The 2008 International Asset Management Process Benchmarking Project

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Project Overview
Forty two water sector utilities participated in this project from Australia, Canada, Hong Kong, New Zealand, Sultanate of Oman, United Arab Emirates and the United States of America, providing a unique and, unprecedented, opportunity for international asset management process comparison and learning.

The Project
The Water Services Association of Australia Inc (WSAA) initiated this 2008 project as part of its ongoing benchmarking program in the water sector. This rolling program commenced in 2000 with the intention to demonstrate to stakeholders that WSAA members are seeking to achieve international best practice in the delivery of services to their customers. The program has since encompassed benchmarking of Civil Maintenance, Mechanical-Electrical Maintenance, Customer Services, Shared Services and Asset Management.

The 2008 project was co-sponsored by the International Water Association (IWA), and delivered through a consultant consortium led by GHD Pty Ltd and including Marchment Hill Consulting and CH2M-Hill.

The project purpose was to raise the level of asset management practice in the global water industry through identifying process improvements and leading practices that can be shared across the industry.

The process assessment used the Aquamark Asset Management Framework and software tool, developed by WSAA in 2003 specifically to provide a consistent and repeatable web-based asset management process benchmarking model.

The Aquamark Asset Management Framework is based around seven core functions covering the asset lifecycle from its conception (planning) to ultimate replacement, fitted within an organisational context of corporate goals/policy and business support systems, as depicted in Figure 1 below. The core functions are further subdivided into process, sub-processes and measures to enable detailed assessment.

Figure 1 - The Aquamark Asset Management Framework

1. Corporate Policy and Business Planning
2. Asset Capability Planning
3. Asset Acquisition
4. Asset Operation
5. Asset Maintenance
6. Asset Replacement / Rehabilitation
7. Business Support Systems

Consultants from the consortium prepared all project reports, at an overall industry level and for each utility, following the independent review of all utility benchmarking self-assessments, analysis and onsite interviews.

Leading practices were identified across the whole participant group, that were showcased at a 3-day Best Practices Conference in Sydney, Australia in October 2008, attended by around 150 representatives of the participating utilities.
The Participants

The 42 participants shown in Table 1 were a diverse group of water utilities, ranging in size from the smallest serving some 4000 people and industry, to the largest serving some 6.9 million people. The total asset replacement costs managed by the utilities in the participant group amount to some USD 48 billion.

Table 1  Benchmarking Participants by Region

<table>
<thead>
<tr>
<th>Australia</th>
<th>New Zealand</th>
<th>North America</th>
<th>Middle East / Hong Kong</th>
</tr>
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<tbody>
<tr>
<td>Barwon Water</td>
<td>Christchurch City Council</td>
<td>USA</td>
<td>HONG KONG</td>
</tr>
<tr>
<td>Brisbane City Council- Water Distribution</td>
<td>Dunedin City Council</td>
<td>Anchorage Water and Wastewater Utility</td>
<td>Hong Kong Water Supplies Department</td>
</tr>
<tr>
<td>Central Highlands Water</td>
<td>Manukau Water</td>
<td>Metropolitan Sewer District of Greater Cincinnati</td>
<td>UNITED ARAB EMIRATES</td>
</tr>
<tr>
<td>City West Water</td>
<td>Metrowater Ltd</td>
<td>City of Portland Environmental Services Bureau</td>
<td>Abu Dhabi Distribution Utility</td>
</tr>
<tr>
<td>Coliban Water</td>
<td>North Shore City Council</td>
<td>City of Portland Water Bureau</td>
<td>Abu Dhabi Sewerage Services Utility</td>
</tr>
<tr>
<td>Wannon Water</td>
<td>Watercare Services Limited</td>
<td>City of Tacoma Environmental Services</td>
<td>SULTANATE OF OMAN</td>
</tr>
<tr>
<td>Water Corporation of Western Australia</td>
<td></td>
<td>City of Tacoma Water Services</td>
<td>Oman Waste Water Services Utility</td>
</tr>
<tr>
<td>Gladstone Area Water Board</td>
<td></td>
<td>Los Angeles Department of Water and Power - Water</td>
<td></td>
</tr>
<tr>
<td>Gold Coast Water</td>
<td></td>
<td>Philadelphia Water Department</td>
<td></td>
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<tr>
<td>Goulburn Valley Water</td>
<td></td>
<td>Seattle Public Utilities – Water and Wastewater</td>
<td></td>
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<tr>
<td>Hobart Water</td>
<td></td>
<td>Tohopekaliga Water Authority</td>
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<tr>
<td>Hunter Water Corporation</td>
<td></td>
<td>CANADA</td>
<td></td>
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<tr>
<td>Melbourne Water Corporation</td>
<td></td>
<td>City of Toronto</td>
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<tr>
<td>SEQ Water</td>
<td></td>
<td>The Regional Municipality of Peel</td>
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<tr>
<td>South Australia Water Corporation</td>
<td></td>
<td>The Regional Municipality of York</td>
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<tr>
<td>South East Water</td>
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<tr>
<td>Sydney Catchment Authority</td>
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<td></td>
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<tr>
<td>Sydney Water Corporation</td>
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</tbody>
</table>

