The plant chose to replace the binding second stage steam supply valves with Curtiss-Wright’s maintenance friendly Enertech Cartridge Ball Valves. The replacement valve features a ‘cartridge design’ whereby all the valve’s internal sealing parts are affixed to the bonnet. This allows for easy accessibility and maintenance, crucially reducing dosage from the valve’s location about twenty feet above the turbine building floor in a high radiation area behind the bio-shield.

Additionally, the replacement Curtiss-Wright valves were designed to utilize a double-block application for verification of sealing. While the previously installed valves contained only an upstream seat, the dual mechanically-sealing design of the Enertech Cartridge Ball Valve provides additional assurance of zero leakage in high pressure applications. The replacement valves utilize a specially machined double offset ball that simultaneously applies independent mechanical loads into both seat faces, further ensuring the tight sealing required. The site has confirmed the leak tightness of the Enertech Cartridge Ball Valve since its installation in Spring 2016 with no issues warranting maintenance on either valve.