

# Water Emergency: Time to Consider All Options to Reduce Water Losses

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On January 17, 2014, California Governor Jerry Brown declared a drought emergency and urged residents to reduce water use by 20 percent statewide. Reducing consumption is obviously the right thing to do, but there are other options that could be implemented by water companies that can have immediate and significant reduction results without relying on the actions of individual customers and businesses.

Pressure Management is one of the key parameters that allow water distribution systems to operate at peak performance while reducing water loss. Too little pressure renders a system incapable of supplying the needs of customers and compromises water quality. In the worst-case scenario, not having enough pressure severely hampers the ability to deliver adequate flow for fire fighting (fire flow).

Conversely, having too much pressure leaves a system vulnerable to pipe breaks and background leakage. In fact, small, undetected leaks often represent a higher proportion of water loss than larger reported leaks or pipe breaks. Many systems experience between 10 -20% of water loss through leakage. According to pipe industry research, "All told, leaking pipes lose some 2.6 trillion gallons of drinking water every year, or 17% of all water pumped in the United States. This represents \$4.1 billion in wasted electricity annually" (as reported by [www.watermainbreakclock.com](http://www.watermainbreakclock.com)).

Stories of leaking pipelines are rarely talked about in mainstream news stories but catastrophic water main breaks make the headlines every time they occur and there is strong evidence that the age of piping is a significant contributor those pipe failures. In a recent Utah University Study: **Water Main Break Rates in the USA and Canada: A Comprehensive Study** by Steven Folkman, PhD, P.E.:

"Our water infrastructure is now in decline after decades of service. The signs of distress surface daily as water mains break, creating floods and sinkholes. The loss of water service is more than an inconvenience, since it causes significant social and economic disruptions and jeopardizes public health".

Everyone can agree that water loss through pipe breaks and insidious leakage is highly undesirable. It hurts people, damages property and becomes even more detrimental when coupled with drought conditions like those California is experiencing. Water loss is also very expensive. In a November 2010 report published by the United States Environmental Protection Agency: **Control and Mitigation of Drinking Water Losses In Distribution Systems**, one Eastern US water utility's value of water losses in one year topped \$32 million. Other water companies throughout the US also reported value losses in the millions of dollars.

All things considered, older pipelines are prime candidates for the implementation of active pressure management measures that can significantly reduce water losses caused pipe breaks and background leakage.

## Simple Solutions for Immediate Results

Pressure Reducing Valves (PRVs) that control pressure are the ideal solution to effectively manage water distribution pipeline pressure. PRVs do this in any of three ways:

1. Simple Hydraulic Pressure Reducing
2. Advanced Hydraulic Pressure Reducing
3. Electronic Pressure Reducing



## Water Emergency: Time to Consider All Options to Reduce Water Losses (continued)

### Simple Hydraulic Pressure Reducing

A Pressure Reducing Valve (PRV) reduces a higher inlet pressure to a lower outlet pressure (lower pressure = less loss). The valve maintains a constant outlet pressure regardless of demand so it does not actively manage the pressure.

### Advanced Hydraulic Pressure Reducing

An Advanced Hydraulic Pressure Reducing Valve reduces a higher inlet pressure to a usable outlet pressure based on flow utilizing a dual-stage pilot control with two pressure set-points. As the flow decreases, the valve senses the decrease and reduces the pressure to the level necessary for current customer demand, as opposed to continuing to maintain excess pressure that is not needed and may cause leaks or pipe bursts. This “pressure on demand” or “active pressure management” capability keeps the system from being over-pressurized, while ensuring adequate fire flow.

### Advanced Electronic Pressure Reducing

Advanced Electronic Pressure Reducing Valves have the capability of reducing the pressure in a system based on a flow/pressure profile that is loaded into an electronic controller which will monitor flow and pressure and adjust the valve according to a set of rules established by the system operator. An Electronic Pressure Reducing valve easily fits into water utility SCADA control systems to allow remote adjustments to pipeline pressure levels, again, actively managing pressure.

### Proven Pressure Management Solutions Provided by Cla-Val

Cla-Val, a leading manufacturer of automatic control valves, has been providing an array of solutions to help reduce water consumption and loss through the use of control valve technology for over 25 years.

While there are parts of the world that have been forced to adopt pressure management strategies, there has not been the same sense of urgency in the US, mainly due to the fact that we have generally had enough water to go around.

How would Cla-Val Pressure Management Solutions be beneficial in the reduction of water loss?

- Cla-Val’s main business is reducing a higher pressure to a usable pressure by the public
  - Cla-Val Pressure Management Solutions address the conditions that make pipelines susceptible to leaks and pipe breaks:
    - When public consumption goes down, the pressure goes up, exceeding what is needed to meet current demand
    - When the pressure in the system rises beyond what is needed, more water can be lost due to increased leakage and pipeline burst or breaks
  - Existing system valves are candidates to be upgraded to one of the three aforementioned pressure management options with a minimal capital investment and the potential for significant water savings
1. **Simple Hydraulic Pressure Reducing: Cla-Val Model 90-01**
  2. **Advanced Hydraulic Press Reducing: Cla-Val Model 98-06**
  3. **Advanced Hydraulic Pressure Management Valve: Model 390-07**

Regardless of the means or product used to control pressure in a water distribution system, active pressure management is an obvious and simple way to prevent or minimize water loss. It has been successfully used in the United Kingdom, France, Australia and other countries throughout the world for decades. Perhaps the time has come to use existing technology that is economical and easily accessible to do more to protect our dwindling water resources while we deal with the drought that is plaguing the State of California.

