Dresser-Rand® Gimpel™ Valve

Conversion of LOC to OOTTV Actuator

Large Oil Cylinder to Oil Operated Trip and Throttle Valve Upgrade

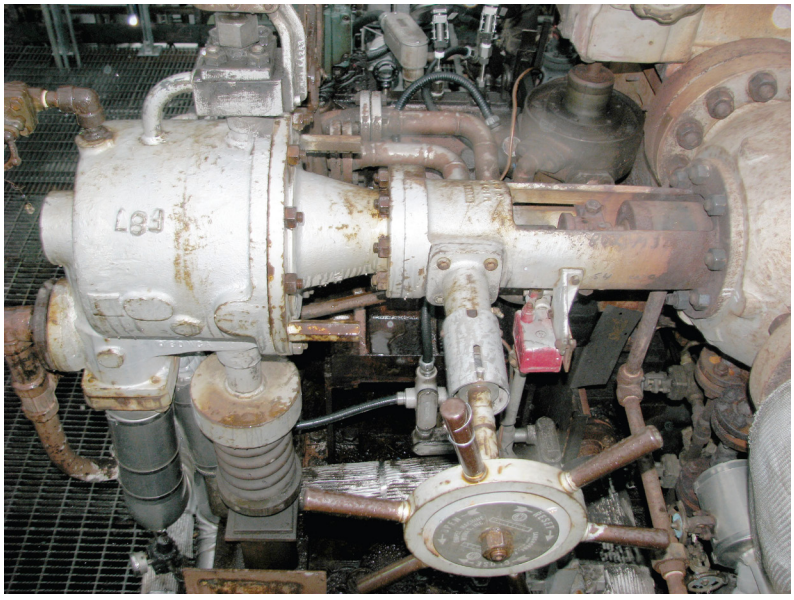
Dresser-Rand Gimpel's early design large oil cylinder (LOC) trip throttle valves can be easily upgraded to our latest technology fully oil operated trip throttle valve (OOTTV) by simply replacing the operating section. The upgrade will maintain the same pull-to-close operation, retains the original valve body, cover, leakoff and back seat bushing and internals (steam section), while providing a number of significant operating and maintenance advantages compared to its original LOC design:

- The most significant advantage is the higher closing force developed during tripping, i.e. 4,000 to 10,000 lb of closing force versus 2,000 lb for a LOC, resulting in faster, more reliable and consistent tripping during an Emergency Shut Down (ESD). The trip time of an OOTTV is 0.3 seconds, or less.

- The hand wheel of an LOC is mechanically connected to the valve stem. As the hand wheel is turned in the close / reset direction, the actuator internal spring is physically compressed. Once the valve has been reset, as the hand wheel is turned in the open direction, again the hand wheel is physically pushing the pilot / disc against steam pressure. The operation is not only labor intensive, but it also limits the spring size used in the actuator and it imposes severe stress on the moving internal parts of the coupling.

- The hand wheel of an OOTTV is not mechanically connected to the valve stem. Turning the hand wheel in the close / reset direction simply positions the metering screw located inside the actuator in the reset position. As the hand wheel is turned in the open direction again it moves the metering screw which increases hydraulic oil pressure under the piston.

Large oil cylinder



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It is this increased oil pressure that compresses the internal springs as the valve opens. This results in considerably less operator force, i.e. “power steering effect,” applied to the hand wheel to open the valve at start-up against full differential steam pressure.

• An LOC has rotating parts in the coupling and several grease fittings that require periodic lubrication. An OOTTV has no rotating parts in the coupling, all of the components involved in operation and tripping are fully enclosed in the hydraulic actuator and trip relay.

• After tripping an OOTTV the oil pressure can be reestablished regardless of the hand wheel position. In the LOC design, the hand wheel has to be reset prior to reestablishing oil pressure to prevent the valve from partially opening during resetting.

• An OOTTV provides longer operating intervals between recommended scheduled maintenance outages/inspections due to fewer rotating parts, i.e., five (5) years for an OOTTV versus three (3) years for an LOC.

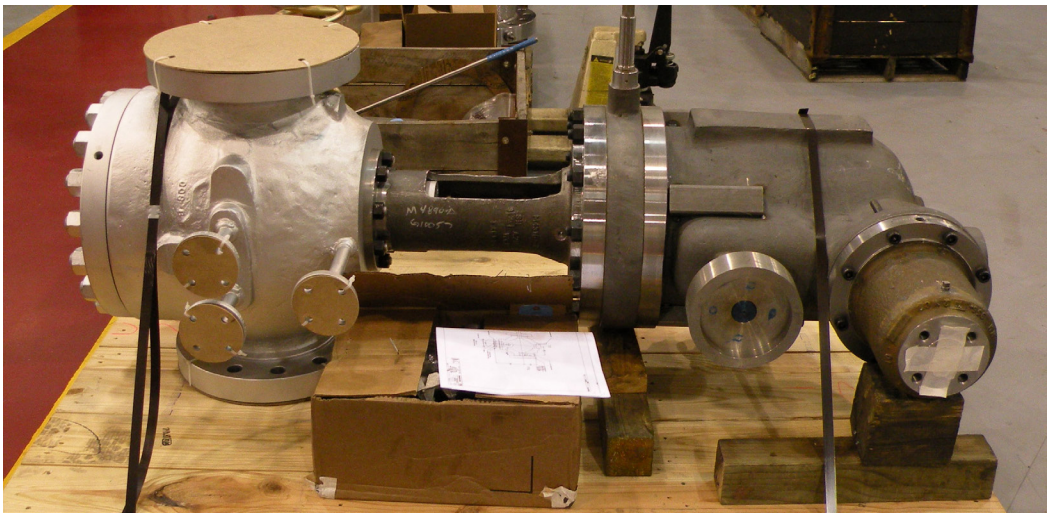
• The OOTTV has proven reliability during operation and exercising. The LOC design has been known to trip during exercising when steam and/or oil conditions were less then optimum.

The conversion is available for all size and pressure class LOC and requires a minimum oil supply pressure of 100 psig (7.0 kg/cm2g). The required oil supply pressure is determined by the size, pressure class and operating steam conditions of the valve.

The valve steam section should be inspected and overhauled prior to reassembling the valve with the actuator conversion.

The valve assembly will be given a standard factory OOTTV operational test with trip time and oil flow measured and a test report issued.

The installation will require modification of the oil supply and drain piping to meet the required connection sizes and location of the conversion and may require additional spring support due to the increased weight of the valve assembly. The valve outline drawing will provide the static loading at each valve support location.



Oil operated trip and throttle valve.

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