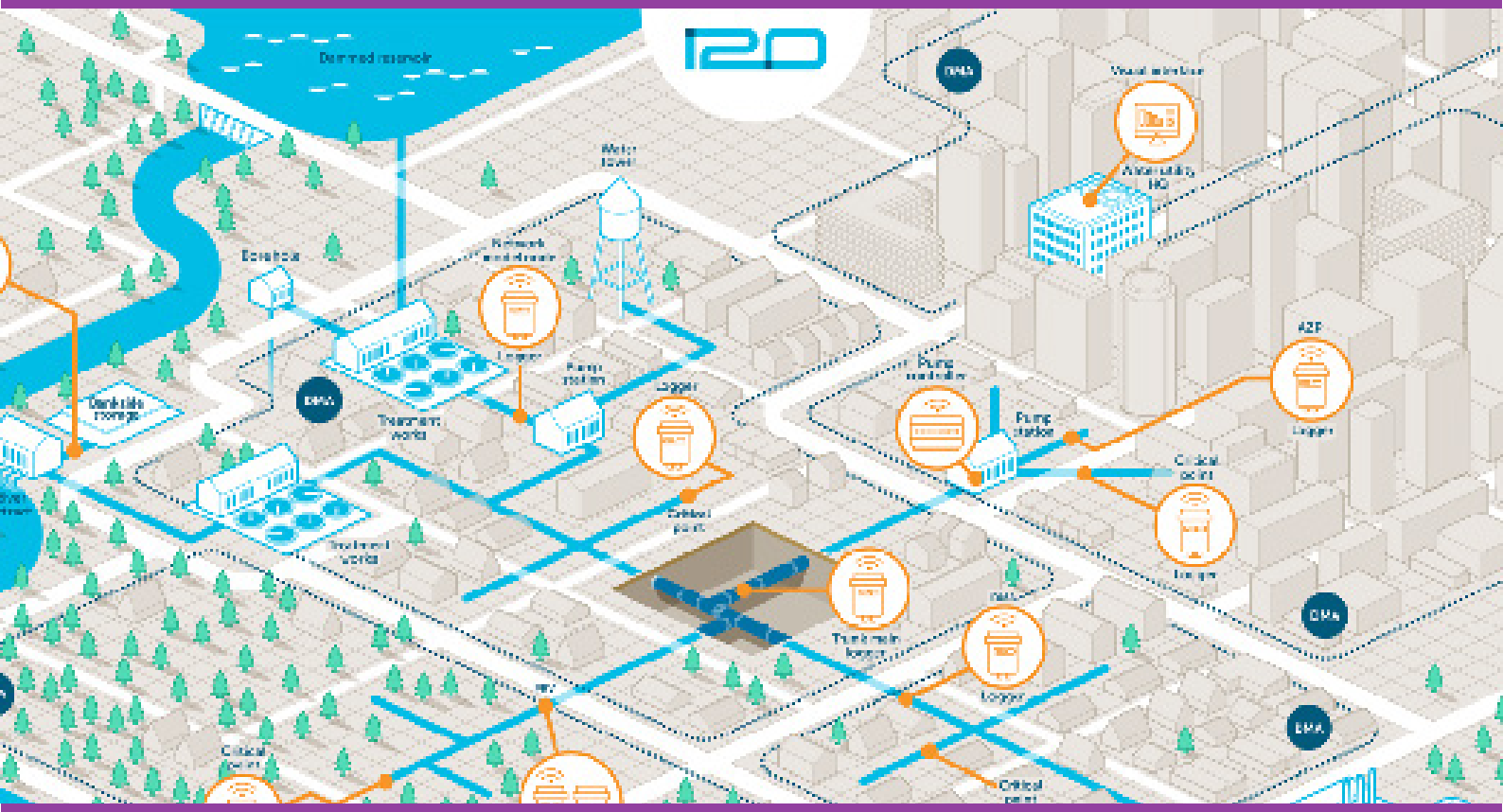
THOUGHT PIECE

Advanced Pressure Management



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THOUGHT PIECE:

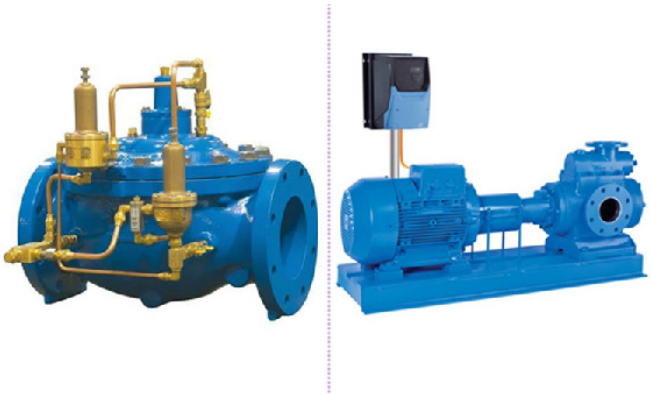
ADVANCED PRESSURE MANAGEMENT

This thought piece will help senior managers understand the advantages of advanced pressure management over standard, or even improved pressure management

