Top UK Water Utility Demonstrates Dorot 24" S-300 Pressure Regulation Valves Fulfils Their Needs

This article is published in the WATERBIZ MAGAZINE Vol. 4, No. 1, 2012, and it is based on the article 'Gosforth Park Control Valves - a trial investigating the suitability of globe type valves being used as primary control valves on a strategic trunk mains system' provided by Brian Plemper of Northumbrian Water.

UK Water Utility Northumbrian Water has assessed the performance of Dorot's S-300 Automatic Control Valve on a strategic trunk mains system and has confirmed the reliability of the valve after two years of operation.

Dorot's S-300 valve succeeds to regulate accurately at high flows and low flows, thanks to its unique patented LTP regulation mechanism, with no need to install any bypass or V-port devices.

The main lines in the system service an area that supplies around 250,000 properties in large areas of Newcastle, North Tyneside and South East Northumberland, in the northeast of England. The area receives a 'mix' of water; half comes from the Birney Hill Reservoir gravity supply. Flow and pressure control is provided by the Gosforth Park control system, which is supplied by two 9km (6 miles) trunk mains. Due to the high proportion of the demand met by this reservoir and because of the relatively high elevation of Birney Hill reservoir, precise flow and pressure control are required at Gosforth Park.

Two plug-type valves were originally installed at Gosforth Park. Flow and pressure telemetry revealed the valves were not able to regulate pressure in a stable manner. Valves were operating erratically, and flow control vanes in the valves were damaged or missing.

After careful consideration, it was decided that these valves were inappropriate for strategic control valves dealing with volumetric flow rate where precise control of pressure is required.

The specification set out for a new valve was:

- Sustain a pre-set downstream pressure at the required flow rates.
- Downstream pressure setting must be capable of being set remotely from the regional control center.

- Pressures on the downstream side of the valve must be stable at both high flows and low flow conditions.
- In the case of a power outage the valve will fail-safe and revert to a standard pressure reducing valve with pressure setting of 57m (80 psi).

Dorot S-300 Valves, which are widely used throughout the Waterworks Market within the United Kingdom, primarily as a pressure control device (including for Non Revenue Water Projects), were deployed to determine their suitability as a strategic control valve and confirm its potential in regulating pressure in a major trunk mains system.

Performance of the new S-300 24" Control Valves has been followed up for the last two years.
For the full range of flow through the valve, i.e. 21Mld - 96 Mld (3,400GPM-14,600GPM), the downstream pressure of the valve remained within a 2m band (<3 psi), between 55m and 57m (77-80 psi).

The degree of control obtained shows that the S-300 Dorot Control Valves can be reliably used as for strategic trunk mains control in a large flow range. The graph shows the pressure and flow parameters at Gosforth Park after the installation. For the full range of flow through the valve, the pressure on the downstream side of the valve remains steady!