



Natural Gas *case study*

Control Vales in Natural Gas Wells Series 9000

Producing Gas Wells

A Canadian oil and gas company operates numerous oil wells and natural gas wells in remote areas of Northwestern Canada. Each gas well is equipped with a metering skid that controls the output from the well. 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 of 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 prob-

lems. The most severe were catastrophic valve failures that would allow the entire skid 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 sand in the gas. Replacing the valves required a shut-down 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 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



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

direction of flow. The elastomer pinch sleeve is very resilient, allowing it to absorb the impact of the sand without wearing.

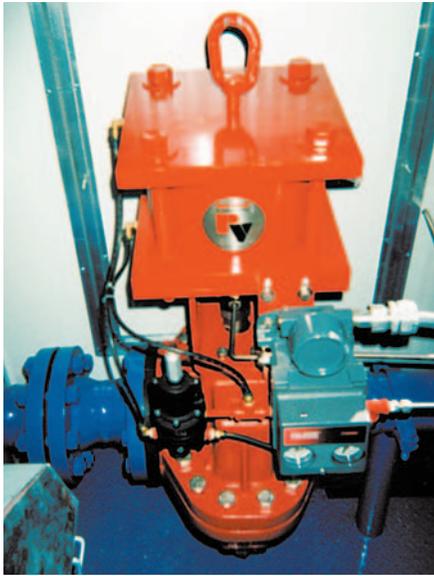
For installation in the metering skids, the Series 9000 valves were equipped with hydraulic actuators and Fisher Smart positioners to allow them to be tied into the existing SCADA Control System. The valves were also equipped with the latest "smart" sleeve technology that senses wear in the sleeve and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

In an effort to maximize production without killing the well, the oil and gas company often kept these control valves throttled at 40-50 percent closed. The mixture of sand and water could travel as fast as 150 feet per second, or 100 miles per hour. This highly abrasive mixture would quickly wear out the seats, seals and even bodies of metal V-ball valves.

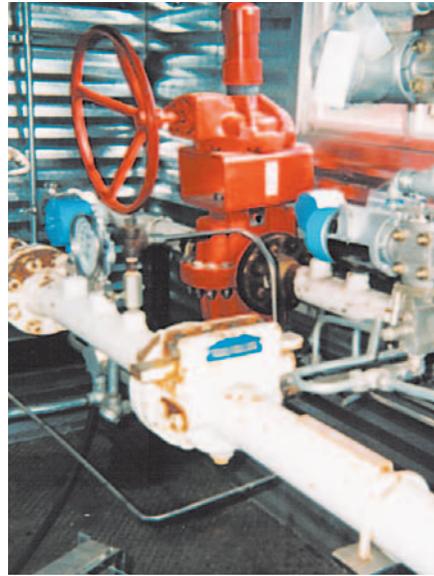
The Red Valve Series 9000 High Pressure Control Valve was retrofit-



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.



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



Series 5200 fitted with spring-loaded, fail-closed actuator for tank level control.

ted to increase the service life of the valve and maintain tighter control. Fuel gas was used to actuate the pneumatic cylinders, and the valves 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.

Inlet Separator

The field gas that is captured from

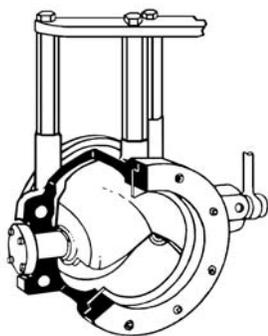
the wells is piped to a central location where the sand and water can be removed. An inlet separator is used to allow the sand and water to settle out and the gas to rise. The gas collects in the top of the separator where it is pulled off by means of a gas compressor, while the collected sand and water 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 9000 Control Pinch Valves – The Sensible Solution

PROBLEM:



Standard V-Ball Valve

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

SOLUTION:



High Pressure Control Valve

- ▶ Resilient elastomer pinch sleeve will outwear standard metal surfaces.
- ▶ “Smart” technology alarm system sends a signal when replacement is needed.
- ▶ Full-port opening will not clog.