Pacific Water Demand Management Newsletter
August 2010

Welcome to the third edition of the Pacific Water Demand Management Newsletter – a brief update on demand management and water loss happenings and activities in the Pacific.

Your contributions are most welcome and appreciated – please feel free to share upcoming and past events, activities, highlights, or anything else you see of value to be shared.

Please disseminate widely to your networks.

Quick Quiz!

1. Inaccurate meters, data handling errors, poor quality meters and an inadequate meter replacement policy are all causes of “apparent water losses”. True or False?

2. A water balance calculates non-revenue water into its respective components and helps identify where the main problem areas lie. True or False?

Find the answers at the bottom of the newsletter.

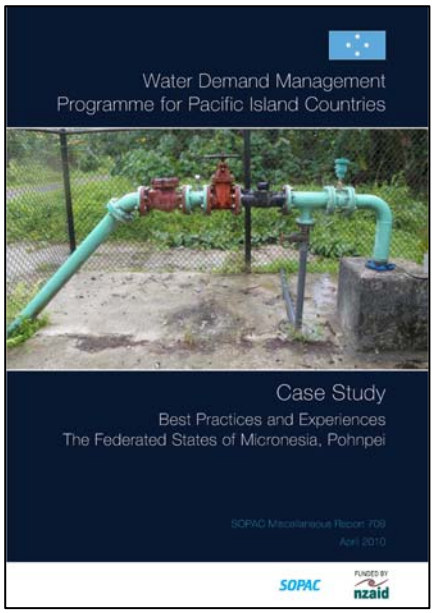
➢ Resource booklet: WDM practices in FSM

The dissemination of knowledge and experiences in Pacific water demand management practices is an important outcome of SOPACs WDM component.

A resource booklet has been developed to document and outline best practices and experiences from Pohnpei Utilities Corporation (PUC), Federated States of Micronesia, in implementing water demand management practices as a case study from the Northern Pacific.

It is intended that other Pacific utility managers and staff can use this case study as an information resource and practical guide for improving water demand practices and reducing water loss in their respective water supply systems.

Contact chelsea@sopac.org to request a copy of the resource booklet or download it from www.pacificwater.org/pages.cfm/water-services/water-demand-management/resources-utilities.html.



➢ Designing an Effective Leak Reduction & Management Program

A valuable and helpful guideline for the key questions and techniques used to "Design a Non-revenue Water Management Strategy" can be seen in the following table.

The process is logical and must begin with understanding how much water is flowing to where in the system. Once losses are quantified and located, reasons for these losses occurring are sought through a review of network operating practices. Techniques and means to improve performance are then developed into an action plan, including strategies to sustainably maintain target levels of non-revenue water.

Table 4: Designing a Nonrevenue Water Management Strategy

Key Questions	Techniques
How much is being lost?	*Water audit:* Measure components, check production or consumption, recalculate Measure components water balance, review records, operating procedures, skills
Where is it happening? Quantify leakage Quantify apparent losses	*Pilot studies:* Quantify total losses, that is, how much the leakage is in the distribution network, transmission mains and reservoirs and how much is non-physical loss; refine the water balance calculation
Why is water being lost?	*Review of network operating practices:* Investigate reasons for loss, that is, old/corroded pipes and fittings, poor practices, poor quality assurance, local influences as well as cultural, financial, social, and political factors
How can performance be improved? Design a strategy and action plan	*Development of an action plan:* Update records systems, introduce zoning/District Metered Areas; monitor water leakage; prioritize areas; address nonphysical losses; detect and locate leaks; initiate repair/rehabilitation policy, hydraulic modeling, develop geographic information systems
How can the strategy be maintained?	*Training/awareness:* Improve awareness and increase motivation; train staff with hands-on experience; monitor the loss management program; implement asset management systems

Source: Adapted from Leakage Management and Control: A Best Practice Training Manual, 2001. WHO.

The full guideline, which includes informative case studies, can be found on the WDM resources page of the Pacific water website: www.pacificwater.org/pages.cfm/water-services/water-demand-management/resources-utilities.html

➢ DRINKING WATER SAFETY & DEMAND MANAGEMENT

Water demand management is an important component of drinking water safety planning (DWSP).

DWSP is a risk assessment and risk management tool that enables a water supplier to identify the risks to the safety and security of the supply and to take the appropriate steps to minimise and manage the risks.

