

The Role of Pressure Management in Real Loss Reduction Programs

by: Julian Thornton (Author of "Water Loss Control Manual")

There are almost 6 billion people in the world today and water is the human body's second most urgent need after the air we breathe. Even so the world-bank recently reported that over 1 billion people in the world still lack access to safe drinking water.

28 countries in the world do not have sufficient water to meet growing demands yet many water suppliers in the world cannot account for large volumes of the water they supply. In North America alone water loss is thought to be in excess of 6 billion gallons per day which is more than enough to meet the water supply needs of the 10 largest cities in the USA!

In order for utility managers to better control losses it is first important for them to be able to identify the components of loss, and the volumes and values of loss related to each component so that they may properly select implementation programs to reduce the water loss in a sustainable and cost effective manner.

Components of loss

Using standard methods of water auditing currently recommended by both the International Water Association (IWA) and American Water Works Association (AWWA) water loss is divided into two key components¹:

- Apparent loss
- Real loss

Apparent losses are subdivided into:

- Losses associated with metering
- Losses associated with data handling
- Losses associated with theft and illegal connections

Real losses are "physical losses" and are subdivided into:

- Losses at storage
- Losses on transmission mains
- Losses on distribution mains
- Losses on service connections (up to the point of measurement)

During the water audit volumes and values of loss are identified and validated and meaningful targets are set.

Apparent losses are almost always valued at some average retail value while real losses range from being valued at marginal production cost to many times more than marginal production cost where a utility is able to defer a capital construction project or a new source by reducing real loss.

It is important to note for those utilities which may have scarce resources that recovering apparent loss will in all cases increase the revenue stream of the utility but will not increase available resource whereas reducing real losses will effectively supply new water resource.

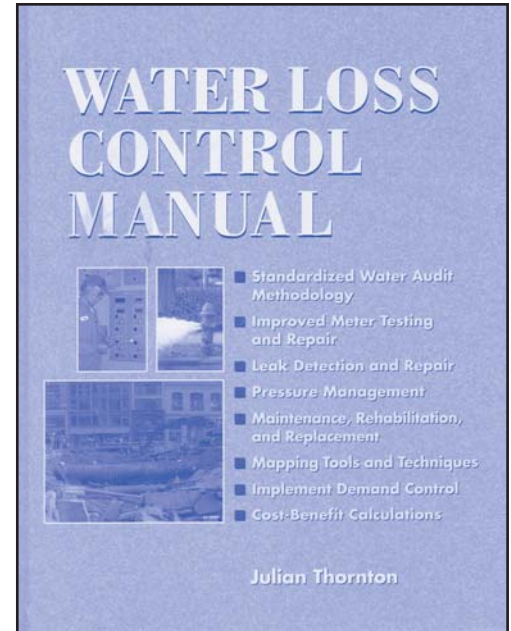
Recovering real losses is often the cheapest new source of water.

Tool box of intervention options

Once the volume and value of the losses has been properly quantified the utility must identify the most effective tools to reduce the loss.

The diagram in Figure 1 shows the four key tools used in a proactive real loss management program².

The larger square represents the current annual real loss volume.



Julian Thornton is the Author of "Water Loss Control Manual" Published in June 2002 by McGraw Hill

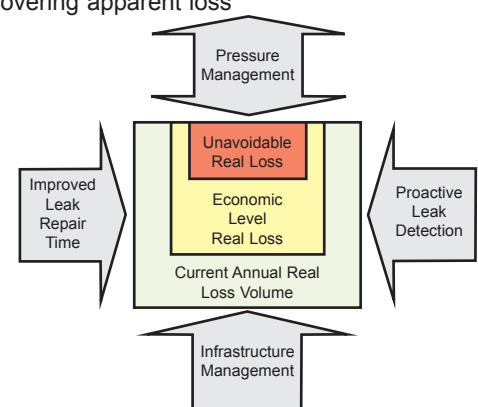


Figure 1 the four key tools used in a proactive real loss management program

The Role of Pressure Management in Real Loss Reduction Programs (continued)

As pressure is reduced the annual volume of loss is reduced bringing the current annual real loss volume closer to the economic annual volume of real losses as is depicted in Figure 2.

The role of pressure management in providing sustainable loss management programs

A well planned pressure management program can reduce volumes of real loss for all real loss components as well as for the theft component of apparent losses.

Not only does pressure management reduce volumes of real losses but it can also reduce the frequency of new leakage therefore addressing in many cases not only the effect of the leaks but also the cause.

Using modern pressure modeling techniques the benefits of a pressure management program can be properly assessed prior to implementation^{2,3,4}.

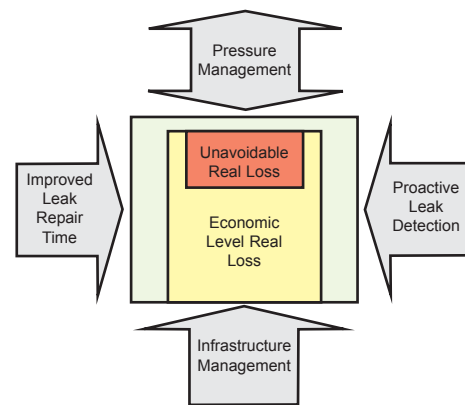


Figure 2: Current annual real losses reduced closer to the target economic level of real losses by pressure reduction

Pilot operated control valves are a cost effective tool for water loss management programs

Pilot operated control valves are likely one of the most cost effective and technically sound options for pressure management programs aimed at reducing real losses. These valves are easily installed and maintained and can be retrofitted to provide advanced flow based or remote based modulation. Key valve functions often used in a pressure management program are^{2,4}:

- Pressure reducing
- Pressure sustaining
- Pressure relief
- Altitude and level control
- Pump start and surge anticipation

About the author

Julian Thornton has undertaken many successful pressure management projects throughout the world and is currently the IWA Water Loss Task Force "Pressure Management Team Leader". He is also the Chair of the National AWWA Water Loss Control Committee "M36 Water Audits and Leak Detection Manual re-write committee" and is the author of the "Water Loss Control Manual" published by McGraw Hill New York June 2002 ISBN 0-07-137434-5. Julian can be contacted on watloss@attglobal.net.

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