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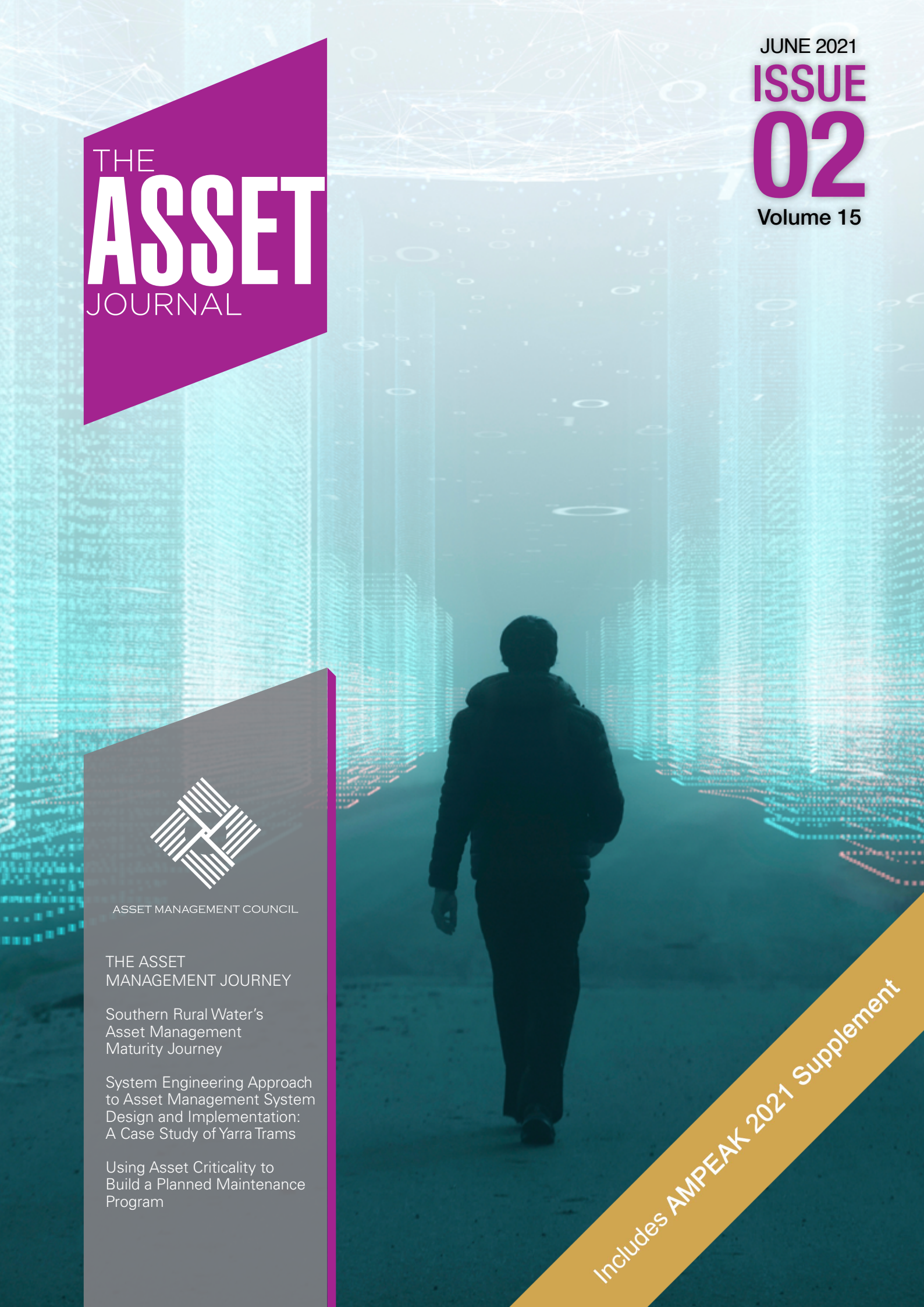

ASSET MANAGEMENT COUNCIL

THE ASSET MANAGEMENT JOURNEY

Southern Rural Water's Asset Management Maturity Journey

System Engineering Approach to Asset Management System Design and Implementation: A Case Study of Yarra Trams

