MAKING NRW REDUCTION STRATEGIES WORK IN MALAYSIA

Striving together towards a common goal

by

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27 MARCH 2012
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INTRODUCTION

• Non Revenue Water (NRW) is a matter of grave concern for any country and reducing NRW has become a pressing issue in Malaysia

• Past efforts to improve the situation have been limited due, in part, to underestimating the technical difficulties and complexity of NRW management

• Through the regulatory framework under SPAN, NRW will be given top priority attention to move the NRW plans forward and make NRW reduction programme work

• A special Task Force had been set to recommend an implementation strategy to drive the process for NRW reduction in Malaysia
NRW MANAGEMENT IN MALAYSIA – THE KEY ROLE PLAYERS

- **Policy**
- **Budget allocation**

- **Funding**
- **Oversee project implementation**

- **Regulate NRW Management and Performance of Water**
- **Plan, Design & Supervision of NRW Works**
- **Implement NRW Works / Projects**

- **Consultant**
  - Planning, Design & Supervision of NRW Works

- **KeTTHA**

- **SPAN**
  - Regulate NRW Management and Performance of Water

- **JBA/PAAB**
  - Funding
  - Oversee project implementation

- **Water Operator**
  - Operation & Maintenance of Distribution System
  - Management of NRW Reduction Program

- **Contractor**
  - Implement NRW Works / Projects

- **Stakeholders**
NRW has been included as one of technical aspect to be regulated by SPAN since January 2008.

It is one of the KPI imposed on all water distribution operators.

Auditing are carried out by SPAN to monitor progress and performance.

All operators are required to submit NRW quarterly report to SPAN.

NRW performance are being monitored at the quarterly regulatory meeting with each operator.
## NRW STATUS (2008 – 2011)

<table>
<thead>
<tr>
<th>STATES</th>
<th>2008</th>
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<td><strong>Average for all states</strong></td>
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<td><strong>Average for Peninsular Malaysia and Labuan</strong></td>
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Note: *2011 Data is still under review and verification by SPAN*
CAUSES OF HIGH NRW IN MALAYSIA

- High level of physical losses
  - no active leakage control in some States
- Considerable commercial losses
  - metering inaccuracies / illegal connections
- Aging and deteriorated pipe distribution system
  - 32% or 41,874km are of AC Pipes
- Inadequate operations and poor maintenance
- No systematic asset management
- Lack of holistic planning and implementation of NRW programmes
- Poor implementation of works
- Weak asset management, if any
- Very limited investment in system
- Lack of reliable data
<table>
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<tr>
<th>STATES</th>
<th>NRW % 2009</th>
<th>NRW % 2010</th>
<th>SPAN’S ASSESSMENT ON HOLISTIC NRW MANAGEMENT</th>
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</tbody>
</table>

* TO BE SUSTAINED
* NEEDS ATTENTION
* NEEDS IMMEDIATE ACTION
DEVELOPMENT OF NRW REDUCTION STRATEGIES

1) SPAN organised a NRW National Workshop on 13 – 14 December 2011 on theme: “Accelerating NRW Solution And Implementation In Malaysia” with all water operators and other key stakeholders to seek to present a way forward for addressing the NRW problem in Malaysia.

2) The participants provided the following feedback on issues for SPAN and KeTTHA to follow up:

- Addressing Policy Issues
- Addressing Funding Issues
- Addressing Implementation Issues and Strategies
- Addressing Awareness Issues
- Addressing Capacity Building and Training Issues

3) A Special Task Force was formed at SPAN level to provide input towards an NRW Action Plan to be recommended for implementation in the short and long term nationwide.
DEVELOPMENT OF NRW REDUCTION STRATEGIES

- NRW Policy Framework to guide and support NRW reduction plan
- Implementation Strategies to accelerate NRW reduction program in a planned, coordinated and holistic approach
- A Comprehensive Outline Action Plan for short and long term to back up basic policy and strategy framework
- A Special Task Force to be established to provide expert advise and follow-up monitoring of NRW implementation issues