Public health risks, such as the control of harmful bacteria, protozoa, algae and viruses are usually the first concern for water suppliers. Places where pipes leak are points where contaminants can potentially enter the system if water pressure is lost, compromising the safety of water for consumers. Contaminants can also enter the system when pressure is lost and backflow of dirty water from a household connection occurs.

Two water demand management tools – active leak detection and pressure management – help to reduce this risk. In addition, proper procedures and techniques during leak repairs and routine asset maintenance should be observed so that contaminants do not enter the system.

It is also very important to consider the sustainability of a water supply, both financial and in terms of security, or continuity of supply. Where system losses are high, even if a water plant may be operating at full capacity it still may not be able to keep sufficient water available to consumers, and there may be difficulty maintaining pressure and flow at the far ends of distribution zones.

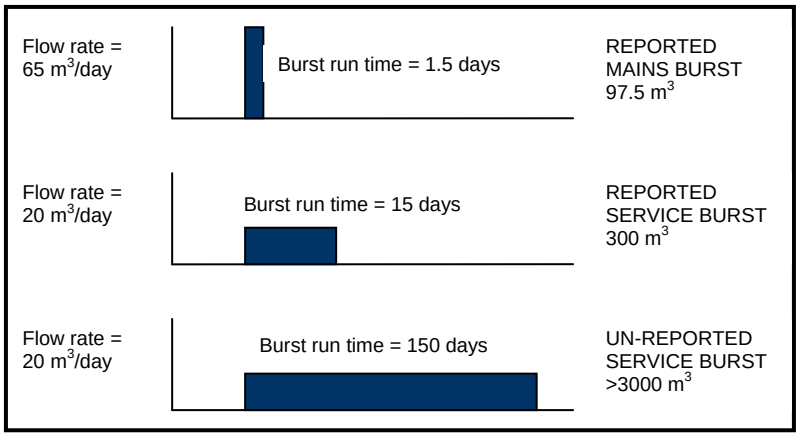
Production of water for human consumption involves considerable expense, in treatment (if applicable) and operational costs, and as such water that has been supplied and lost can be a considerable unnecessary financial burden on a utility. Investment in water demand management incorporated into a drinking water safety plan as part of the maintenance and sustainability programme, can prove financially beneficial over a long term by reducing costly loss of water.

➢ LEAKAGE MANAGEMENT STRATEGIES

There are three different groups of leakage management strategies:

- passive control,
- regular survey (sounding, loss metering),
- leakage monitoring in zones.

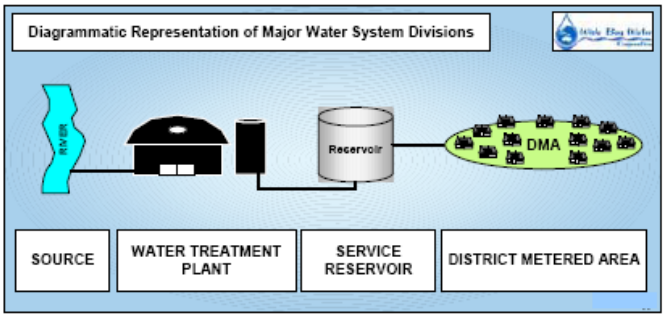
A passive control strategy is the utility reacting to a visible leak when reported by a customer or identified by staff. Making sure all visible leaks are repaired is often the first step to improvement.

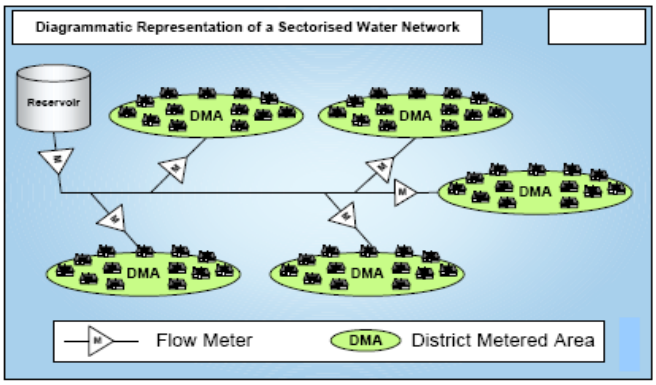


A regular survey of the distribution system is done by either sounding or loss metering. Sounding is when the system is inspected from one end to the other by listening for leaks on pipework and fittings. High night flows (approximately equal to losses) can be identified by reading metered flows into temporarily zoned areas of the system.