Using Asset Criticality to Build a Planned Maintenance Program

Includes AMPEAK 2021 Supplement

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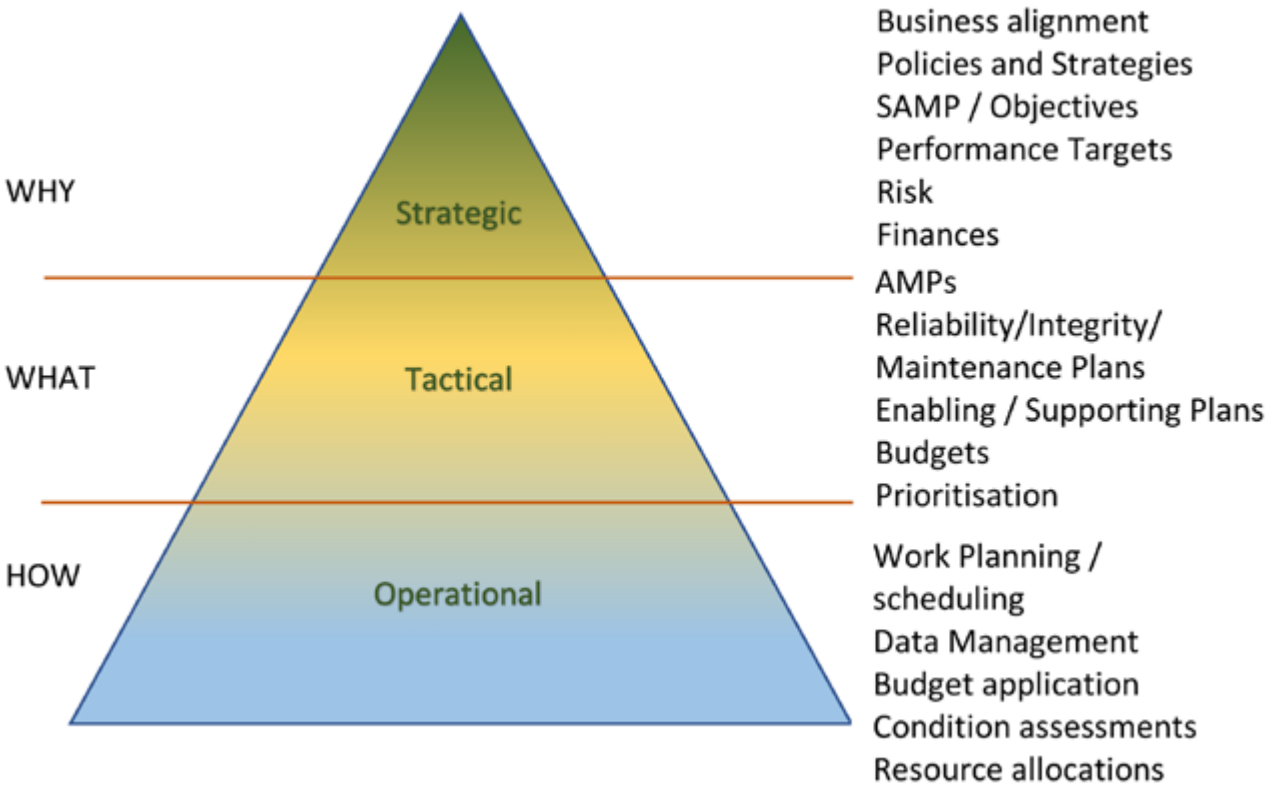
EDITOR IN CHIEF

ASSET MANAGEMENT JOURNEY

An Asset Management System is a natural extension of a Business Management System. The difference is that the Asset Management System focusses specifically on the Assets required to achieve Business outcomes by extracting maximum value from those Assets that enable the Business to function. As such, Asset Management then has the propensity to affecting the whole business and the organisation delivering objectives, outcomes and value. A decision to adopt an Asset Management System should therefore start with these questions, particularly clarifying the "WHY".

When recently discussing the impending Asset Management journey with a Client's Managing Director, it became clear that the reasons for implementing an Asset Management System was not really clear in the person's mind. It was more a reaction to the mention of a 'good idea' to follow ISO 55001 to develop maintenance. Which is of course not at all the primary reason for Asset Management – it is rather the life cycle control over Assets and the values generated. Once clarified what Asset Management entails, there was realisation that the journey actually affects all that are involved with this new and substantial Asset in question.

Clarity of purpose, clear direction and support from the top-level management team are the imperative ingredients to make the Asset Management Journey a success. Of vital importance is to realise that an Asset Management System is the framework for how an organisation will operate and hence needs to structure processes and procedures to ensure that the Asset Management and Business Objectives can be met. Of course, that does not mean that what an organisation currently does and the present processes and procedures in place should be thrown out. On the contrary, we would re-use as much of current workings as is relevant and supportive. A good starting point has been proven in my observation and practice to carry out a readiness for Asset Management review. This will inform the organisation of priorities to attend to prior to designing the Asset Management Framework and System. This survey can be structured around the 39 Asset Management subjects that have been defined as relevant to Asset Management. Careful examination of which of these subjects are appropriate for the new Asset Management System is advisable in order not to create an organisation that is not delivering value to the Stakeholders and the Business.



A structured Change Management and Transition plan will further aid the successful implementation of a far-reaching change to how an organisation operates. This structured approach assists all involved to come up with aligned processes and outcome focus by delivering the capabilities that ensure the required Objectives.

In today's digital and digitised world, it is of particular importance to define data and information requirements that fit with the Asset Information Strategy and all the various Asset models that are created digitally. Systems such Building Information Management (BIM) Systems have by now outstripped the focus on buildings alone, any Industrial facility can benefit from this structured and gated approach to defining data and information requirements to seamlessly integrate with other Business and Technical systems.

The challenge of implementing an Asset Management System is influenced by the timeframe for the implementation. Decisions as to how far an alignment or conformance with the ISO 55001 Standard is desired or if certification to ISO 55001 is beneficial have to be made. That generally depends a lot on whether a Governmental or Regulatory requirement for certification exists, or whether Stakeholders require such certification.

The Asset Management journey may take significant period of time during which it is difficult to maintain momentum and focus. Transformation of sections of the new framework and creation of plans may ease this risk of stagnation somewhat. Specifically, a SAMP may be a good start to focus those that deliver tactical and operational outcomes, as the logic progression is to formulate the Asset Management Plans next. Like with all Projects, a stage gate approach to check the actual achievements may also be prudent.