The participant group included water-only, wastewater-only and combined service utilities; wholesale, retail and vertically integrated utilities; utilities owned by National, State and local government; corporatised and non-corporatised utilities; and utilities under various levels of external regulatory and legislative control. This diversity enabled some interesting comparison of process development.
Environmental Forces Facing the Water Sector

The water sector faces one of the most – if not the most – challenging strategic outlooks in its history. Numerous global trends are placing pressures on the water sector, and in turn asset management and other business processes. These inter-related trends include:

- Responses to global warming / climate change
- Significant asset development and growth
- Skills shortages arising from a variety of different factors
- Changes and competing demands from other industries
- New technologies enabling data collection and analysis on a previous unprecedented scale
- Increasing levels of stakeholder involvement and engagement in decision making
- Increasing complexity in customer needs and relationships
- Regulatory scrutiny and Control
- Access to capital for investment.

These aspects of the strategic context for water utilities are driving changes to the way water utilities are being managed.

Participant Group Business Drivers

To identify those environmental forces relevant to the participant group, an analysis of utility “business drivers for change over the next four years” was undertaken as part of this project. Each participant selected their highest priority business drivers from a set of pre-defined business drivers.

Participants were grouped into four regions. Table 2 shows a summary of Priority Business Drivers by Region. These business drivers show strong alignment with the global environmental forces summarised above.

Table 2 Priority Business Drivers by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Priority 1</th>
<th>Priority 2</th>
<th>Priority 3</th>
<th>Priority 4</th>
<th>Priority 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Sustainability</td>
<td>Staff Skills - Experience</td>
<td>Asset Replacement</td>
<td>Asset Acquisition</td>
<td>Knowledge of Assets</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Staff Skills - Experience</td>
<td>Demand Growth</td>
<td>Asset Acquisition</td>
<td>Continuous Improvement</td>
<td>Knowledge of Assets</td>
</tr>
<tr>
<td>North America</td>
<td>Regulation Operational Compliance</td>
<td>Asset Replacement</td>
<td>Asset Acquisition</td>
<td>Funding Limitations / Willingness to Pay</td>
<td>Staff Skills - Experience</td>
</tr>
<tr>
<td>Middle East / Hong Kong</td>
<td>Asset Acquisition</td>
<td>Demand Growth</td>
<td>Staff Skills - Experience</td>
<td>Asset Replacement</td>
<td>Operational Efficiency</td>
</tr>
</tbody>
</table>

The business drivers for change occurring most commonly across regions are shown in separate colours. Of the 23 business drivers analysed across all participants, two were common to all four regions:

- Asset Acquisition and Capital Delivery
- Staff Skills – Experience and Retention

These business drivers are closely aligned. The availability of skilled resources, both professional and technical, is a global issue occurring through demographic changes and competing demands for resources. The water industry as a whole, including the consulting and contracting sectors, is short of skilled resources. Water utility capital programs are increasing due to urbanisation, water resource limitations and increased service expectations. The resource shortage impacts significantly on planning and delivery of capital programs by utilities.
Asset Replacement, Demand Growth and Knowledge of Assets also rate highly in more than one region. These are due to common factors of urbanisation and the aging of asset bases that were substantially established post-World War 2.

In addition, the priority of Sustainability is a clear driver in Australia as a result of a combination of a prolonged dry period, Government policy, and a desire for better corporate citizenship amongst water utilities.

North America is experiencing a parallel driver of Regulation of Operational Compliance, with utilities being increasingly under scrutiny at both Federal and State level.

