DOROT

Aquestia
Directing the Flow

Case Study

Belfast, Ireland

Dorot S300 PRM (HyMod) saves 1.08 million liters water per day in Belfast.

Background

The water utility of Northern Ireland supplies 560 million litres of clean water a day for almost 1.8 million people as well as treating 320 million litres of wastewater a day.

Challenges Old, malfunctioning infrastructure

The utility company embarked on a project to reintroduce appropriate pressure management to a water supply zone (WSA) of 9772 properties, predominantly domestic in nature. The infrastructure in the zone was mostly characterized by old 5" cast-iron mains, installed in around 1920-1930. The poor internal condition of the pipes caused excessive low pressures at times of peak demand.

The existing electromagnetic flow meter and old piston-actuated PRV were surveyed for possible service and re-use. The flow meter was found to be non-operable, while the internal trim of the old 10" PRV was seized. Both were deemed to be beyond economic repair.

Solution Reducing and modulating pressure

Using a background leakage figure of 45 m3/hr, the flow prediction software utilized to calculate expected flow regimes into the WSA put peak flow at 287 m3/hr (79.8l/s) and minimum flow at 63.4 m3/hr (17.6 l/s).

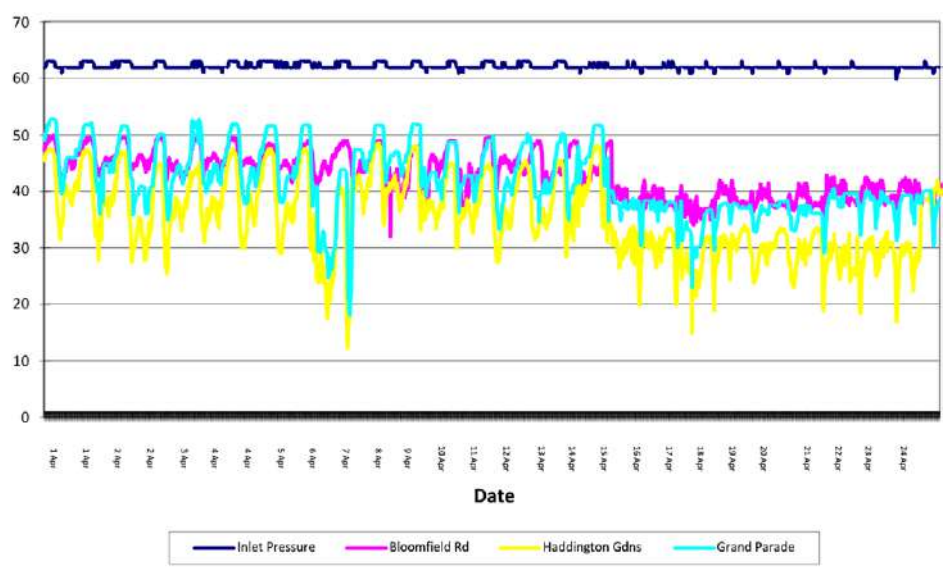
Pressure logging revealed a possible 10-12 mwc reduction in pressure, with some form of modulation at night. Inlet pressure is fixed at about 62 mwc, reduced to a modulated downstream pressure of less than 50 mwc (see graph below).

The old, malfunctioning PRV was replaced with a new, smaller, 200 mm diaphragm-actuated PRV, fitted with a DOROT S300 PRM(HyMod) hydraulic pressure modulator.

Results Over a million liters of water saved per day

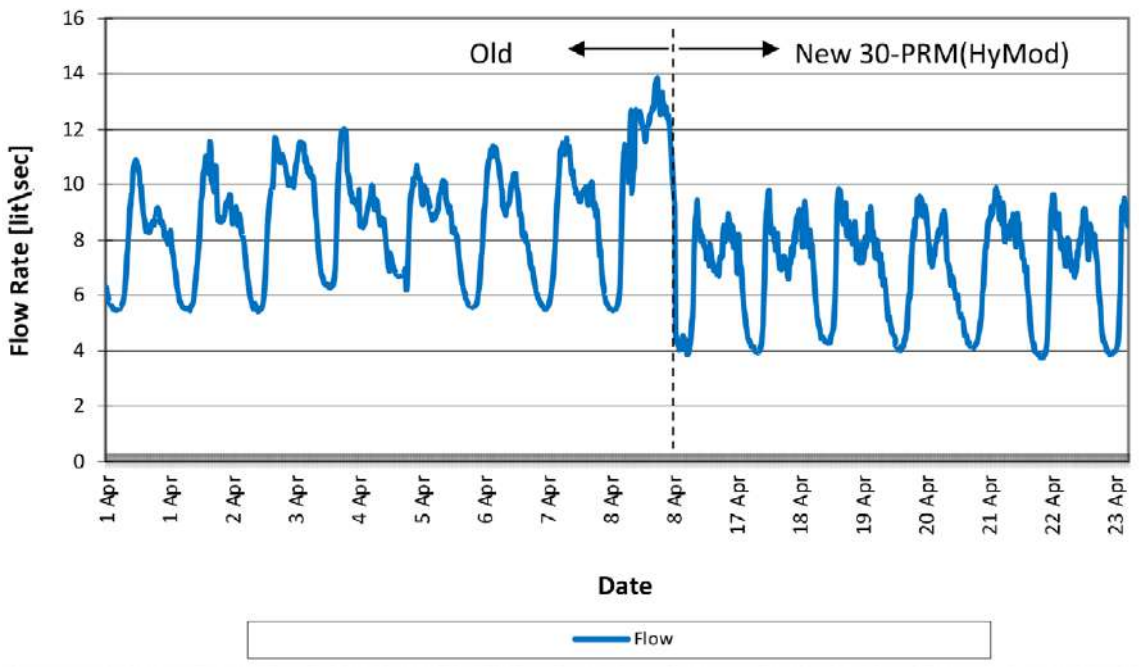
Strategically located pressure loggers demonstrated the impact that pressure management had on the water supply.

East 2 - Pre and post PRV Commissioning Pressure



Flow regime data from the sub-zone of Ravenhill Road 2 - where there are some 1236 properties – before and after commissioning of the DOROT S300 PRM(HyMod) showed a volumetric reduction of 0.13mld (million liters per day). By extrapolating this over the whole area of 9770 properties, an overall volumetric saving of approximately 1.08mld can be calculated.

East 2 - Pre and post PRV Commissioning Flow-Rates



The flow-rate graph above indicates a reduction in nightline – shown as a red dotted line - of approximately 1.5 lit/sec.

Pre-Installation		Post-Installation	
Date	Flow (m3/day)	Date	Flow (m3/day)
01/04	678.38	17/04	583.06
02/04	705.81	18/04	598.73
03/04	790.73	19/04	610.21
04/04	752.45	20/04	590.33
05/04	742.24	21/04	602.27
06/04	730.09		
07/04	737.92		
08/04	895.94		

Summary of volumetric flow data in m3/day