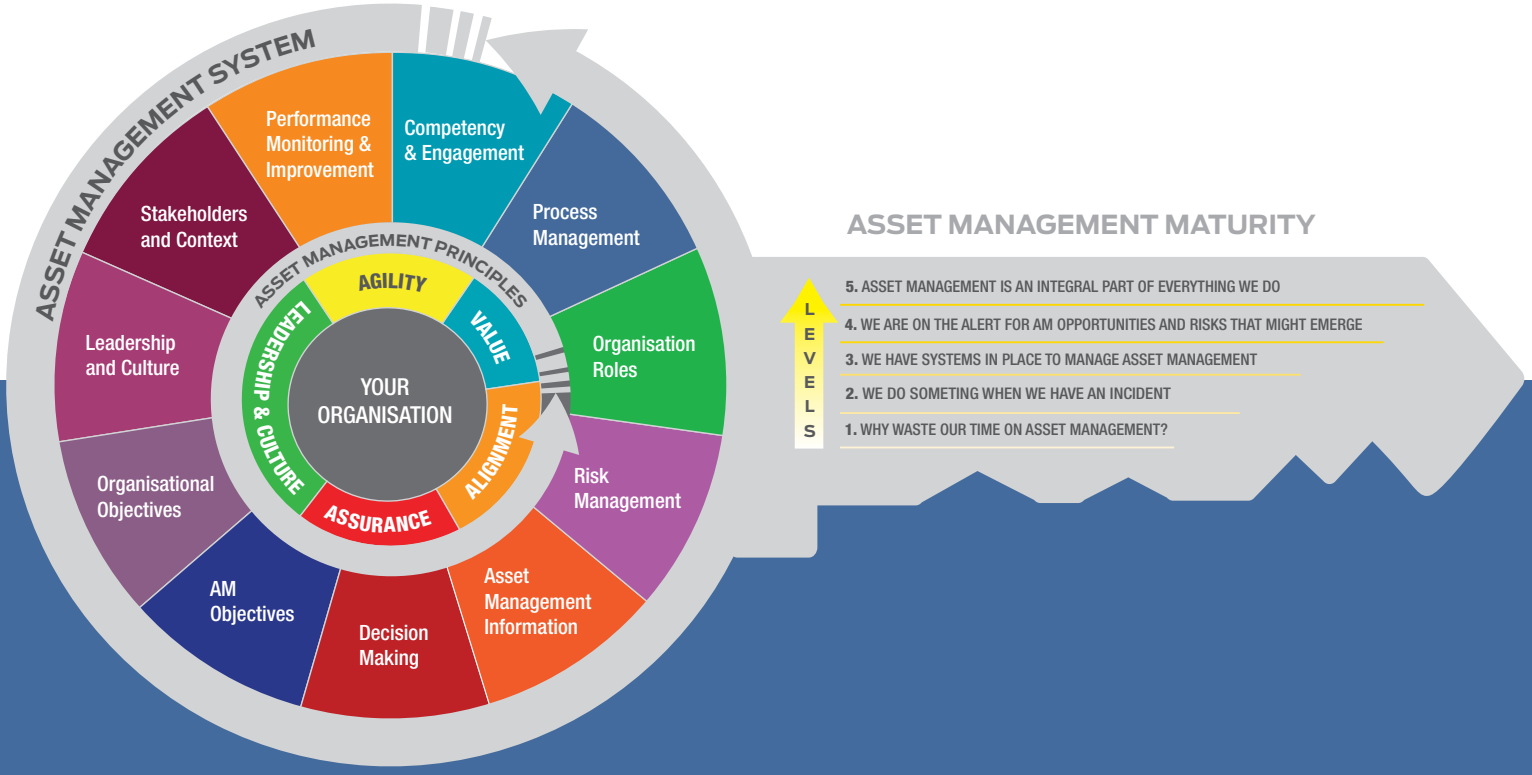
Finally, when all is done, the Asset Management System is implemented and functioning, what assurance does the organisation have that the processes are sustainable and working? The Asset Management Maturity assessment, based on self-assessment and a more thorough Maturity Audit approach where an external party verifies the assessments and the whole system provides assurance of functionality. It is sad to see that some early adopters of an Asset Management System, either in line with PAS 55 or ISO 55001, are now in a situation where they have to start their journey to effective Asset Management again due to slippages and the decline of the initially successful implementation of their Asset Management System.

An Asset Management life cycle management plan should be incorporated into the Strategic Asset Management Plan to ensure the sustainability and effectiveness of an implemented Asset Management System. It would be prudent for Asset Management System owners to refer to the Maturity Assessments developed by the Asset Management Societies and those that conform to the JAS/ANZ guidance for Asset Management Auditors. Too often local Consultants are providing these services with certification that is perhaps not fully aligned with the maturity assessments developed by the AM societies. A recent involvement with an Overseas Client revealed that the Client achieved certification to ISO 55001, but had a SAMP in place that did not provide clear direction and objectives, the associated processes were not directed to life cycle management of the Assets and had other deficiencies. Such certification is not helpful to Industry and Publicly owned Assets. The utilisation of certified Asset Management Assessors (CAMA) will alleviate such outcomes and ensure sustainability of an Asset management System when regularly carried out.

A journey to achieve a well-functioning Asset Management System is an exciting one and while it has potentially many hurdles to overcome, benefits form a considered implementation planning process and staged implementation to provide the deep understanding of the many subjects and competencies required. Business benefits from implementing an Asset Management System are now also emerging as tangible outcomes for those that have veritable Systems in place that make it worthwhile for others to undertake this journey.