By sectorising the supply system into District Metered Areas (DMAs) and monitoring the flows, leakage can be monitored and quantified in each district or zone. Leak detection activities can then be prioritised. This strategy is widely practiced and cost-effective A DMA is a zone of the distribution system which has a distinct and permanent boundary. Pressure can also be managed at a DMA level through installation of pressure-reducing valves.

Download the "Leakage management and control: A best practice training manual" by Malcolm Farley for more information:
www.who.int/water_sanitation_health/hygiene/om/leakage/en/index.html





➢ PWWA, PIAC & SOPAC potential benchmarking partnership

SOPAC, as allied members, attended the Pacific Water and Wastes Association (PWWA) workshop on benchmarking and matchmaking on the 6th and 7th of July 2010. The workshop was co-facilitated and co-funded by PWWA and UN-HABITAT.

During this workshop, representatives from the Pacific Infrastructure Advisory Center (PIAC), PWWA and SOPAC took the opportunity to discuss a potential partnership in benchmarking for Pacific water utilities. The main objective is to improve performance of water utilities (learning from one another and from improved information). PWWA has already initiated benchmarking with its members – 6 key performance indicators will be collected on a quarterly basis from their members.

It has been recognized that in addition to the above regular benchmarking it would be very useful to collect on an annual basis more detailed operational, technical and financial indicators that would allow a more in-depth analysis and comparison of performance. Further discussions to progress the partnership are underway.

➢ WDM Activities Update: Niue & FSM

- Through improvements in system metering, consumer awareness and education programs and active leak detection and repair programs, Niue has clearly demonstrated the benefits of water demand management. In 2007, Niue's water system losses were estimated to be 92 megalitres, or approximately 34% of total water supplied. In 2010, losses were estimated to have reduced to 62 megalitres, or 24% of total water supplied[1]. The Niue Water Division has also reduced their average monthly electricity expenditure - from January to April 2010 the monthly electricity expenditure showed a reduction in the range of 13% to 23%.

[1] Note: These are draft figures and yet to be finalised or endorsed.

- Pohnpei Utilities Corporation in FSM, through improved knowledge, better system metering, pressure management and active leak detection and repair, have been able to continue to maintain their relatively low non-revenue water rate to between 20 – 28% of total water supplied. Support was provided through SOPACs WDM component to replace critical bulk flow meters at the Pohnpei water treatment plant, and for a portable household meter calibration unit, to enable PUC to continue reducing system losses and improving efficiency of system management.

➢ NEW ON THE MARKET

Improvements in leak detection equipment: Gutermann has recently announced the arrival of their latest acoustic sounding equipment for leak detection – the AquaScope 500 (Low Frequency Leak Detector).

The AquaScope 500 features 'frequency multiplication' which enhances an inaudible low frequency to a higher frequency which can be heard. The new equipment is very effective at finding leaks on PVC, u-PVC and low pressure pipes.

For more information on Gutermann products contact Andrew Clark, andrewc@gutermann.net.au.

For further information or to contribute to the next newsletter, please contact:
Chelsea Giles-Hansen
Water Demand Management Officer
SOPAC
chelsea@sopac.org
+ 679 338 1377 ext 273

Quiz Answers

1. True. Non-revenue water (NRW) includes apparent losses due to metering inaccuracies (under-registration of meters, poor quality inaccurate meters, data handling errors etc), and unauthorised consumption (illegal connections). Other components of NRW are real losses (leaks on mains, leaks on service tanks, leaks on service connections) and unbilled authorised consumption.

2. True. A water balance (or system audit) enables water suppliers to understand the magnitude of their water loss problem, to identify areas which require prioritised attention and to plan and undertake technical and commercial measures to reduce and keep NRW under control. For example, a water balance/audit may indicate huge water losses in a main trunk line, or can indicate that maximum leakages are occurring at the point of service connections – the measures to resolve these issues will be very different.

For more information see:
www.pacificwater.org/_resources/article/files/IWA%20Standard%20Water%20Balance_Water%20Loss%20Task%20Force%20Article%202.pdf

SOPAC