

# Achieving improved water safety through better operation and maintenance practices

In this article, **Jonathan Parkinson** advocates that the achievement of objectives defined by the water safety planning process is dependent on the introduction of improved operation and maintenance practices. In this context, the Operation and Maintenance Network aims to enhance the effectiveness and sustainability of capital investments in water infrastructure and ensure improved service delivery with benefits for both consumers and the environment.

## Deficiencies in operation and maintenance undermine development objectives

It is a well known fact that improved access to adequate quantities of potable water combined with improved sanitation can reduce the burden from diarrheal diseases dramatically. In response to this need, governments, international financial institutions and donor agencies invest considerable resources towards increasing service coverage and construction of new facilities. But far less attention is paid to the long-term operation and maintenance (O&M) requirements. The deterioration of infrastructure assets due to a lack of O&M represents an enormous financial loss resulting in reduced asset life and premature replacement. Neglecting maintenance also results in increased cost of operating facilities and a waste of related natural and financial resources (1).

A lack of O&M also undermines the achievement of serviceability targets which has a strong influence of achievement of customer service level objectives. This situation invariably reduces willingness to pay which has knock-on consequences on utilities' revenue streams and the available budget for operating and maintaining assets (as illustrated in Figure 1). For example, insufficient O&M funding meant that the municipality of Bulawayo in Zimbabwe could not pay for the pumping needed to keep the project's sewage plant operating. And in Indonesia, a water supply system in Denpasar, Bali, fell into disuse because the municipality could afford to operate the pumps for only a fraction of the time needed each day (2).

Thus, deficiencies in O&M inevitably mean that systems do not operate in the way for which they were designed and consequently the expected level of benefit is not achieved. The resultant poor performance and sometimes complete failure of water supply and sanitation systems due to lack of O&M has significant adverse consequences on the effectiveness of the investment is compromised in terms of level of service to customers and the satisfactory performance of treatment facilities. This has significant implications. A recent evaluation by the World Bank's Independent Evaluation Group concluded that most municipal development projects paid little attention to O&M, leading to negative project results and significantly increasing the risk to development outcomes.

## Links to Water Safety Plans

It is clear that to improve service delivery on a sustainable basis, there is an imperative need to consider in more depth the O&M requirements of water and sanitation

infrastructure. These need to go beyond simply identifying current deficiencies and spending money on rectifying obvious technical problems. It requires a more strategic and concerted approach.

Water Safety Planning is increasingly becoming the accepted norm for water utilities and other smaller water operators as a way of ensuring safe delivery of water as a means of reducing the incidence of water borne diseases. It is important to note that Water Safety Plans are not only concerned about water supply infrastructure. They are also concerned about the operation and maintenance of sanitation facilities and wastewater infrastructure, as these assets are frequently identified to be the cause of contamination of the clean water systems.

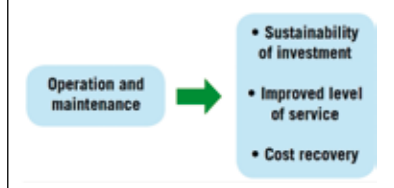
Water Safety Plans involve the development of new (or revision of existing) standard and emergency operating procedures (SOPs and EOPs). The process recognises the importance of institutionalizing good O&M practices, with a particular emphasis on the mitigation of risks through preventive actions combined with simple and consistent monitoring that allow problems to be detected early and for remedial action to be taken immediately.

Once a Water Safety Plan has been completed, a water operator will often need to take steps to address problems – many of which are related to O&M deficiencies. These include technical deficiencies but a diagnosis of these problems often points towards other issues related to the management of the utility. Rectifying these problems may require organizational strengthening and institutional reform that are required to provide the right incentives for improving O&M in addition to technical fixes.

**Figure 1: Vicious cycle of poor service delivery exacerbate by poor O&M**



**Figure 2 : Benefits of operation and maintenance**



### The Operation & Maintenance Network

The Operation and Maintenance Network (OMN) was initially set up at the end of the 1980's by the World Health Organization (WHO) and several partner institutions who recognised that effective O&M is as a key factor towards sustainable water supply and sanitation systems. The OMN addresses the need for improved O&M of water supply and sanitation systems, with particular emphasis on the conditions of low and middle income countries. Under the umbrella of the Water Supply and Sanitation Collaborative Council (WSSCC), the Operation and Maintenance Working Group (OMWG) was established in September 1990. In 2000, coordination of the Network passed from WHO to the National Institute of Public Health (NIPH) in Japan and became financially supported by the Ministry of Health Labour and Welfare. The Operation & Maintenance Network (OMN) is now coordinated by NIPH and supported by IWA and WHO.