Unlocking value in asset management

ASSET MANAGEMENT COUNCIL



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FROM MY DESK: CHAIRMAN'S LETTER

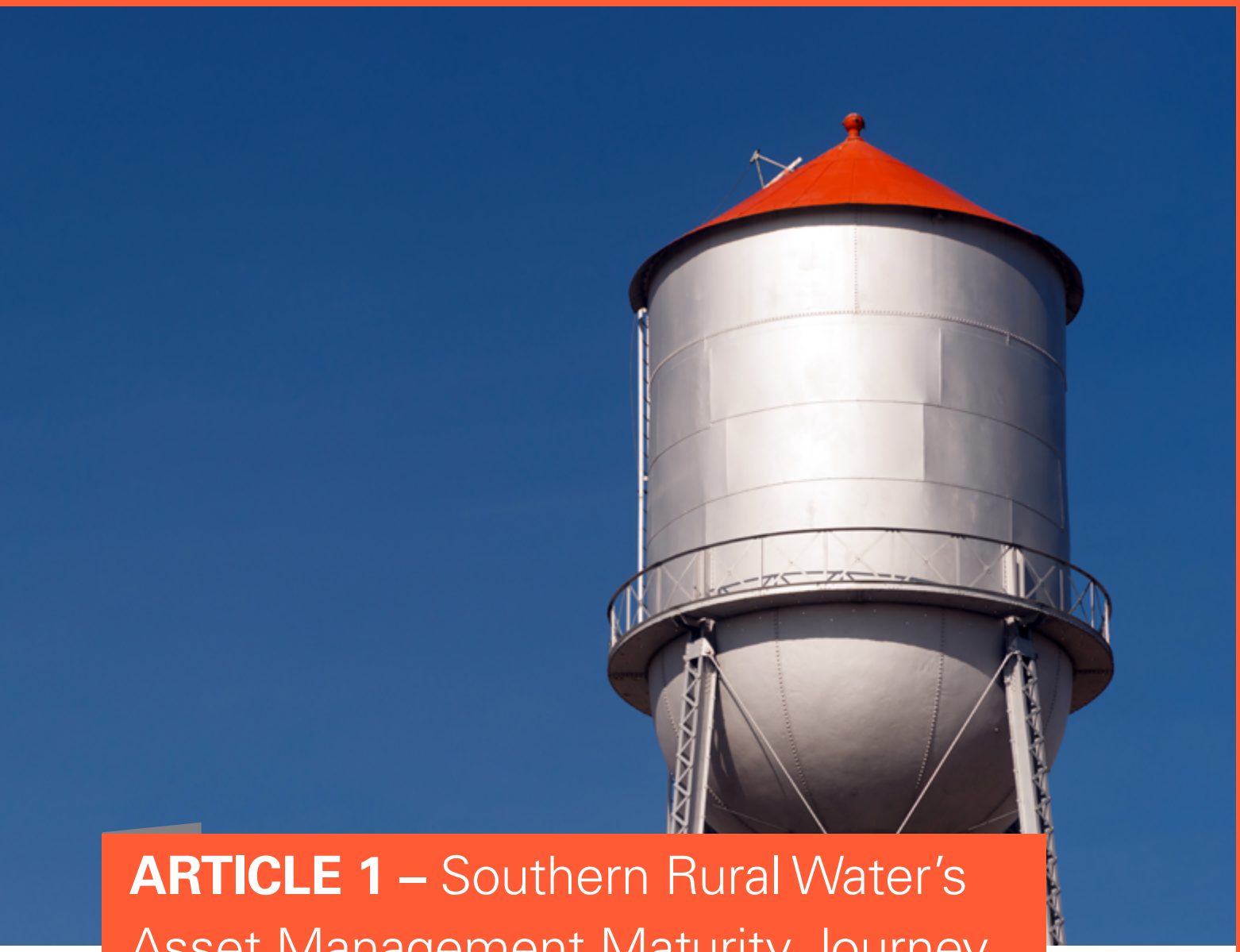
CHAIRMAN, DAVE DAINES

There are numerous quotes about the journey and destination with one of my favourites being - Sometimes its the journey that teaches you a lot about your destination. The ISO 55001 Standard was released in 2014 and is now entering the review process seven years later.

During that time, many organisations have developed and implemented an asset management system that conforms with or aligns to the International Standard. I have been fortunate to witness a number of organisations undertake this journey and invariably the approach taken has been quite different. Whilst the scalability of ISO 55001 has been questioned, it is evident from the diverse range of organisations undertaking asset management that they have been able to adapt to the requirements. From state governments to small business the road to developing and implementing asset management requires different approaches. This has also been evidenced by the variety in the structure and format of the key artefacts of an Asset Management System that whilst different from the accepted norm, still meet the requirements. However a common theme through all of the AM journeys has been that success in always attributable to strong Leadership and the capability of the individuals within the organisation. Invariably this is a key lesson for the organisation

This edition of the Journal highlights the journey a number of organisations have taken over the years and provides good insight to the lessons learnt along the way.

David Daines
National Chairman, Asset Management Council.



ARTICLE 1 – Southern Rural Water's Asset Management Maturity Journey

Amos Micallef, Nicole Griffin, Frédéric Blin, Michael Battaini & Amalia Tsalanidis Southern Rural Water / AECOM Australia

Summary: Developing Asset Management (AM) maturity within organisations is of increasing importance; with governmental requirements of Asset Management Accountability Framework (AMAF) attestation, compliance with the Victorian Data Asset Strategy and alignment with ISO 55001. For organisations and utilities to align and attest to these frameworks, an understanding of current AM practices and improvement opportunities is essential, helping to realise value not just to the organisation, but critically, to its customers. This paper outlines Southern Rural Water's motivation for change, the results of its maturity assessment as well as the development and the outcomes of its Asset Management Improvement Program (AMIP). The scope of the works highlighted the improvement opportunities that can be efficiently and effectively realised through close collaboration, a customer and value mindset as well as knowledge sharing and transfer.

