Ergs, Joules & Other Stuff

Notes On Energy and Other Issues for the Rural Water Community and Maybe Others

Last month we began discussing regulatory issues and this month I thought it would be helpful to begin reviewing some operational practices that can have bearing on these issues. **Line flushing** is one such practice and probably a tool that every small system operator is familiar with. As we all know, dead end lines are common in many small systems and can cause numerous problems that are frequently resolved by flushing. As we move from hot summer months into colder times with increased possibilities for changes in water quality, this tool may find increased use and it’s important that it be done efficiently.

Much has been and continues to be written about flushing and a mild literature review seems to indicate that unidirectional flushing is the most common and recommended practice. Ken Mercer in an AWWA Opflow article in December of 2010, *How Important Is a Systemwide Flushing Program?*, in addition to unidirectional flushing discusses two other approaches:

- Conventional Flushing which usually involves opening several hydrants to replace questionable water, but with velocities insufficient to scour lines, and
- Automatic Flushing where blow-offs are turned on automatically, usually at system dead ends.

Mercer concentrates his discussion on unidirectional flushing and specifies that it involves isolating a loop or section by closing appropriate valves and moving water through this area in a direction away from the water source at velocities sufficient to scour the lines.

C. Robert Reiss and his co-authors in an earlier Opflow article in March of the same year, *Unidirectional Flushing*, discuss this procedure in more detail and make the following points:

- Flow velocities should normally be between 5 and 10 feet per second (fps). (An AwwaRF study in 2003 indicated that velocities in the 1.5 to 2.0 fps range should remove loose particles)
- Flushing time should be enough to flow water equal to twice the pipe volume.
- Valves should be located and operated before flushing.
- Water quality measurements before and after flushing will demonstrate its value – Reiss reports that in one instance iron was reduced 85%, chloramine residual increased 32% and turbidity dropped 75%

There seems to be no question that flushing is worth the effort. If you are going to spend the time, effort and water to conduct a flushing program, consider using a planned approach similar to unidirectional flushing as opposed to simply opening some hydrants to satisfy a customer complaint.

(I know you’ll be glad I resisted the urge to include a “flush Joke”. There are a million of em)

John E. Regnier, NRWA
highpnt@mindspring.com or (334) 462-1541