



Red Valve Company

Case Study

Control Valves – Natural Gas Wells – Series 9000

Application #1 *Producing Gas Wells*

A Canadian oil and gas company operates numerous natural oil wells and gas wells in remote areas of Northwestern Canada. Each gas well is equipped with a metering skid that controls the output from the well. A small trailer on the skid contains a primary throttling valve, isolation valves, metering equipment and remote telemetry to enable the skid to connect to the master SCADA system. The primary function of the metering skid is to control both the amount of flow and the pressure in the well in order to control the draw down on the well and achieve maximum production.

The natural gas extracted from the wells contains a high volume of water and sand moving at relatively high

velocities that would quickly erode metal surfaces. The company had standardized on V-Ball valves but was experiencing a range of problems. The most severe were catastrophic valve failures that would allow the entire trailer to fill with sand. This would require a replacement unit at a cost of \$150,000-\$200,000.

The entire V-ball valve experiences severe wear caused by “sanding” of the gas. Replacing the valves required a shutdown of the well at a loss of 125,000 cubic feet of gas. A six-hour shutdown results in a \$6250 loss in revenue.

Red Valve’s district sales office in Vancouver worked with the company to find a solution to the wear problem while maintaining or even improving control of the well. The V-ball valves were replaced with the Series 9000



Catastrophic failures with V-Ball valves would fill the skids with sand.

High Pressure Control Pinch Valve from Red Valve. The Series 9000 is an ANSI 300# Class Valve available with pressure ratings to 720 psi. Like all Red Valve pinch valves, the Series 9000 features a full-port opening with no obstructions and no changes in the direction of flow. The elastomer pinch sleeve is very resilient, allowing it to absorb the impact of the sand without wearing.

For installation in the metering skids, the Series 9000 valves were equipped with hydraulic actuators and Fisher Smart positioners to allow them to be tied into the existing SCADA Control System. The valves were also equipped with the latest “smart” sleeve technology that senses wear in the sleeve and signals that SCADA system to schedule a replacement. Several manually actuated isolation valves were also supplied, equipped with bevel-gear operators.

In an effort to maximize production without killing the well, the oil and gas company often kept these control valves throttled at 80-90 percent



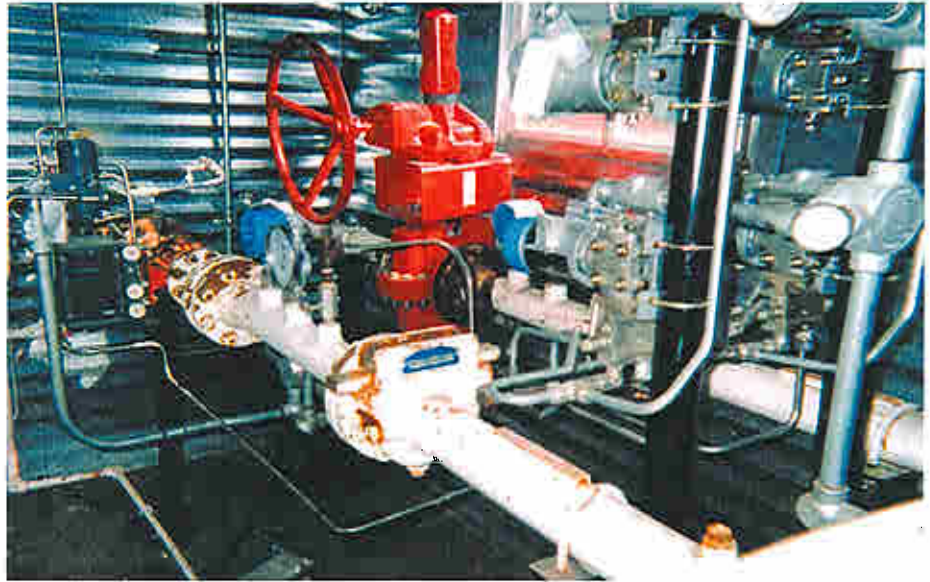
Gas wells are controlled by a metering skid in remote areas of N.W. Canada.



The Series 9000 High Pressure Pinch Valve features a "smart" sleeve and a "smart" positioner. As the primary gas control valve, the Series 9000 is reliable against sand abrasion.

closed. The mixture of sand and water could travel as fast as 150 feet per second, equivalent to sand traveling at 100 miles per hour. This highly abrasive mixture would quickly wear out the seats, seals and even bodies of metal V-ball valves.

The Red Valve Series 9000 High Pressure Control Valve was retrofitted to increase the service life of the valve and maintain tighter control. Fuel gas was used to actuate the pneumatic cylinders, and the valves



Manually actuated Series 9000 use bevel-gear actuators for ease of operation of the primary gas control valve.

were controlled by low-voltage solenoids operating on solar power.

The valves were in operation for one year with no loss in performance or maintenance required and, upon routine inspection, showed no significant signs of wear.

Application #2 *Inlet Separator*

The field gas that is captured from the wells is piped to a central location where the sand and water can be

removed. An inlet separator is used to allow the sand and water to settle out and the gas to rise. The gas collects in the top of the separator where it is pulled off by means of an air compressor, while the collected sand and water are dumped off to a produced water tank. A control valve is used to precisely modulate the amount of water that is drawn off to ensure that the level does not rise too high and enter the compressor inlet.



Inlet separator tank to remove water and sand from field gas. Series 5200 maintains level control.



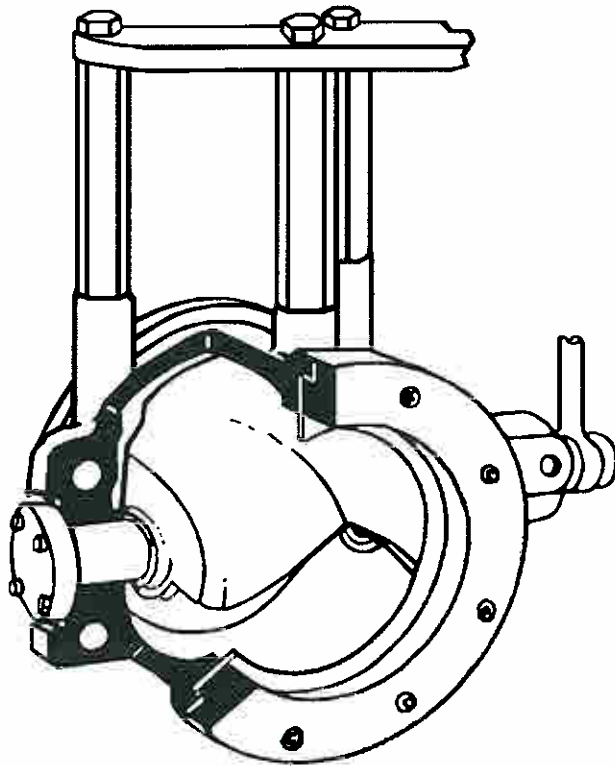
Series 5300 fitted with spring-loaded fail closed actuator for tank level control.

Series 9000 Control Pinch Valves – The Sensible Solution

Standard V-Ball Valve

Problem:

- ▶ Metal surface is subject to quick and unpredictable erosion.
- ▶ Poor throttling performance.
- ▶ Clogging due to trapped debris.



Series 9000 High Pressure Control Valve

Solution:

- ▶ Resilient elastomer pinch sleeve erodes much more slowly than standard metal surfaces.
- ▶ “Smart” technology alarm system sends a signal when replacement is needed.
- ▶ Full-port opening won't clog.