Keywords: Asset Management Maturity, Maturity Assessment, Improvement Plan

1. INTRODUCTION

1.1 Motivation for change

Southern Rural Water (SRW) is responsible for managing government-owned water infrastructure and water resources for over 10,000 customers with an asset portfolio of over $1.3 billion in value. This includes the three major irrigation districts, the operation and maintenance of seven major dams, managing licensed water use from southern Victoria's unregulated rivers and groundwater aquifers.

In 2017 Southern Rural Water (SRW) wanted to review and strengthen its Asset Management (AM) maturity. For SRW, AM is about providing a clear line of sight to its customers. Its asset management decisions and practices, including levels of service and pricing, have a direct impact on the various customer groups. How SRW intend to manage older assets and new assets so that customers can keep producing economic value is growing in importance. This was particularly important as SRW was in the process of delivering modernisation projects that helped transition to a new and improved asset base. This was also driven by its Statement of Obligations, which included complying with the Asset Management Accountability Framework (AMAF) from the Victorian Department of Treasury and Finance (DTF).

The current climate for the development of AM at water utilities is generally to seek alignment rather than certification with ISO 55001 (as per its Statement of Obligations with the Victorian Government) together with other guidelines as deemed suitable by the organisation. In this sense there is a focus on "continual improvement" and the key objective of this type of assessment is to demonstrate an awareness of current maturity and an improvement plan to reach the desired level of maturity. The desired level of maturity varies from organisation to organisation depending on their specific needs, business environment and opportunities.

2. MATURITY ASSESSMENT

2.1 Background

SRW's 2017-2018 corporate objectives were supported by a number of enablers including "improving our asset management"; with the aim of the maturity assessment being to feed directly into this key enabler. The scope of the maturity assessment was to:

- Review alignment with ISO55001 based on assessment against IAM 39
- Provide a baseline asset management maturity assessment; and

Table 1 – IAM 39 Maturity Scale

Scale	Description	Summary
0	Innocent	Need for item not recognised and/or there is no evidence of commitment to put it in place.
1	Aware	The organisation has identified the need for this requirement, and there is evidence of intent to progress it.
2	Developing	Identified the means of systematically and consistently achieving the requirements. Can demonstrate that these being progressed with credible and resourced plans in place
3	Competent	The organisation can demonstrate that it systematically and consistently achieves relevant requirements set out in ISO 55001.
4	Optimizing	The organisation can demonstrate that it systematically and consistently optimizing its Asset Management practice, in line with the organisation's objectives and operating context.
5	Excellent	The organisation can demonstrate that it employs the leading practices and achieves maximum value from the management of its assets, in line with the organisation's objectives and operating context.

- Provide an AMIP with multiple criteria for prioritisation.

The assessment of SRW's AM maturity was conducted in a streamlined manner using the Institute of Asset Management's (IAM) 39 subject areas of Asset Management as the overarching framework. This framework provides a broader view of an organisation's AM maturity as well as capturing specific requirements of ISO 55001 and is a well-accepted international standard with the Global Forum on Maintenance and Asset Management (GFMAM) also following the same 39 subject areas. It can also be used as a supporting base for much of DTFs AMAF which includes attestation to mandatory requirements that have been phased in since 2017-18 annual reports. Drawing on the 39 subject areas and the associated maturity scale, the Asset Management System (AMS) and AM practices were assessed based on a combination of reviewing SRW's documentation and interviews with various stakeholders at SRW. The assessment was conducted through a combination of document review and on- site interviews with key personnel at SRW offices, which were organised with a focus on the IAM 39 guideline.

This review was carried out through a series of open, guided discussions based on IAM with a focus on developing a roadmap for improvement. Instigating this type of work by creating a deficit record through a strict audit can illicit an inefficient reactionary approach or inaction due being overwhelmed by actions. Once the IAM assessment was complete, a customised tool was used to map the subset of clauses and results that provided an assessment specific to ISO 55001:2014. Data was then collated, checked and challenged by team members and was finally challenged by the team's ISO 550001 lead accreditor and trainer.

2.2 Approach to scoring

The general scoring guide is provided in Table 1. It was agreed that a target maturity level of 3, i.e., alignment with ISO 55001, would serve as the initial benchmark level and also aligned with SRW's asset management policy.

The approach used for scoring across the different guides/standards was:
IAM: assessment based on documented evidence and interviews. The starting point for this was consideration of the individual clauses for a maturity level of 3, then moving up or down with consideration of compliance with these defining clauses.

- ISO: assessment against the clause as well as its related IAM subjects

2.3 ASSET MANAGEMENT MATURITY ASSESSMENT RESULTS

2.3. IAM 39 Maturity Level

As show in Figure 1, SRW's maturity level for the 39 IAM subjects was between a 2 and 3. This maturity level is typical for Australian water utilities1. A significant qualification acknowledged in these results was that the maturity characteristic requires a "documented Asset Management system embedded within the organisation" with its elements being "measured, reviewed and continually improved". At the time the assessment was conducted the Asset Management system consisted of a set of loosely connected key documents, which made evaluation more challenging. With a clear intention to develop a Strategic Asset Management Plan (SAMP) to encompass the strategic elements already present, it was considered that the basis for this component was in present, but not consolidated (as noted below, SAMP creation was carried shortly after this assessment).