The network aims to promote longer term sustainability by addressing chronic

deficiencies that undermine O&M taking into account the broader picture of service delivery. It also aims to address challenges in the sector by sharing the experience and expertise of service providers, external support agencies with experienced practitioners and expert researchers.

It functions as a networking tool and exchange mechanism to share experiences, knowledge and information to improve the O&M of water supply and sanitation systems. Peer to peer interactions are also an effective stimulus to increase demand for knowledge, and transfer experiences and expertise at national, regional and international levels.

### Toolbox on Operation and Maintenance: now live!

The OMN recently launched their online O&M toolbox – to be found at [www.operationandmaintenance.net](http://www.operationandmaintenance.net). The toolbox provides a chance to share additional knowledge and experience through uploading relevant resource material in the form of tools (manuals, guidelines, training material) and case studies. Currently the toolbox comprises 65 tools and 9 case studies drawn from 25 different sub-themes of O&M. These range from community involvement, design, institutional and management aspects to monitoring and operational performance of urban and rural systems.

The OMN is currently actively seeking to expand the amount of tools and case studies available for download. The current priority areas that are targeted are :

- design and operational performance of

sanitation systems

- hydraulic analysis of water production and distribution systems
- pressure management and micro-metering
- management options for rural drinking water and sanitation
- implementation and monitoring of Water Safety Plans.

### O&M advisory service

The OMN also offers a tailored technical advice for eligible sector practitioners via the O&M advisory service. This service aims to link specific technical queries regarding all aspects of O&M to a pool of experts that will provide advisory support. The service will be officially launched in April 2010.

### Regional workshops

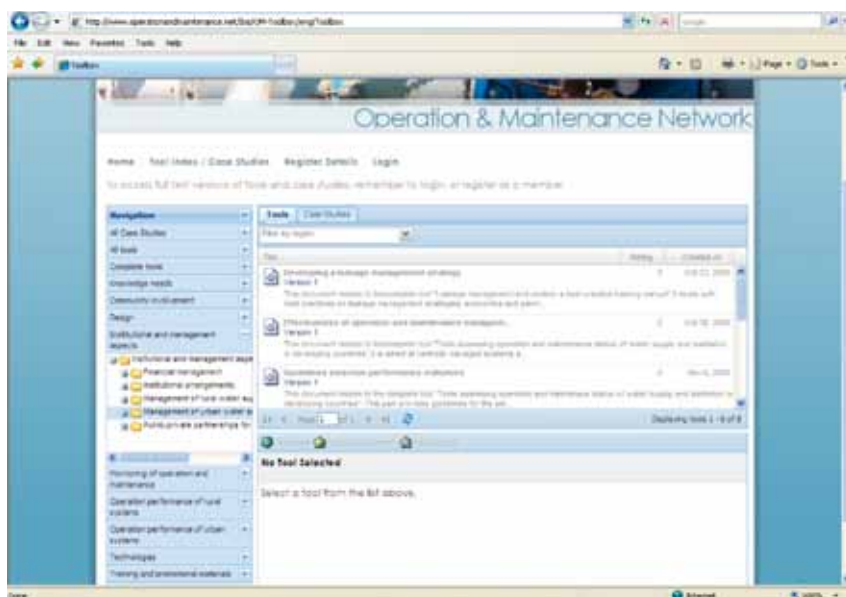
OMN is pleased to announce an inter-country workshop, to be co-convened with the WHO Thematic Working group on Water, Hygiene and Sanitation, which will take place in Laos at the end of May 2010. The workshop aims to encourage participating countries to develop national level O&M frameworks, or to strengthen existing frameworks.

This is the first in a series of regional workshops to be planned for 2010. A second workshop is planned to be held in conjunction with the Latin American-Caribbean Water Safety Plan Network. The third workshop will be in Africa (country to be identified but provisionally scheduled in October).

Furthermore you may find us participating at other conferences and events such as the recent African Water Association in Kampala, the Stockholm Water Symposium and IWA's own congress in Montreal, which are both in September 2010

For further details on OMN and its activities visit [www.operationandmaintenance.net](http://www.operationandmaintenance.net) or contact [omn@iwahq.org](mailto:omn@iwahq.org)

**Figure 3: Screen shot of the OMN portal**



### About the author

**Jonathan Parkinson** ([jonathan.parkinson@iwahq.org](mailto:jonathan.parkinson@iwahq.org)) is part of the Development Solutions team and is IWA's Programme Co-ordinator for the Operation and Maintenance Network.