This commonality of business driver points to the potential for the industry to work cooperatively on an international scale, addressing issues of collective importance.

**High Level Benchmarking Results**

There are a range of high level observations that are apparent. Some of these are open to individual interpretation, and the interactions between analyses of findings are complex and sometimes difficult to detect. Even with 42 participating utilities, the peer group sizes can be small and apparent trends may not be reliable. The overall results are provided in Figure 2 at a function level.

Some of the key interpretations included:

- The median result at the ‘Function’ level across all participants were similar, with a range of only some 7% in Aquamark scores (from ~ 55% to 62%). On one hand, this was not surprising as one might expect reduced differentiation from the diverse population of participating utilities (diverse in terms of region, size, form of regulation, business function, etc). On the other hand, the consistent medians showed an unexpectedly close balance in development of processes across all functions, including the Corporate Policy and Business Planning function where lower scores were historically expected from the participant base.

- The higher median results were in the functions of Asset Capability Forward Planning, Asset Acquisition, Asset Operations and Asset Maintenance. At a process level, these included Asset Financial Management, Demand Planning, Asset Acquisition and Operational Monitoring and Control. These are functions and processes that are typical of engineering and operationally-based utilities which have a focus on customer service and providing safe and reliable services. The water industry generally has a long and mature history in these functions.
The lower median scores were in the more strategic and analytical functions of Corporate Policy and Business Planning and Asset Replacement and Rehabilitation. At a process level, these included Review and Improvement processes, Quality Management and Configuration Management Systems, and the more “strategic” asset management processes of Business Based Maintenance Strategy, Operational Strategy Development, Triple Bottom Line Management, End of Economic Life Identification and Level of Service and Stakeholder Interface Management. This pointed to a need to develop strategic and analytical processes in many water utilities.

The wide spread of results in all functions indicated divergent levels of maturity in asset management processes across the participant group. The analysis revealed 5 general categories of utility with respect to their stage of asset management process development or maturity – Formative (at the lower end), Developing, Established, Mature and Advanced (at the upper end).

There is a clear evolution in asset management processes, from formative utilities with less developed strategic and corporate planning processes, to advanced utilities with balanced process scores across all functions.

Regional Comparisons

The median aggregate scores for each region are shown comparatively in Figure 3 below.

Figure 3 Regional Comparison (Median aggregate scores)

Australia and New Zealand scored at a “mature” level of asset management practice, with Middle East / Hong Kong and North America characterised by “developing” and “established” levels of practice.

Analysis at a regional level drew the following insights:

- Australia and New Zealand regions generally scored similarly and at a “mature” level of asset management, reflecting development of asset management practice over the past 20 years. Australia had a more consistent profile across all functions, while for New Zealand, Asset Operations and Asset Maintenance functions were noticeably higher.

- By comparison, the Middle East / Hong Kong and North America scored generally lower, with both regions characterised by “developing” to “established” asset management practices. Higher scores were generally achieved in the tactical and operations/maintenance areas. The relative scores across functions aligned with the priority business drivers of demand growth and operational compliance for Middle East / Hong Kong and North America respectively.
Australian utilities established higher scores in key corporate and asset decision support areas (e.g. Quality Management, Triple Bottom Line Management, Life Cycle “Best Value” Decision Making and Risk Management). Generally in Australia a more highly economically regulated operating environment, established in some cases over a decade, and the corporatisation of many of the major utilities contributed to a higher level of corporate and strategic planning, and development of advanced decision tools and systems.

In New Zealand, a long-term national focus on asset management, and consequently legislated requirements for asset management planning and customer involvement, achieved the same ends for predominantly municipal-based water utilities. The leading scores for New Zealand were in the Asset Financial Management, Level of Service and Stakeholder / Regulatory Interface Management, People, Asset Management Strategic Plan and Configuration Management Systems. New Zealand utilities had significantly lower scores for Quality Management than in Australia, due to a lower focus on accredited Quality Management Systems. In the Asset Operations function, New Zealand scored highest in Work Practices and Work Control and execution, and also for Work Practices in Asset Maintenance.

In the Middle East and Hong Kong, State-owned corporations under State-driven operating rules or agreements, had generally mature processes for forward planning, and established processes for asset acquisition, operations and maintenance. This region scored highest in the areas of Business Objective Knowledge, and Demand Projection for Asset Capability Forward Planning. There were lower results in corporate and strategic planning and replacement and rehabilitation. In the Middle East, this was considered to be due to the relatively recent formation of these utilities and hence the recent introduction of strategic asset management concepts and process development and documentation.

