

CASE STUDY – Pressure Management

City West Water, Melbourne, Victoria, Australia

PRV with CRD34 Motorized Pilot, X143-IP Turbine and VC-22 Controller

City West Water provide over a hundred billion litres of water every year to 65% of the inner Melbourne population. Supplying over a million people with safe drinking water is a huge challenge, every year they are required to prepare a 'Drought Preparedness Plan' to manage a potential shortfall in water supply.

Part of this plan is to proactively reduce leakage across their reticulation networks and have set up actions to achieve this. Some of these include: active leak detection, mains renewals, rapid response to bursts and leaks, intelligent network technologies and pressure management.

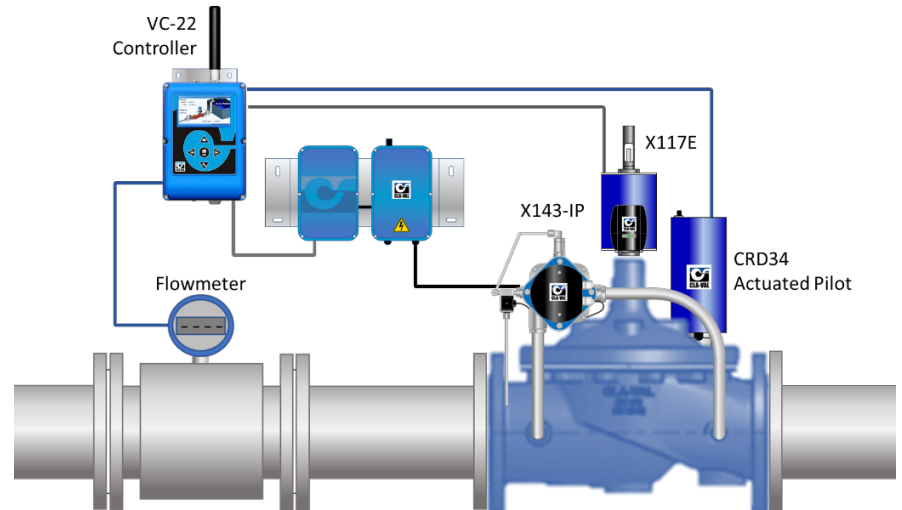
There are many Pressure Reducing Valves in their networks which serve to reduce leakage and keep their networks calmed by stabilizing pressures across the pipe system.

The new Cla-Val PRV in this DMA is servicing approximately 1200 properties which experiences very high pressures particularly in periods of low demand. CWW decided more could be done to manage pressure more effectively in the zone and further reduce unnecessary stress on hot water services, taps and their infrastructure.

CWW were seeking a robust pressure management solution that they could implement into their existing SCADA system however the cost of providing 240VAC power to the PRV was too expensive and could not be justified so CWW turned to our partners; Challenger Valves to provide a complete economical solution.



Using the programmable



As well as requiring a self-powered complete pressure management solution CWW wanted to continually monitor outlet pressure and flow however also wanted to continually monitor the stem position of the valve to provide a trend of potential unusual behaviour of the PRV.

To provide the means of pressure modulation Cla-Val proposed our CP'D34 actuated pilot. Actuating a mechanical CRD pilot is one of the most accurate methods of varying downstream pressures. In the event of a power loss the pilot remains a hydraulic pressure control pilot.

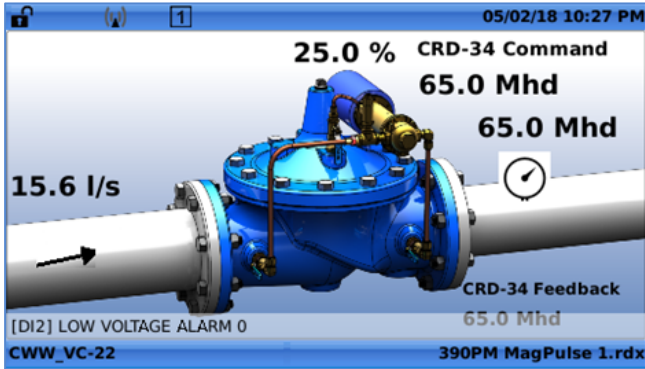
For stem position feedback we added our X117E e-Lift device which is installed centrally on the valve top cover and is attached to the stem inside the valve. This provides a 0-100% position as an analogue feedback signal. Using our VC-22 Controller enabled CWW to leave the valve in an automated state of control. Pressure Management *Valvapp* to

CLA-VAL – Pressure Management

The ONE STOP SOLUTION!!

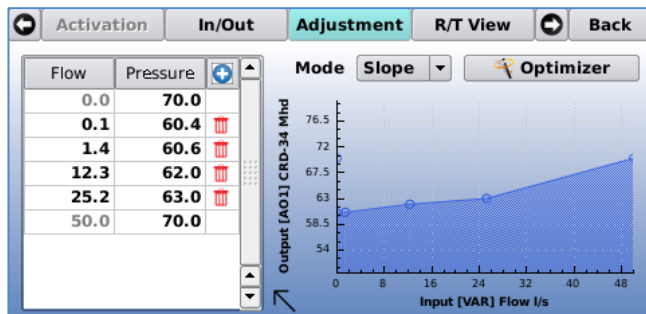
provide a flow v pressure control curve and therefore modulate outlet pressures according to changes in flow. All site information is relayed to their onsite RTU all of which is powered by the Cla-Val X143-IP 24VDC Hydro Powered Turbine.

The image shows the VC-22 'Home Screen'. It displays all the pertinent information around a visual representation of the PRV itself. It shows the valve, the CRD34 motorized pilot together with P2 pressure, the CRD34 output pressure setpoint plus the valve stem % position and flow rate from the local flow meter.



It was programmed with a bespoke 'Alarm Condition' such that in the event of an imminent power failure from the X143-IP turbine it will automatically drive the CRD34 to its default high pressure setting before power is lost. Once power is restored, the VC-22 automatically reverts to the P v F control curve.

For complete remote monitoring the VC-22 retransmits; flow, outlet pressure, CRD34 command signal, CRD34 feedback and valve % position out to the RTU and can be viewed live at all times by CWW personnel. The VC-22 also features a 'display time out' to conserve power when not in use.



The controller is extremely user friendly and was programmed to follow its own unique control curve. The graph shows monitoring incoming flow (x-axis) the outlet pressure is controlled accordingly (y-axis).

As flow demands vary throughout the day the PRV now provides the correct pressure into the network; overcoming friction losses at peak demand and lowering pressures in times of low demand, in turn, minimizing background leakage and reducing stresses on the network pipe system.

Providing a sustained and economical form of power, the X143-IP hydro powered turbine provides the complete sites 24VDC supply; VC-22, CRD34, X117E e-Lift, Pressure Sensor and RTU. The turbine works by exploiting the available differential pressure across the valve to convert kinetic energy in the water into a charging electricity supply to a 12VDC 7Ah rechargeable battery pack.

