

## 18. Transient problems across our water network - Transient Modelling Pilots

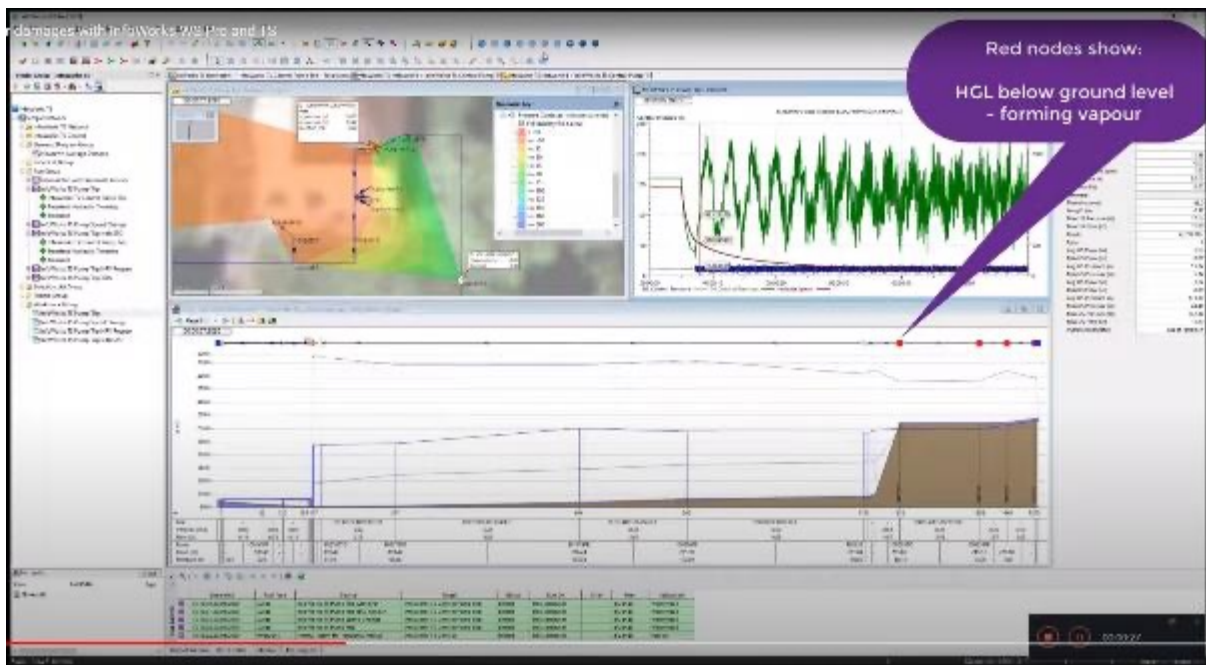


### Situation

Transients, also known as surge or water hammer, are caused by sudden changes in flow across a water network. They are often caused by quickly opening or closing valves, sudden draw-offs by customers or pumps suddenly switching on or off where surge is not adequately suppressed. A transient wave travels up and down the pipe causing large spikes in pressure over a very short duration, and this can result in burst mains and unplanned interruptions to supply. In certain circumstances negative pressures can result in pipe cavitation or the intake of contaminated water through poor designed fittings.

### Action

A pilot is underway to install transient loggers in the parts of the network suspected to experience transient pressures, prioritised on their impact on customers. These logged results will be used to calibrate the model using the Infworks TS transient module, and this model will be used to predict the most likely root cause.



### Results

Transient analysis will help identify the root cause of transients and inform capital and operational decisions. The modelling will provide evidence to aid NI Water's engagement with customers to smooth their diurnal flow profile through making better use of a customer's on-site storage tanks or by encouraging the customer to retrofit controls on their internal plumbing system. If necessary NI Water may need to install flow modulation on a customer's supply pipes to provide a minimum level of pressure service to all customers. The modelling may also help develop solutions for improved controls on Water Pumping Stations, booster stations and pressure reducing valves.

The outcome will be a reduction in bursts and unplanned interruptions with an associated reduction in OPEX costs. It will also improve the pressure level of service to customers.