2.3. ISO 55001 Alignment

The IAM Maturity Scale was used as an indicator of compliance, with a Maturity Level of 3 representing compliance. This is not an exact mapping as the IAM 39 subjects cover some areas not required by ISO 55001. In this case, the responses have been interpreted in the specific context of ISO 55001. Also note that assessment of compliance to ISO 55001 would typically result in a binary compliant or non-compliant rating. To provide a more practical and informative guide for improvement the 0 to 5 scoring from IAM 39 has been transferred across to the ISO 55001 scoring.

Figure 1 – IAM Maturity Level for 39 subject areas

IAM 39 Subject
1. Asset Management Policy
2. Asset Management Strategy & Objectives
3. Demand Analysis
4. Strategic Planning
5. Asset Management Planning
6. Capital Investment Decision-Making
7. Operations & Maintenance Decision-Making
8. Life Cycle Value Realisation
9. Resourcing Strategy
10. Shutdowns & Outage Strategy
11. Technical Standards & Legislation
12. Asset Creation & Acquisition
13. Systems Engineering
14. Configuration Management
15. Maintenance Delivery
16. Reliability Engineering
17. Asset Operation
18. Resource Management
19. Shutdown & Outage Management
20. Fault & Incident Response
21. Asset Decommissioning & Disposal
22. Asset Information Strategy
23. Asset Information Standards
24. Asset Information Systems
25. Data & Information
26. Procurement and supply chain management
27. Asset Management Leadership
28. Organisational Structure
29. Organizational Culture
30. Competence Management
31. Risk Assessment and Management
32. Contingency Planning & Resilience Analysis
33. Sustainable Development
34. Management of Change
35. Assets Performance & Health Monitoring
36. Asset Management System Monitoring
37. Management Review, Audit and Assurance
38. Asset Costing and Valuation
39. Stakeholder Engagement

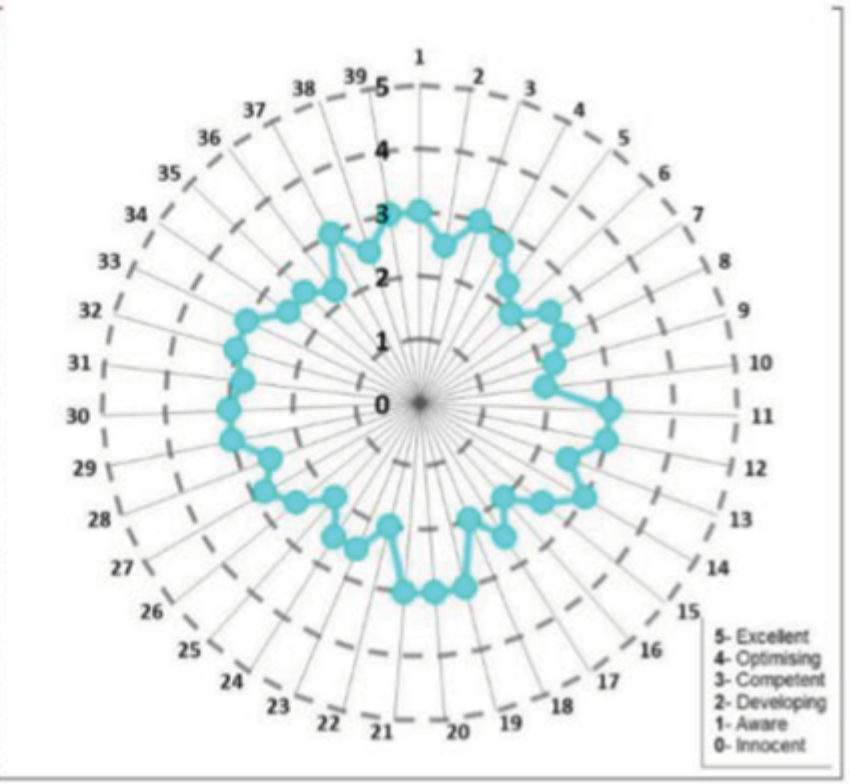
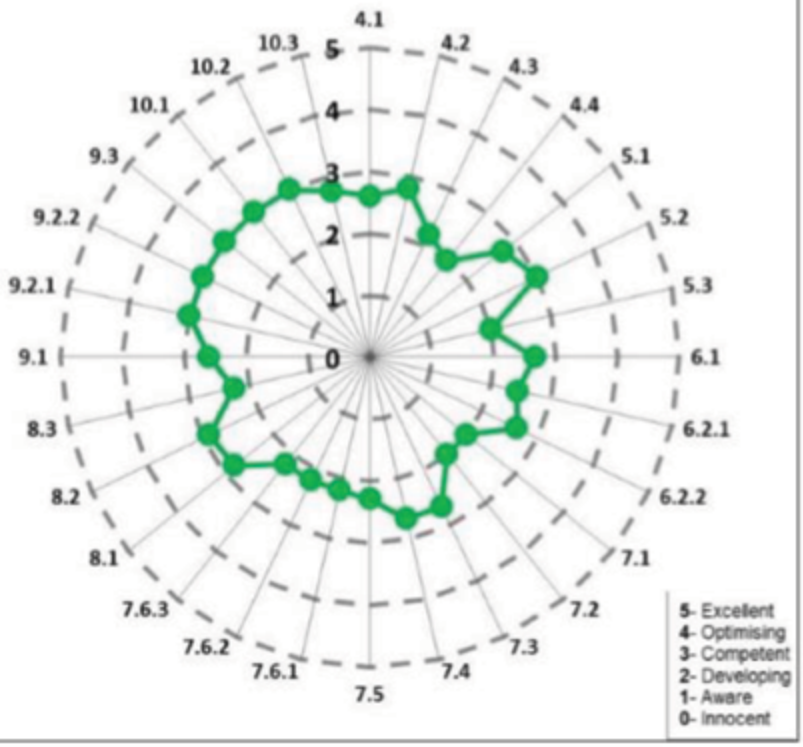


