

Water loss management strategies in Italy

● During the forthcoming conference 'Leakage 2006' in Italy in May, leading world experts from the IWA Water Losses task force will be supporting and encouraging the rapidly growing interest in improving water loss management in Italy. **MARCO FANTOZZI** reports on recent developments.

In Italy, non-revenue water (NRW) levels range from 15% to 60% of total system input volumes, the average being 42% (ISTAT 2003). Some European countries – notably the UK and Malta – have fully sectorised distribution networks, with continuous night flow measurements, and frequent interventions to locate unreported leaks. In Italy however, the majority of water utilities only repair 'reported' leaks and do not practice any regular form of active leakage control or pressure management, except perhaps as an emergency response during droughts.

In an effort to stem these losses, Decree 99/97 regarding water balance calculations was issued on 8 January

1997. According to the decree, Italian water utilities are required to calculate the water balance for all their networks and to report on water losses from each network.

Decree 99/97 introduced some important recommendations on pressure and flow measurement. However, it missed the opportunity to give Italian utilities a practical tool for developing a strategy for management of NRW based on a better understanding of the reasons for its occurrence, and the factors that influence its components. In Decree 99/97 water losses, as well as NRW and leakage, are still quoted as a percentage by volume of system input (or water production). This indicator is unreliable for benchmarking the operational management of real losses as it is so

strongly influenced by consumption and changes in consumption.

Over 25 years ago the UK National Water Council (Report 26) identified this problem, as did the German DVGW in 1986. More recently, the American Water Works Association, as well as national organisations in a number of countries and the World Bank Institute, are no longer recommending the use of percentages for this purpose.

Following the publication of the IWA best practice performance indicators (Alegre et al, 2000), it is now recognised that litres per service connection per day, and the infrastructure leakage index (ILI) – the ratio of current annual real losses to unavoidable annual real losses – are the preferred means of comparing leakage management performance in most systems. The large range of connection densities (per km of mains) experienced in Italy makes m^3/km of mains/day unsuitable for this purpose.

'Leakage 2006' – the European conference on water loss management

There is great interest throughout the European water industry in a positive approach to management of NRW, consumption, pressure and leakage. The IWA Water Loss task force methods are now more widely accepted and used. Therefore in May Italy will host Leakage 2006, a series of international workshops and conferences dedicated to water loss management and regulation.

Leakage 2006 is being organised by the Italian Water Loss group (GOA), Fondazione AMGA and the H2O International Water Fair (H2O Fair www.accadueo.com).

Leakage management is so central to the efficient operation of modern water networks that the event has drawn the support of IWA, through the Association's Water Loss task force, of the Specialist Group on Efficient Operations and Management.

This event will be a great opportunity to hear from leading world experts from the UK, Europe, US, Canada and Australia and to hear how the practical approach to water loss management developed by the IWA Water Loss task force can be successfully implemented.

The programme for 'Leakage 2006' includes:

- a one day workshop in Genova on 15 May entitled 'The collaboration of leakage specialists, water utilities and regulators to improve water systems efficiency'
- a three day workshop and conference at the H2O International water fair in Ferrara on 17, 18 and 19 May entitled 'Water loss management strategies'. The Ferrara programme includes:
 - a conference on 18 May entitled 'International experiences in efficient water loss management'
 - an introductory workshop on the IWA Water Loss task force practical approach to water loss management
 - a special session on network modelling and water losses on 19 May
 - three workshops on leakage management, rehabilitation and modelling will also take place as associated events on 17 May, thanks to EC funded projects Tilde and Hydroplan, and to CSSA.

Leakage 2006 will provide a unique opportunity for water industry practitioners interested in following European and global best practices in water loss management and leakage detection to gain a full picture of the latest technical solutions available and to hear directly from other end-users how various applications for leak detection, measurement and management are working in practice.

The full programme is available on line at the event website: www.leakage.it or at the Fondazione AMGA web site www.fondazioneamga.org

Ongoing initiatives in Italy

Minimisation of losses in the network is a key requirement in Italy, as water loss levels are very high for a developed country. In an effort to better manage water losses from water networks, Italian regulators are looking at new legislative measures to require water utilities to report their water losses. With these moves under way, there is an urgent need for water managers to gather information and to use tools to implement such requirements.

Therefore, to promote the application of international best practice and measurements in water loss management, and, more generally, to help improve the management of water losses in the Italian water industry, two organisations have created the Italian Water Loss group (GOA – Gruppo Ottimizzazione Acquedotti). They are: Fondazione AMGA – a member-supported, non-profit organisation that sponsors research to enable water utilities, public

health agencies and other professionals to provide safe and affordable drinking water to consumers; and FederUtility, an organisation representing 400 water and gas utilities that supply water to around 36 million people in Italy. The activities of the group, which already has more than 80 members from the Italian utilities, universities and water institutions, was officially inaugurated on 25 October 2004 in Genova, Italy, during the FederUtility workshop Towards more effective management of water losses in distribution systems.

The Italian Water Loss group is a vehicle for:

- increasing water utility awareness of the importance and economic benefits of improved management of pressure-dependent leakage
- acting as a national centre for promoting International Water Association (IWA) specialist information to the Italian water industry
- disseminating the practical approach developed by the IWA Water Loss task force to a wide number of potential end-users and to obtain their feedback
- communicating available methodologies and innovative techniques for efficient water loss management, allowing end users to make contact with each other and exchange ideas and experiences.

