

# Transient Events: Capturing the True Magnitude

## Early Notification

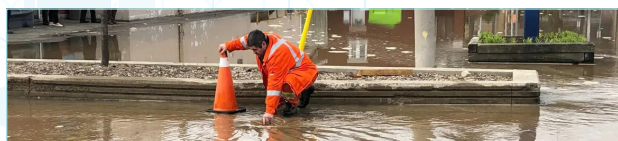
Main breaks can lead to catastrophic events – asset failure, road collapse, building flooding and boil water advisories. Utilities often are reacting to these events when a call is received from a local resident that notices water running down the road or finds that their shower pressure is much lower than expected.

Digital Water Solutions proven and patented technology, listens for main breaks using acoustic sensors in the water column and identifies pressure drops that fall outside of the normal operating range. Having early notifications of pressure events that are indicative of a main break can give utilities an early start on responding to and repairing a break.

## Pump Operation

A water utility was aware that each time they operated one of their pumps they would often receive calls from residents due to main breaks. The utility knew that to limit the impacts of starting the pump they were planning to install VFDs at the pump station. Prior to installing the VFDs the utility wanted to be able to quantify the impact on the distribution system of the across the line starters. To do this they captured the transient generated when starting and stopping the pump. The pressure wave generated resulted in a 25-30psi change in pressure from normal operating pressure.

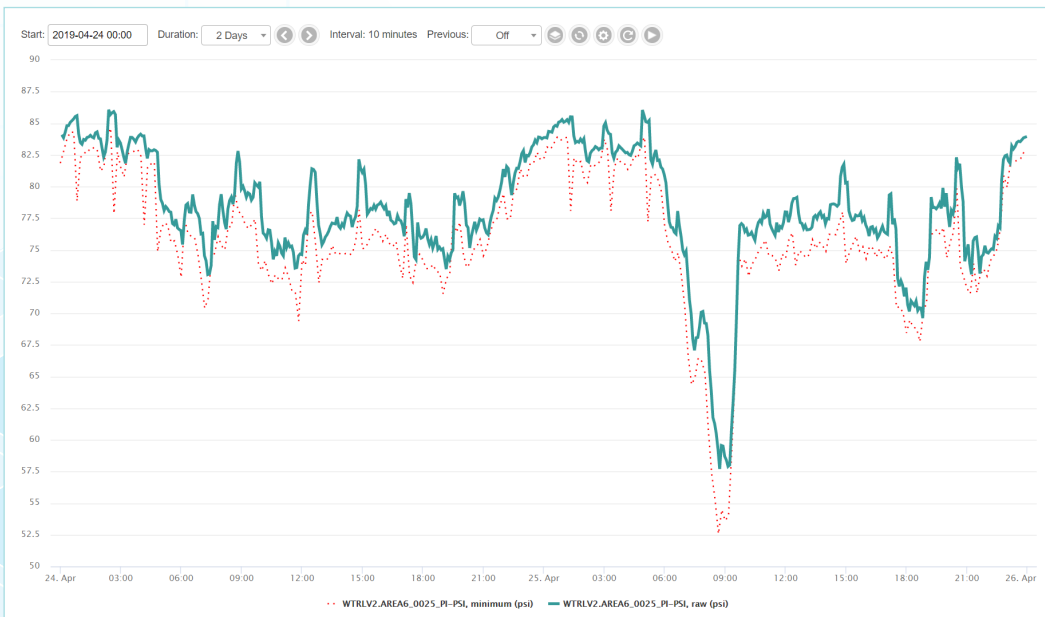
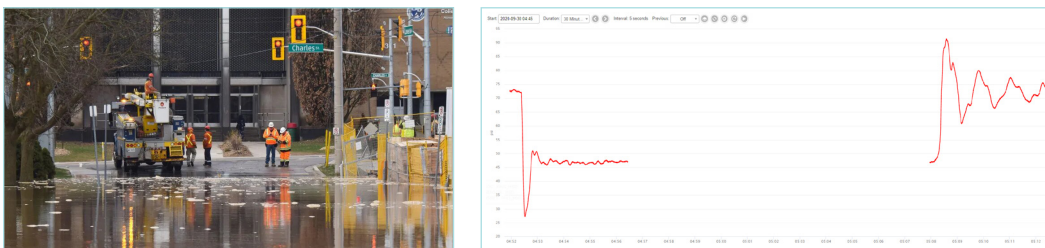
The same test was completed following the installation of the VFDs and it was found that the pressure changes on starting/stopping had been reduced to ~ 5psi. This change has lowered the number of water main breaks in the area.



## System Characteristics

The ability to identify transients within the distribution system and to associate them with other events that may be occurring – fire, water theft, valve opening/closing, swabbing or pump operation – allows an operations team to quickly identify opportunities for transient mitigation in their operational procedures. Whether transients are a result of how the system is operated, or if they are a result of main breaks, transients can have a significant impact on piping infrastructure that is already old and decaying. Even new pipe infrastructure that is not correctly installed can be negatively impacted by transient events.

Being able to capture transients using the Digital Water Solutions technology at 100 samples per second for five-minute period allows the team to visualize the waveform and the duration over which the impacts of the transient event last within the system.



**Being able to capture system transients within the water distribution system allows operational teams the ability to review the impacts of operational decisions – both occurring within the distribution system infrastructure and from the associated pump stations.**