

### Fault detection and diagnosis of pipeline in water distribution network system

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Water pipe network is installed underground and once equipped, it is difficult to recognize the state of pipes when the leak or burst happens. Accordingly, post management is often delayed after the fault occurs. That makes the magnitude of pipe loss bigger and bigger. Therefore, the systematic fault management system of water pipe network is required to prevent the accident and minimize the loss. In this work, we develop online fault diagnosis system of water pipe network that detects the fault and diagnoses the location and cause of the fault using online data of pipes such as flow rate or pressure. The transient model describing water flow in pipelines is presented and simulated using Aspen Custom Modeler. The fault situations such as the leak or burst can be also simulated and flow rate or pressure data when the fault happens are collected. The faults are detected using statistical methods of CUSUM, Fourier transform, and wavelet transform and compared to find which method shows the best fault detection and diagnosis performances.