The crucial issue was a general acceptance of the approach. Moving forward, Fondazione AMGA has planned a series of training workshops to further extend the application of the methodology in Italy. So far over 180 technicians from utilities and regulatory bodies from all over Italy have been trained in the practical application of the methodology.

The Italian water industry itself views the IWA methodology in a very positive light. Mr Bazzurro (the Fondazione AMGA Secretary General) says: 'It has got the support of everyone. The important thing is that most advanced utilities are already on board.' On the regulatory side, the Emilia Romagna region has already issued a new guideline on water balance calculation, which introduces several concepts and key performance indicators from the IWA practical approach. The ILI – the performance indicator that measures how effectively real losses are being managed at the current operating pressure – has been paid particular attention.

Many utilities have started using the IWA water balance and key IWA performance indicators, using specialist software developed to take into account the requirements of Italian decree 99/97. This allows export of

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data from the Italian water balance to build the IWA water balance. This software, based on PIFastCalcs, has been made available through the Italian Water Loss group. PIFastCalcs is based on the standard Water Balance methodology and performance indicators recommended by the IWA (References 1, 2, 3).

The performance indicators are calculated and compared with the values from an international data set used in the Aqua December 1999 paper (Reference 1), and an initial European data set. PIFastCalcs is part of the LEAKS (Leakage Evaluation and Assessment Know-How Software) suite of softwares, using best practice methods promoted by IWA Water

Losses task forces. Further information is available at www.studiomarcofantozzi.it or at www.leakssuite.com.

Most Italian utilities do not have an active leakage control (ALC) programme and budget, and are unaware of the extent to which the annual volume of their real (physical) losses could be significantly reduced by limiting the average run times of unreported leaks. After being trained on how night flow measurements can assist in the timing of individual ALC interventions, some Italian utilities have successfully applied a new methodology to predict the economic frequency of ALC intervention for their systems, and to calculate an annual budget for economic ALC (excluding

IWA Water Loss task force (WLTF) – past and future events

The WLTF Italia conference is one of a series of national and international events organised by members of the WLTF with IWA support. The concept began in Cyprus, in 2002, when a group of water loss specialists and practitioners acknowledged the value and the strength of forming a network dedicated to the promotion of water loss management. Conferences and seminars are an ideal way of communicating research and development of water loss strategies and technologies. Frequent events have been held since the Cyprus conference (Malta 2004, Italy 2004, Australia 2005, UK 2005), as well as promoting the work of the WLTF at specialised workshops at each IWA Congress and at the IWA 'Efficient' Specialist Group events (Tenerife 2003, Marrakech 2004, Chile 2005). Following the success of 'Leakage 2005' in Nova Scotia last year, the decision was made to have a biennial international conference in the 'Leakage' series. The next one is 'Leakage 2007', to be held in Romania in September 2007.

Presentation material and highlights from some of these events can be downloaded at www.liemberger.cc and more information on the WLTF can be accessed via www.iwaom.org. Membership of WLTF is via reinhard.mail@gmail.com.

repair costs) and the economic level of unreported real losses (Reference 4).

Italian utilities have also begun to understand that effective management of distribution system pressures is the foundation of any successful and economic policy for leakage management. One example of this is the pressure management scheme in Torino, reported at the October 2004 Genova workshop. In this case, the installation of a well-placed booster station resulted in a 10% reduction in night pressures (and average pressures) over a major part of the city, and has resulted in a sustained reduction of around 50% in annual repair costs, as well as a reduction in real losses.

The presentation of this scheme at the October 2004 workshop, coupled with an explanation of the evolving theories of pressure – burst frequency relationships, and international examples of burst reduction by pressure management – stimulated three other utilities to successfully attempt pressure management schemes. Their work was reported at the April 2005 Genova workshop. As a result of such Italian success stories, supported by the expertise and commitment of the Water Loss task force, and the efforts of

the Italian group, it is hoped that real progress in reducing water losses, which are clearly far too high at present, will be achieved in Italy.

Metering

Good flow metering also helps the utility operator to understand NRW. Metering is common in Italy but, as in most countries, not enough attention is paid by utilities to ensuring that the meters have an acceptable performance over their lifespan. Apart from a few advanced cases, the replacement policy is not actually based on economic aspects and, in general, utilities do not consider that meter performance decreases over time.

You need to have meters to control the key points in the network and to take advantage of domestic meters as they can be relevant in terms of operational control of the system,' says Professor Cascetta of the University of Napoli and a member of the GOA. To encourage utilities, a new code of practice covering controls for all metering instrumentation used for billing, and also replacement policy, is currently in preparation in Italy with the aim of exploiting metering to its full potential for water loss management.

About the author
Marco Fantozzi is the managing director of Marco Fantozzi, a company specialising in water loss management software and in personnel training in the efficient management of water systems. He is a member of the IWA Water Loss task force, and the technical co-ordinator of the Italian Water Loss group, and he is actively promoting the application of IWA methodology.

In conclusion, Professor Mazzola of the University of Palermo and chair of the GOA, speaking of his hopes for the future in Italy of water loss management after 18 months of activities from the Italian Water Loss group, says 'The time to start reducing leakage levels in Italy is now. Italian utilities now have the methods and the tools for achieving this important goal.' ●

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