In North America, characterised by municipal-based utilities under different levels of National and State-based operational performance regulation, the results were similar to the Middle East / Hong Kong with generally established processes for forward planning, asset acquisition, operations and maintenance. There were lower results in corporate and strategic planning and replacement and rehabilitation.

Note that overall regional results were not a reliable guide to the results for any individual utility.

Comparison by Utility Characteristics

The participant group was analysed for the influence of a range of characteristics on the level of asset management practice (measured by Aquamark). The analysis found:

- **Comparison by Utility Size:** Larger utilities generally had higher scores than medium or smaller utilities for Asset Capability Forward Planning, Asset Acquisition and Asset Replacement and Rehabilitation, indicating some economies of scale or larger resource bases in these functions. The differences for other functions were less or insignificant. This may be interpreted as indicating that there are economies of scale and larger resource bases for larger utilities in some processes, and that medium and smaller utilities may be swifter in implementation of strategic planning, maintenance and systems improvements. In summary, there is some positive relationship between utility size and Aquamark outcomes, but whether this link is causal cannot be conclusively established, due to sample size.

- **Comparison by Utility Function:** Integrated (wholesale and retail) utilities, and wholesalers, had higher scores for Corporate Policy and Business Planning and Asset Capability Forward Planning, while retailers had higher scores for Asset Capability Forward Planning, Asset Operations and Asset Maintenance. These results reflected a generally more strategic focus for wholesalers managing large, critical assets, compared to retailers which have a greater focus on customer outcomes through network operations and maintenance.

- **Comparison by Utility Service:** Combined water and wastewater utilities scored significantly higher than either water-only, or to a greater degree, wastewater-only utilities. However, when disaggregating these results by region and function, regional differences appeared to be more significant than service scope differences.

- **Comparison by Organisation Type and Ownership:** Comparison by organisation type (internal department vs corporation), and ownership (State-owned vs local government-owned) provide similar results. Corporations and State-owned utilities (usually both) had significantly higher (15% to 20%) median scores in all functions compared to their internal department and local government-owned (usually both) counterparts. This result is moderated by the regional results, where Australian utilities are predominantly State-owned corporations (13 out of 18) with generally higher scores than the median.
Comparison by Level of Regulation: Utilities that were extensively economically regulated (external regulator for both price and performance) had significantly higher median scores (around 20%) than partially regulated (performance-only or legislated) utilities. As with comparison by ownership or organisation, the extensively regulated group is dominated by Australia. It appears then, that both higher levels of regulation, and/or legislative controls, go hand in hand with maturity in asset management process development.

Overall, the most significant finding is that the maturity or length of time involved in developing asset management is a stronger determinant of the level of asset management practice than ownership, level of economic regulation or organisational structure. This is characterised by both Australia and New Zealand being at a similar level of practice despite generally different regulatory regimes and ownership arrangements (Australia being largely State-owned Corporations under independent regulators – with some exceptions, and New Zealand predominantly Local Government-owned utilities under legislative controls).

The level of maturity was initiated through taking a business-like approach to water management (by utilities as well as Government), driving efficiency through funding limitations and increased customer expectations. The opportunity exists for utilities in other regions to draw from the learnings in developing this maturity, and significantly enhance and accelerate the development of AM practice.

Leading Practice Themes

Seven leading practice themes were developed through a process of collation and distillation of leading practices from the Aquamark assessments, onsite interviews, and nominations from utilities and consultants. A summary of the themes and the basis for their selection are listed below. The leading attributes of these themes were exhibited by a limited number of utilities: it is clear that all participating utilities could learn from at least some of the attributes listed below, and indeed help provide focus for their improvement initiatives.

Culture and the Asset Management Organisation - Those utilities that were leading practitioners of asset management, or showed rapid development of their approach to asset management, demonstrated a combination of factors including leadership, clear and communicated goals, appropriate structures and a commitment to innovation.

Future Trends and Managing Uncertainty - How do we anticipate and respond to the rapidly changing external environment? This theme arose because we are in hugely uncertain times in the water sector globally. The challenges faced by participating regions in the project were quite different, but the approaches to managing uncertainty had some common ground. Three major global challenges for asset management were explored – Growth, Climate Change and Structural Reform, covering the various planning approaches.