PRESSURE MANAGEMENT

Either you've already implemented basic pressure management or you're planning to do so. You're subdividing your network and creating DMAs or PMAs or PMZs or TLAs (Three Letter Acronyms). We'll just call them DMAs. You're closing boundary valves and installing bulk meters at the head of each DMA. You're using a PRV, or a pump or three, or an open connection to manage pressure in a DMA.

The idea originated in the UK in the 1980s and was introduced by the UK Water Authorities Association. Its main purpose was to quantify and/or identify leakage although it relied (and in many cases does still rely) on some gross assumptions about usage and where leaks occur. But that's a topic for another day.



STANDARD PRESSURE MANAGEMENT

Standard pressure management is good in so far as it goes, but it has some quite significant limitations:

- Fixed outlet pressure does not guarantee consistent pressure at the right level to customers. The biggest reason for this is headloss between the outlet and the endpoint. The older your network and the larger the DMA the more likely this is to happen. But it can also occur because PRVs and pumps don't operate as accurately as you might hope at all levels of flow
- Factors of safety have to be large because margins for error are large. This leads to over-pressurisation of the network and faster deterioration of it
- Regular re-calculations are required. Basic DMA operation isn't fit-and-forget. Things change. If you are in a part of the world that has seasons then these significantly alter demand. If you are in a place that is experiencing population growth (and most are) then this changes demand over time. If a new large commercial user is attached to the network then this affects demand
- Significant manual effort is still required. You still have to go and maintain the assets regularly. When things change you need to revisit site to implement control updates. You need to do so to accommodate exceptional events like carnivals, football matches, and festivals. In times of water shortage you may need to ration water and again this requires site visits

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ADVANCED PRESSURE MANAGEMENT

So you're probably wondering if there's anything you can do to get more, or the most, out of your DMAs. Of course there is. It's advanced pressure management. It's not new; it's been used globally for a decade now. But what is it? Four things make it advanced:

- Accuracy: You no longer have to rely on guesswork or estimation to ensure correct pressures for end customers at all times of day throughout the year.
- Flexibility: It doesn't become obsolete the minute you install it. It adjusts to changing conditions. And if you change your mind you don't need to go and bypass or remove whatever you've installed and replace it with something else.
- Remote control: You don't have to send people to site. You can do it from your desk at work. Or in your pyjamas at home.
- Automatic optimisation: You don't need to do the calculations yourself, a system does it for you. It copes automatically with challenging scenarios and has fail-safe modes.

Advanced pressure management should not be confused with improved pressure management. It's not a trivial distinction. Improved pressure management may be better than basic or standard DMA implementation but it lacks one or more of the 4 main features of the advanced world.

So, for example, if you put a basic timed control onto a PRV then you may have improved the situation but you haven't improved flexibility or automatic optimisation. Depending on the solution you chose you may not have remote control either. Or accuracy come to that. We've seen some timers that were designed for domestic sprinklers applied to clean water distribution networks...

We know that closed loop control systems have a tendency to 'hunt' i.e. oscillate to achieve desired pressure increasing turbidity in network. Solenoids can cause sudden changes in downstream pressure which is potentially harmful to the network. A solution from a single manufacturer isn't flexible if it cannot be applied to all your existing assets. And so on. But if you have accuracy, flexibility, remote control and automatic optimisation then it's happy days. Because advanced pressure management can reduce leakage, bursts, supply interruptions, energy costs, and maintenance costs, and extend asset life. It can improve service to the customer with fewer quality issues, interruptions, and complaints. All by up to 60%.

HOW DOES IT WORK?

So how does it work? There are four simple components:

- Pressure/flow sensors
- Software
- Controllers
- Actuators

Sensors gather accurate data from the network. Software allows you to set parameters and instruct changes; it uses algorithms to optimise control for you. Controllers and actuators carry those instructions out on PRVs or signals get passed to existing control systems for pump stations.

So, if you're looking to get the most from your existing DMAs, or to get your DMAs operating to the max from the word go, you should be specifying advanced pressure management.

Don't forget to read the companion piece 'Tendering for advanced pressure management solutions' if you want to know how to select the best supplier to meet your needs.

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