November 30, 2020

Revised Draft Proposal:
Pressure Management in Water Loss Control Regulation

Impact of Pressure on Leakage

High water pressure in a distribution system increases strain on water distribution infrastructure, exacerbating chronic seepage areas or small leaks, and increasing the likelihood of pipe bursts and failures. It is well established in water loss control literature and supported by case studies[1] that reducing pressure reduces leakage volumes, especially when leaks are too small to be detected by leak detection equipment. Water hammers or pressure transients can also stress components and increase pipe bursts and other distribution component failures. Common causes of pressure transients are rapidly opening or closing valves or rapidly starting or stopping pumps. Transients can be reduced by controlling valve and pump changes or by installing surge tanks.

Prior proposal

In the State Water Board's prior draft, the economic model to calculate volumetric standards for real loss included a component to evaluate the feasibility of pressure management and calculate the associated feasible volumetric reduction in real loss. Several public comments highlighted the utility-specific nature of the applicability of pressure management. Utilities must strike a delicate balance between maintaining water quality and meeting fire flow requirements on the one hand, and reducing excessive pressures that could increase bursts and leakage in the system on the other.

The State Water Board proposes that urban water suppliers respond to this questionnaire by 2024 and provide updated responses by 2027.

Proposed regulatory requirement

<u>Urban water suppliers shall provide responses to the following by 2024 and provide updated responses in 2027, as indicated[2]:</u>

1. Devices that water utilities utilize to control pressure transients in the water distribution system include slow-opening control valves, careful pump start/stop processes, variable frequency drives (VFD) on pump motors, and installing pressure relief valves or surge tanks such as hydro-pneumatic tanks. Does your agency utilize any devices to control pressure transients in the water distribution system (on a temporary or permanent basis)?
   - ☐ Variable Frequency Drives on distribution system pumps
   - ☐ Slowly actuated control valves in line with distribution system pumps

[1] Lambert, A. et al, (2017), Pressure: Leak Flow Rates Using FAVAD: An Improved Fast-Track Practitioner's Approach, Computing and Control for the Water Industry
Water Research Foundation, Report 4321, 2014, Pressure Management: Industry Practices and Monitoring Procedures

[2] Suppliers meeting proposed criteria for low real loss and high data quality would be exempted from the requirement to respond to this questionnaire.

- ☐ Pressure relief valves
- ☐ Surge tanks or hydro-pneumatic tanks
- ☐ No such devices utilized (skip questions 2, 3 and 4)

2. Does your agency have a program to regularly inspect, maintain and repair devices installed for controlling pressure transients in the distribution system so that they are maintained in working condition?
   - ☐ Agency has a program to regularly inspect, maintain and repair installed pressure transient control devices for ___ % of the distribution system in miles annually.
   - ☐ Agency plans to have a program to regularly inspect, maintain and repair installed pressure reducing/modulating valves beginning in the year _____ for ___ % of the distribution system in miles annually.
   - ☐ Agency does *not* plan to have a program to regularly inspect installed pressure transient control devices. (skip question 4)

3. Does your agency have a program to regularly inspect, maintain and repair pressure reducing/modulating valves in the distribution system, so that they are maintained in working condition?
   - ☐ Agency has a program to regularly inspect, maintain and repair installed pressure reducing/modulating valves.
   - ☐ Agency plans to have a program to regularly inspect, maintain and repair installed pressure reducing/modulating valves beginning in the year _____.
   - ☐ Agency does *not* plan to have a program to regularly inspect, maintain and repair installed pressure reducing/modulating valves. (skip question 4)

4. On an average, how frequently does/will your agency inspect each device installed in your system for controlling pressure transients to maintain them in working condition?
   Once every ____ years

5. Has your agency identified portions of your system or pressure zones that have high operating pressure (80 psi or higher)?
   - ☐ Agency has identified high leakage zones in the distribution system
   - ☐ Agency plans to have identify high leakage zones by the year _____. (skip question 6)
   - ☐ Agency does *not* plan to identify high leakage zones. (skip question 6)

6. Has your agency evaluated the potential for reducing or modulating pressure for reducing leakage in these zones? Include pressure reduction/modulation during low demand periods as an approach for pressure reduction, if your agency evaluated that.
   - ☐ Agency has evaluated potential for pressure reduction for high leakage zones. (skip question 7)
   - ☐ Agency plans to evaluate potential for pressure reduction for high leakage zones by the year _____. (skip question 7)
   - ☐ Agency does *not* plan to identify potential for pressure management for high leakage zones. (Skip question 8)

For 2027 only:

7. If your agency has *not* evaluated or planned to evaluate the potential for reducing or modulating pressure for reducing leakage in identified high leakage zones, how does your agency plan to reduce the leakage in these zones?

   ☐ Prioritized asset management
   ☐ Leak detection and repair
   ☐ Reduction of time passing between report of leak or break and repair
   ☐ Agency does not plan to reduce leakage in these zones.

8. Based on your agency's evaluation of potential for reducing or modulating pressure, has your agency determined if pressure management can be implemented while meeting water quality and fire flow requirements for the distribution system?
   ☐ Yes, pressure management can be implemented in portions of the distribution system.
   ☐ No, pressure management cannot be implemented in portions of the distribution system. (enter zero as a response to question 9)

9. Provide the estimated feasible water loss reduction (acre-feet per year) as a result of your agency's pressure management approach, projected through 2035. If your agency did not plan to evaluate the potential for reducing or modulating pressure for reducing leakage in identified high leakage zones, provide the estimated feasible water loss reduction using your agency's chosen alternative approach. _____