Efficiency, Performance and Regulation - Customer needs, government regulation, corporate internal drivers and the desire to do better are driving an increased focus on utility efficiency and performance. This theme explored a range of approaches to improving delivery of services and aligning them to customer or regulator requirements.

Growth and Capital Delivery - Increasing capital works programs, limited internal resources, demand-driven service provider/contractor markets, and increased expectations are driving more innovative approaches to capital program delivery. This theme explored industry approaches to selection of the most appropriate delivery mechanism to meet needs while maximising market capability and limited resources.

Asset Management Planning - Are asset management plans critical to being able to deliver integrated lifecycle asset management? Some participating utilities had comprehensive AMPs for all assets, while others had very few. AMPs were prepared to varying levels of detail, in many formats and with a wide range of information available and degrees of confidence in their outputs. This theme explored processes and tools for asset management planning.

Sustainability (Business Risks, People, Environment and Knowledge) - This theme explored the fundamental elements to be taken into consideration in managing the sustainability of the utility organisation. The key principle here was that sustainability as a concept and practice is viewed and applied not only as an environmental issue, but associated with the life cycle of physical assets, people resources, and the acquisition and retention of knowledge.

Implementation Approaches - Sound asset management processes are of limited value unless they are implemented consistently across a utility. However, many organisations encounter difficulties in effectively implementing new processes. What actions can be taken to ensure the effective implementation of changes to asset management practices? This theme explored the key change management principles required to make the implementation of asset management changes successful and enduring.
Major Improvement Initiatives

A top-down and bottom-up approach was used to identify industry-wide initiatives. Top-down mapped important regional business drivers against overall Aquamark low scores across the participant group. Bottom-up aggregated all individual utility Improvement Initiatives and selected those topics of greatest frequency as industry-wide initiatives. The analysis clearly revealed improvements of greatest frequency were of a strategic and utility-wide nature, while less frequent initiatives were more tactical and operational.

The following major initiatives were identified to drive improved utility-wide asset management practice.

**Key Industry-Wide Improvement Initiatives (Strategic)**

*Initiative 1 - People Skills and Capability.* Participants in this study adopted a range of structures and management frameworks which worked to varying degrees to support each utility’s commonly cited most important asset – its people. Utilities demonstrating leading practices work to foster an environment where people are encouraged to develop their skills and capability and are rewarded for it. Staff development plans, training and succession planning are key improvements.

*Initiative 2 - Asset Management Operating Model and Organisation.* A strong asset management-based operating model can create a step-change in the capability of utilities commencing the process of integrating asset management concepts into their business, and developing strategic asset management capacity. Relatively advanced utilities can also benefit by regenerating focus and direction in asset management.

*Initiative 3 - Asset Management Leadership and Culture.* Asset management leadership and culture initiatives promote employee engagement and acceptance of asset management principles, process improvements, and decision-making capability.

*Initiative 4 - Asset Management Continuous Improvement.* Periodic self assessments of asset management capabilities using the Aquamark framework or similar tools will enable utilities to monitor the progress of their asset management Improvement Initiatives.

*Initiative 5 - Asset Management Plans.* Formalised Asset Management Plans allow capture of asset management intellectual knowledge and can significantly improve asset management decision-making by providing clear guidance. Understanding the proposed uses of Asset Management Plans, internally and externally, helps in establishment of a suitable Plan framework.

*Initiative 6 - Corporate Goals Linkage to Asset Management.* Adoption of consistent and clear corporate goals, including policy and business objectives, at an executive, business unit, team and individual level can significantly streamline the delivery of asset management.

*Initiative 7 - Quality Management System.* The implementation of a Quality Management System (QMS) improves the formalisation of processes and approaches, leading to sustainability of corporate knowledge, improved efficiency, consistency of approach and outcomes.

*Initiative 8 - Asset Data Management Strategy.* Utilities can expect significantly improved (efficient and accurate) investment decision making through aligning the collection, processing and management of data to meet business decision-making or reporting needs.

*Initiative 9 - Asset Management Information Systems Strategy.* Improved integration of business systems with respect to GIS, drawing systems, SCADA, analysis systems such as hydraulic models, the asset register and technical database, financial systems, risk registers, failure and condition registers and works management systems, all support efficiency in data management and decision-making.