Figure 2 – ISO 55001 Scoring

ISO 55001 Clause
4.1. Understanding the organization and its context
4.2. Understanding the needs and expectations of stakeholders
4.3. Determining the scope of the asset management system
4.4. Asset management system
5.1. Leadership and commitment
5.2. Policy
5.3. Organizational roles, responsibilities and authorities
6.1. Actions to address risks and opportunities for the asset management system
6.2.1. Asset management objectives
6.2.2. Planning to achieve asset management objectives
7.1. Resources
7.2 Competence
7.3. Awareness
7.4. Communication
7.5. Information requirements
7.6.1 Documented information: AMS
7.6.2 Documented information: Creation and update
7.6.3 Documented information: document control
8.1. Operational planning and control
8.2. Management of change
8.3. Outsourcing
9.1. Monitoring, measurement, analysis and evaluation
9.2.1 Internal audit: AMS check
9.2.2 Internal audit: Program, criteria
9.3. Management review
10.1. Nonconformity and corrective action
10.2. Preventive action
10.3. Continual improvement



3. AMIP DEVELOPMENT AND IMPLEMENTATION

Based on these findings the prioritised AMIP was developed around gaps against the relevant guidelines, as well as factors to be considered in implementing these improvements and based on knowledge of the successful pathways used by others. Ultimately this sought to develop the AMS in the most beneficial way to achieve SRWs corporate objectives as outlined in its 2017-2018 Corporate Plan.

3.1 Improvement Options

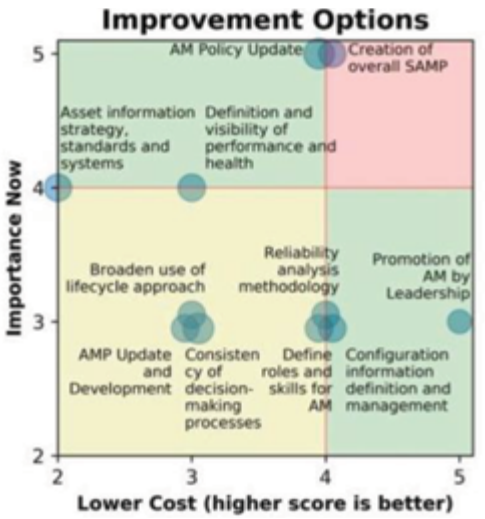


Figure 3 – Summary of improvement plan options considered in terms of cost and importance

The improvement options developed from the assessment were summarised in terms of cost and "importance now" in Error! Reference source not found..

From here a two year aspiational program was developed. Low cost, strategic direction intiatives including SAMP produciton and asset class planning were prioritised, with higher cost longer term decisions incluing selection of an asset managment information system (AMIS) to meet SRWs needs were deferred until an uplift in maturuty, capability and capacity is in place.

3.2 First Initiative Implemented: SAMP & AM Policy Update

SRWs SAMP creation represented the first step in the asset management improvement program and alignment to a formal framework, presently ISO 55001. The development of the SAMP was a collaborative process involving stakeholders from across the business to demonstrate to internal and external stakeholders that SRW has a sound understanding of its assets and a mature AMS that is continuously improving. Throughout the development of the SAMP, emphasis was made on continual improvement and "line-of-sight". The Asset Management Strategies were developed during the workshops to be aligned with SRW's AM Objectives and AMIP tasks, with the intent to regularly review and update as their maturity increases over time. A detailed monitoring and review program for the AM Policy, SAMP, AMIP, Asset Management/Class Plans and the AMS was established to support attestation requirements of the AMAF and to guide continual improvement. Lastly, a "SAMP on a Page" (Figure 4) was developed, with the intention to disseminate essential information in an easyto-read format that allowed for distribution throughout the organisation. The intent of this was to increase Asset Management awareness throughout SRW, and to give staff an understanding of how AM Objectives and Strategies impact on the organisation.

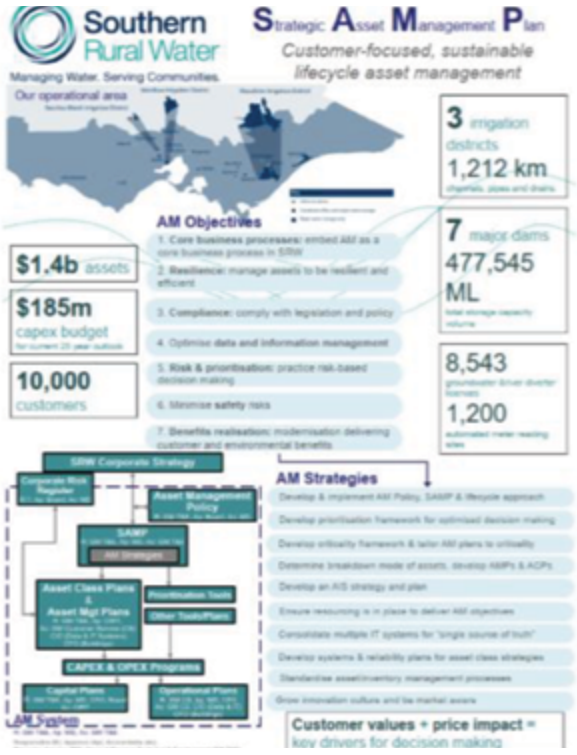


Figure 4: SRW's "SAMP on a Page"

