



Howard Heil

Main breaks inspire  
public works  
supervisor to get  
inventive

# Surge Suppressors

*In 1973, Howard Heil was named the first full-time public works employee for Burr Ridge, Ill. He took his responsibility very seriously. As the supervisor of sewer and water systems, Heil looked for innovative solutions to problems—solutions that would serve residents and save money for the Chicago suburb.*

Heil inherited three subdivisions with problematic cast-iron pipes. As Burr Ridge grew, more water was pumped; as a result, turbulence and breakage problems escalated dramatically. The Carriage Way subdivision alone had a record of four breaks in one day.

"At Carriage Way, just a few breaks were caused by pipe corrosion," Heil said, "but most were circumference breaks or blow-outs at weakened sections of pipe as a result of distribution systems' worst enemy: water hammer."

Heil had some challenges on his hands, but he also possessed an innate understanding of the hydraulics of water distribution systems. Because of the problems in Burr Ridge, the sewer and water systems supervisor invented a surge suppressor that vastly reduces water main breaks in water distribution systems. It is estimated that many systems now are saving millions of dollars by prolonging the life of water mains without costly upkeep.

"We're an old village, and we used to have around 150 water main breaks a year," said Terry Botterman, water distribution foreman for Arlington Heights, Ill. "We had two especially problematic areas with water mains originally placed through backyards. Any breaks had to be hand-dug—a huge expense. We researched replacing the water main in just two areas, and the estimates

came in around \$6 million. Impossible. Instead, we replaced hydrants with Howard's suppressor attached and we've had no main breaks in two years."

## Main Issues

Researchers agree that contamination in public water systems often occurs during a water main break. Furthermore, repairs may be costly, dangerous and time consuming.

Consider the following:

- In the U.S., there are 240,000 water main breaks annually, according to the U.S. Environmental Protection Agency.
- Each day, 7 billion gal of clean drinking water is lost to pipeline failure.
- According to the American Society of Civil Engineers, drinking water systems will experience a yearly shortfall of at least \$11 billion to replace deteriorating systems.
- Over the next 20 years, it is projected to cost at least \$300 billion to upgrade pipelines.
- Between 1950 and 2000, the population of the U.S. has more than doubled, usage of water per day has increased by more than 200% and per capita usage has risen by 20%.

Clearly, protecting a water distribution system is crucial.



Distributed volumes can significantly reduce fluid transients capable of damaging water distribution systems.

## Enter the Inventor

Heil knew that if he could limit or minimize the effect of water hammer, fewer pipes would have circumference breaks and blowouts. He began to experiment with an apparatus for the pipes in Burr Ridge and neighboring Tri-State Village. He made a prototype for the first surge suppressor for one of the subdivisions, and it was installed in February 1992. The water hammer-related breaks ceased dramatically.

During a hydrant replacement program in the Carriage Way subdivision the following year, several more suppressors were installed. These allowed for bypassing of the pressure-reducing valves and restoration of full-pressure and adequate fire flows.

"Any one break is a random occurrence," Heil said. "Frequent breaks are problematic, especially because residents abhor shutdowns, boil orders or street and driveway repairs."

When breaks occur, money spent on manpower and materials drains the budget, and crew safety requires extra training time and specialized equipment. No one wants to experience a water main replacement, let alone repair. A few breaks are tolerable, but total replacements are staggeringly expensive and disruptive.

For example, Jim Barnes, water superintendent for the village of Hodgkins, Ill., said: "We were averaging anywhere from 20 to 30 breaks a year, and this was costing us a lot of money. We started installing [Heil's surge suppressors] in our system, and at this point in time, we probably average one [break] a year."

## Industry Response

According to mechanical engineer Robert E. Henry, Ph.D., there is a strong technical basis for why distributed volumes, such as in

Heil's surge suppressors, virtually eliminate the strong fluid transients that can damage water distribution systems. Henry is known worldwide for his work in heat transfer, water hammer and two-phase flow.

"The implementation of such a distributed compressible volume system as presented in Heil's patent can greatly extend the life of current distribution systems and correspondingly reduce the maintenance cost," Henry said.

Heil retired from Burr Ridge, and in 2001 his company Heil2O Inc. was founded officially. The company is the only known provider of water-hammer surge-suppression devices protecting water distribution systems. While Heil holds the patent, the device is manufactured, sold and distributed in America by JCM Industries in Nash, Texas.

Heil stays involved with the American Water Works Assn. and is a dedicated member of the water conservation committee. He continues to assist the manufacturer with the promotion of the surge suppressor at seminars and product shows. Product shows are particularly gratifying when satisfied customers tell him about positive outcomes.

One of his favorite moments on the product show circuit is when a public works manager playfully hugged the displayed suppressor and said, "This baby has saved us a lot of money."

Inventing is contagious for Heil. He holds two additional patents that, once in production, will aim to save the water industry significant amounts of money. News of these products is forthcoming and will be announced on the website [www.heil2owater-solutions.com](http://www.heil2owater-solutions.com). www

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