*Initiative 10 - Maintenance Strategy.* A formalised maintenance strategy (incorporating reactive, preventive, predictive and replacement / rehabilitation strategies) for all assets is a necessary requirement to drive effective maintenance. The strategy should consider high cost or high risk assets first, along with pilot testing to confirm the delivery of maintenance objectives.
Other Industry Improvement Initiatives (Tactical)

A range of other improvement initiatives, less important in an overall sense, but deemed “tactical” improvements, directly related to key business drivers and were applicable to at least some participating utilities. These initiatives included:

- **Initiative 11 – Asset Based Costing System**
- **Initiative 12 – Corporate Risk Assessment**
- **Initiative 13 – Demand Planning**
- **Initiative 14 – Levels of Service Establishment and Forecasting**
- **Initiative 15 – Configuration Management**
- **Initiative 16 - Application of Triple Bottom Line and Risk Assessment Techniques In Capital Investment Evaluation and Optimisation**
- **Initiative 17 – Procurement Best Value**
- **Initiative 18 – Asset Acceptance Procedures**
- **Initiative 19 – Asset Criticality and Condition Assessment**
- **Initiative 20 – Renewals Evaluation and Forecasting**

Trends in the Benchmarking Results: From 2004 to 2008

In 2004 a similar Study, using an earlier but very similar version of the Aquamark framework, was undertaken by WSAA, involving 21 water utilities. The repeat participants comprised 16 utilities, including 13 Australian small, medium and large sized retail, wholesale and integrated water utilities, two New Zealand and one North American water utility. The results are shown in Figure 4.

Figure 4 Aquamark 2004 to 2008 Comparative Scores
The 2008 results for the repeat participant peer group show that Aquamark scores across all functional areas have improved since 2004 to varying degrees. Not surprisingly, there is a relationship between management improvement initiatives and process scores. Interestingly, severe drought conditions in Australia over the last decade have placed pressures on capital delivery, significantly lifting the profile of asset management in several small water utilities.

The greatest increase at a function level was in Corporate Policy and Business Planning, with a repeat peer group median increase of 10% since 2004, which is in line with improvement rates observed during previous WSAA civil maintenance and mechanical-electrical maintenance process benchmarking programs. Of the eleven key improvement recommendations made in 2004, the largest improvements were in the Corporate Policy and Business Planning processes of Configuration Management and Quality Management, with a smaller increase in Triple Bottom Line Management, even though the overall scores in most of these processes are still low and further improvement is recommended.

There was a moderate increase in the score for Asset Maintenance since 2004, due to increased levels of attention being given to Business Based Maintenance Strategy, and Maintenance Procedures Documentation. This is aligned with previous improvement rates in relatively mature utilities.

There were nominal increases in Asset Acquisition due primarily to the need to seek innovation approaches to significantly increased capital programs; and in Asset Replacement and Rehabilitation from increased efforts in the Identification of End of Economic Life. A similar improvement in Business Support Systems was concentrated on improvements in equipment registers, GIS, SCADA and customer service systems.

There was insignificant or no change in the functions of Asset Capability Forward Planning and Asset Operations.

Several water utilities scored lower in some functional areas than they recorded in 2004. The key reasons for this decrease were identified as industry reform changing the scope of services or leaving gaps in processes, intra-utility changes such as leadership or organisational structure changes, or simply a change in asset management maturity leading to a different and firmer view on Aquamark scoring.

**Concluding Remarks**

This project provides a substantial body of knowledge for building improvements in asset management. Irrespective of the history and context of each utility in terms of region, function, size, ownership, or form of regulation, participants were keen to improve their asset management processes and, by inference, their performance for customers, shareholders, staff and other stakeholders.

The best water utilities take three additional and clear actions:

1. They invest in demonstrable leadership of the change initiative. Effective asset management is enabled by the active support of the most senior executives, and is in turn supported by a detailed ‘bottom up’ commitment to specific, targeted improvement initiatives.

2. They regard asset management as an integrated whole, and create initiatives which lead to improvement as part of a cohesive plan (and avoid working in silos).

3. They appreciate that building a strong asset management capability takes years – they see it as a journey, and no matter what other issues they confront, they stay focused on the core asset management improvement tasks.

As the shift between the 2004 and 2008 results clearly shows, improvement is possible. A conscious decision to improve is at the heart of success.