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## Water Loss

### IWA TASK FORCE

# A practical approach to water loss reduction

● To introduce a special series of articles to appear in coming issues of *Water21*, **KEN BROTHERS**, chair of the IWA Water Loss Task Force, outlines the important contribution IWA is making in this area.

IWA Water Loss Task Force – part of the Operations and Maintenance Specialist Group - is pleased to present the first in a series of articles entitled "A Practical Approach to Water Loss Reduction". Subsequent issues of *Water21* will contain a series of specific articles relating to world best-practice in water loss assessment, reduction strategies, and a tactical "tool box" of activities emerging as the best practical approach to reduce water losses. These articles will be submitted by the IWA Task Force Team Leaders with the support of their international specialists in each defined area of activity.

The IWA Task Force has expanded its participation and involvement, which now comprises of over 42 members, from 19 countries across five continents. The issue of water loss reduction, sustainability of source and supply, and cost

effectiveness of system operations has emerged as a world-wide issue, particularly in recent years.

IWA has been a leader in developing a standard water balance, international terminology, strategies for water loss reduction, and corresponding performance measurement. Many national standards have been developed using the IWA approach to water loss management and it is clear from the international response that the strategies advocated by the IWA Task Force are garnering world-wide recognition as best "practical approach" to reduce water loss.

The Water Loss Task Force recently hosted a leakage management conference in Cyprus, November 2002 ([www.leakage2002.com](http://www.leakage2002.com)). It became clear that strategies developed by IWA for water loss control are applicable in many different system designs

throughout the world. The strategies are applicable in European and North American systems where high customer demands and fire protection capacities dictate larger main sizes, looping, and higher system design flow capabilities, as well as in other countries that may provide only local domestic water distribution, without fire flow services.

Water utility operations have always been challenged to maintain system infrastructure at an optimum level to convey the treated water from the source of supply, to the customer's tap as efficiently and effectively as possible. With deteriorating infrastructure issues and limits in source of supply, the importance of leakage and water losses in general has become significant in terms of utility operations, source managed sustainability, and cost efficiency from system leakage investments.

What strategies are needed today for a comprehensive water loss control programme? Some utilities only initiate repairs from reported leaks that surface above ground. More progressive utilities have undertaken pressure management, and active leak control programmes to search out unreported leaks and undertake expedient repairs to minimize losses. But how low can water losses be reduced? Can we describe water losses in a standard format? In fact, how low should utilities target water losses, and what goals or benchmarks should be established to describe losses and measure system performance? These are the issues that the IWA Water Loss Task Force has studied over the past number of years, and has subsequently developed tactical approaches to achieve best practices in loss reduction.

Introduction of new leakage measurements, including performance indicators and leakage reduction goals, are becoming widely accepted in utilities throughout the world. The advanced performance

indicator, the Infrastructure Leakage Index (ILI), described as the ratio of real water loss to the system's unavoidable annual real [background] losses, provides a standard of measurement for system leakage that can be used for comparison purposes around the world. Performance indicators like the ILI provide leakage assessment which can now be used to compare international data sets of utilities applying standard methods for water accounting and the results of other strategic initiatives to reduce system leakage.

The IWA Water Loss Task Force is evaluating other system efficiency factors which may include economic level of leakage ratios, and other system pressure optimization factors that will recognize reductions in system pressure and corresponding reductions in non-revenue water. These issues are currently under debate at the IWA Water Loss Task Force and will provide further focused discussion and subsequent articles for industry dialogue, study, and assessment.

The Task Force has advocated four leakage management activities that will be described in subsequent articles. These initiatives include pressure management, active leak control, speed and quality of repairs, and pipeline asset management, maintenance, and renewal.

The extent of a utilities investment in each of these activities must be considered in an overall economic analysis to optimize monetary investment in resources and activities for non-revenue water loss reduction, as compared to the cost of water saved arising from these programmes.

The IWA Water Loss Task Force structured six investigative teams for focused activity in:

- active leak control
- district metered areas
- pressure management and control
- performance indicators and system benchmarking

- real water loss evaluation
- apparent water loss

Each Team on the Task Force has developed a strategic plan and deliverables, described below, which will be presented at the 2004 World Water Congress, in Marrakech, Morocco.

#### **Task Force Team Initiatives:**

**The Leak Detection Team** will focus on methods, techniques, and state of the art technologies for active leak control programmes. The team will review and assess the noise logger technologies and other sounding techniques for the documentation of leak noises on metallic pipe systems, non-metallic pipe correlation technologies, and recommend best-practices in these areas.

**The Pressure Management Team** will focus its activities in the preparation of design criteria for pressure management and pressure management areas. The team will investigate new pressure control equipment, dynamic operation, assess the impact on real and unavoidable loss reductions arising from pressure management, and report results and recommendations for best-practice in pressure control.

**The District Meter Area Team** will undertake a literature review of current practices in district metered area design, information collection, planning, and testing. The team will develop meter selection criteria, night flow analysis, including customer use profiles, estimation data, unavoidable losses, extraordinary use, and real loss calculation through this component analysis and create an IWA District Meter Area Design Manual.

**The Real Water Loss Team** will leverage the existing volume of work already undertaken by the Task Force. The team will focus on component analysis of real losses, including mains, services, connections, and system pressure. The team will study and report the methodology to determine the economic level of

leakage standards that may be applied across a broad spectrum of utilities around the world.

**The Apparent Water Loss Team** will develop, document and disseminate information on apparent water losses. The team will endorse strategies to control apparent water losses and undertake research in each of the appropriate strategies which include meter accuracy error, unauthorized consumption, data error and information transfer, poor accountability, and other "paper losses".

**The Performance Benchmarking Team** will prepare an ILI Calculation Guide including definitions, guidance on system attribute inputs and calculation of confidence levels, infrastructure descriptors and other useful tips to ensure consistency in the calculation of the Infrastructure Leakage Index. The team is responsible to collect and maintain an international data set of utilities participating in ILI performance comparison.

Our Water Loss Task Force welcomes interested specialists to participate on the team of your choice to contribute to the development of best-practices in leakage control and management. We would be pleased to forward your request for participation to one of our Team Leaders as we build a world-wide network of water loss practitioners and utilities applying best water loss practice management and performance measurement using the IWA international approach.

Our next article will feature Allan Lambert, Past-Chair of the Water Loss Task Force, who will outline the practical approach to assessing Non-Revenue Water, Apparent Losses and Real Losses. ●

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