New NRW Initiatives based on the workshop findings
To achieve a NRW target level of 25% nationwide by 2020 through the following Policy Framework:

1. To be addressed in a holistic approach;
2. “Preventive Action” and not “Reactive” currently;
3. Sustainable and affordable Financing and Funding;
4. Clear Mechanism to effectively monitor NRW programmes;
5. Dedicated structure at State Level to implement NRW program;
6. Capacity building and competency requirement;
7. Research, Development and Innovation in NRW management;
8. Enhanced Consumer education and awareness towards NRW management and role of stakeholders.
**NRW IMPLEMENTATION STRATEGIES**

**Policy 1**
To be addressed in a holistic approach

**Strategies**
- To establish standard NRW definitions and indicators for application to all operators
- To raise awareness and understanding on the concept of “holistic” NRW program
- To implement NRW program in a holistic manner
- To introduce use of Infrastructure Leakage Index (ILI) and promote use of Economic Network Efficiency (ENE) in the future

**Policy 2**
Based on “Preventive Action” and not “Reactive” currently

**Strategies**
- Ensure only standard product approved by SPAN are used
- Ensure work quality by contractors and plumbers
- Ensure design and work supervision by Consultants follow specifications and best practise
- Regulate handing over of water system that are developed by third parties
NRW IMPLEMENTATION STRATEGIES

**Policy 3**
Sustainable and affordable Financing and Funding

**Strategies**
- Leverage on PAAB to fund and procure NRW works for migrated states under asset light model
- To recommend funding options in the interim period for non migrated states
- To introduce outsourcing options such as “performance based contract” for NRW works

**Policy 4**
Clear Mechanism to effectively monitor NRW programmes

**Strategies**
- Regulate closely NRW as KPI through auditing and regulatory meetings
- To monitor and discuss NRW performance and implementation issues through special Task Force
- To benchmark operator performance and give attention to low performing operators
NRW IMPLEMENTATION STRATEGIES

Policy 5
Dedicated structure at State to implement NRW program

Policy 6
Capacity building and competency requirement

Strategies
- To restructure state Water Supply under WSIA and leverage on PAAB’s funding
- To establish NRW Active Leakage Control Team in each State
- To establish Support Unit in each State Water Organisation to focus on
  - GIS, Network Modelling, SCADA
  - Billing System
  - Customer Service
  - Materials Control

Strategies
- To build competent and skilled staff in NRW management
- To establish competency scheme in accordance to Section 49 WSIA
- To develop standard operating guidelines for leakage control management for operators
NRW IMPLEMENTATION STRATEGIES

**Policy 7**
Research, Development and Innovation in NRW management

**Strategies**
- To establish NRW pilot project in selected location for evaluation and reference
- To present NRW levels of major towns in Malaysia for comparison of NRW at international level
- Cooperate with other organisations (MWA, Forum Air, AWER) and institutions of higher learning to raise understanding and awareness of NRW activities

**Policy 8**
Enhanced Consumer education and awareness towards NRW management and role of stakeholders

**Strategies**
- To involve NGO’s and mass media in awareness and educational program on NRW issues:
  - Forum Air
  - AWER
  - Media
- To develop and implement Communication Plan and Consumer Awareness on NRW issues
In framing out the NRW Implementation Priorities under the Active Plan, consideration are given to balance the benefits that derive from:

- Short term project Vs long standing process
- Quick wins Vs slow wins
- Impact Vs Output

We shall discuss four examples of short term Priority Action Plans proposed to be implemented in a coordinated manner for the first 3 years.
**ACTION PLAN**: Framing the Priorities (3 Years)

Initial proposal is for all water distribution operators to attend to the physical and commercial losses in the Water Balance.

**PHYSICAL LOSSES**
- Bursts, Leaks

**COMMERCIAL LOSSES**
- Un-metered Public Use
- Illegal Connections
- Meter Error
- Unbilled

**Revenue Water**

**Malaysia Average**:
- 63% - Billed
- 36% - NRW

This layout is fully consistent with the IWA water balance.
PRIORITY ACTION PLAN 1:
OPEARTORS SHOULD IMMEDIATELY ACT ON THE APPARENT (COMMERCIAL) LOSSES FOR QUICK GAIN

Eg: SAINS & SADA had quick gains from reducing commercial losses

Reduction of meter error by
- Testing, Sizing, Replacement

Reduction of theft by
- Education, Legal action, Prepay measures, Pressure limitation, Flow control

Reduction of human error by
- Training, Standardizing, Reporting, Auditing

Reduction of computer error by
- Auditing, Checking, Routine analysis, Upgrade

As each component receives more or less attention, the losses will increase decrease.
Operator strive to keep losses to a minimum

Example
- Carrying out investigations to detect and disconnect illegal connections
- Offering incentives/rewards to informers of illegal users
- Establishing amnesty programmes to attract back illegal consumers
- Regular report checks on large customers and construction sites
- Spot checks and auditing of meter readings and rotation of meter readers (every 6 months)
- Identifying and replacing old and worn out consumer meters with new ones (an ongoing exercise based on the meter age database)
- Prompt updating pf customer database
- Effective disconnection for non-payment
- Right sizing of meters

Source: Thornton (2002)
PRIORITY ACTION PLAN 2: OPERATORS SHOULD IMMEDIATELY ACT ON THE ACTIVE REAL LOSSES FOR QUICK GAINS

Example
- 24hr (standby) leak management unit
- In house and external training of staff on effective leak detection, repair and monitoring
- Routine programme for finding and locating non-visible leaks – *mainly done at night*
- Encourage the public to vigorously report water leaks and bursts – *with a reward for each case reported*
- Repairing identified leaks in < 6 hours
- Computerising the leak reporting register for easy tracking and monitoring
- Pressure management by installing pressure reducing valves
- Routine inspection and servicing of valves and fire hydrants
- Monitoring leak ‘clusters’ to help planning for mains replacement

As each component receives more or less attention, the losses will increase decrease

*Source: Thornton (2002)*
SPAN to establish pilot project in selected districts for purpose of showcase, assessment of full budget requirement, evaluation of effectiveness and improvement.

PRIORITIE ACTION PLAN 3:
OPERATOR TO CONTINUE IMPLEMENT AND MAINTAIN THE NRW HOLISTIC APPROACH FOR SUSTAINABLE LONG TERM

Adoption of standard IWA Water Balance
Establishment of District Metering Areas (DMA) to facilitate Active Leakage Control (ALC)
Pressure Management
Pipeline and Asset Management involving the selections, rehabilitation and replacement of pipelines
Meter reading accuracy, meter management and meter replacement
Speedy and quality pipe burst repairs
Maintenance of DMAs

To be supported by:
- Reliable data collection and management
- Customer service and complaint management
- Capacity Building
ACTION PLAN 4: OUTSOURCING OPTIONS – PERFORMANCE BASED CONTRACTS

An all inclusive contract with contract payments directly related to target achievement and allocates risk appropriately between the parties

Necessary as project management resources and skill not available inhouse

Short term investment for long term revenue increase

Accelerated implementation programme

Provide expert help immediately

Short term mechanism to “jump-start” NRW reduction and break vicious cycle

PBC is just one mechanism that can be applied for example to:
- Overall holistic NRW for short term
- Meter management / maintenance

SPAN to revisit existing PBC Agreements to come up with Model Form of Agreement
NRW reduction is a complex problem which needed aggressive and innovative approach;

It is a continuing program, not an adhoc function;

More structural and operational changes are required incorporating the best practices for a sustainable NRW management in Malaysia;

SPAN, with the support and commitment of all water distribution operators had made concerted efforts to present a way forward for dealing with NRW and the challenge ahead remains for the operators to implement the plans and take the program further to achieve our goals.

Successful water loss reduction can also be transformative, catalyzing an upward spiral of improvements within a water utility.
THANK YOU

If we want our children to have the best in life... if we want future generations to have enough water... let’s start by not wasting the water we have today. Because every drop used, is a drop less for tomorrow.

Every drop used is a drop taken from our children.