4. STEPS AFTER SAMP IMPLEMENTATION & RESULTS

The first initiatives in the improvement plan to be enacted were:

4.1 Promotion of AM by Leadership

A series of targeted workshops to communicate the improvement program, benefits and impacts on the business were initiated early in the journey. In parallel, workshops were held with the executive around the development of a SAMP and its strategic value

Key components of the proposed asset management framework were introduced, and relationship and importance to operational performance were communicated and presented. The workshops together with the formation of an AM steering committee provided a step change in understanding of an AM framework across the organisation.

4.2 Consistency of Decision-Making Processes: development of a Prioritisation Tool

Through consultation and workshops with senior managers, an updated capital prioritisation tool was developed and aligned with SRWs corporate risk framework and corporate strategy value drivers.

The creation of the tool through collaboration and its roll out in recent corporate planning cycle, has provided additional visibility and understanding of capital planning decisions across the organisation. In addition to decision making, the application of the tool and its embedment SRWs capital planning processes has proven to be a valuable engagement tool in promoting the value of AM decision making frameworks.

4.3 Define Roles & Skills of AM

A competency framework and self-assessment gap analysis tool was developed across IAM and ISO 55001 subject areas. Beginning with an asset management improvement team, the tool proved valuable in confirming areas of competency improvement around knowledge of asset management standards, framework and asset data management. SRW has now created a training and skills development plan for key AM staff, and developed a dedicated team structure around AM improvement. The tool has now been deployed into an operational team to assist in a similar process.

4.4 Asset Management Plan (AMP)/Asset Class Plan (ACP) Update and Development

Prior to launching into an AMP and ACP development phase, a road map was created to inform the timeline, effort and resources to create ACP's not currently prepared and update previous AMP's. Through consultation, templates for an AMP and ACP were created to reflect the specific the needs of asset managers and decision makers at SRW. SRW has commenced the journey preparing ACPs and AMPs not present in our asset management thinking prior to the maturity assessment. The road map provided a valuable tool in setting expectations, resources and promoting the value of good asset management planning across the organisation.

4.5 Configuration Information Definition and Management

An asset management information road map and assessment tool was created to assist SRW in identifying its areas of data management improvement, importance and priorities. Together with a future AM AMIS and GIS strategy, SRW will use this as a basis for developing a targeted improvement program around data definition, asset management information system improvement and uplift in works management scheduling.

4.6 Development of Criticality Framework

Through the ACP development phase, defining asset criticality was quickly identified as an important process in linking our AM policy and SAMP direction to focus management activities on critical assets. SRW has since created an asset criticality framework and selfassessment tool to begin identifying high criticality assets to inform management decisions.

These initiatives aimed to improve AM maturity in a holistic manner. Maturing an AM culture requires "leadership from the top", so particular importance initially was placed on AM awareness and leadership. Tools and guidelines also played an important role in allowing SRW asset managers to make a substantive and early step change in AM practices and processes including prioritisation or works and self-assessment. Together with other decision-making tools, AM planning initiatives and frameworks SRW has improved its AM maturity, insight and capabilities. Over time, the intent is to embed

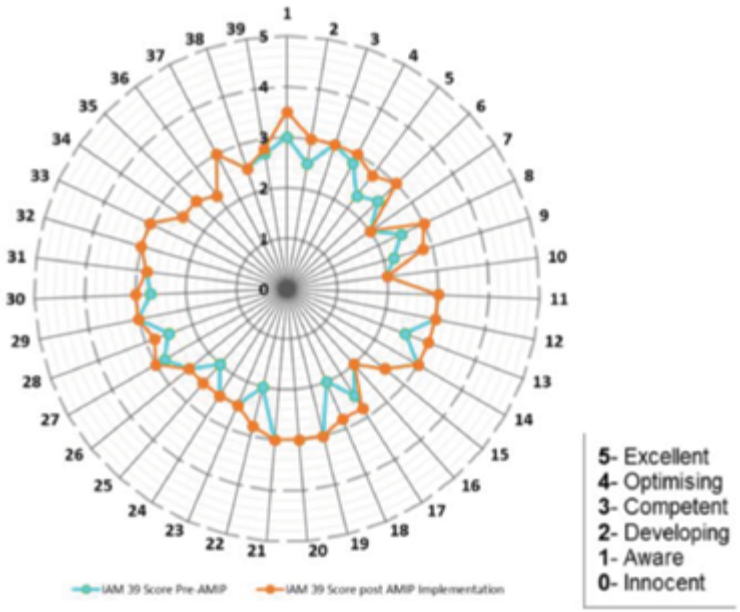


Figure 5 – Change in scoring pre- and post-AMIP implementation

and link these new processes and frameworks into more sophisticated enterprise management tools and improve visibility of our asset performance. A brief review of AM maturity showed a distinct change in scoring (Figure 5) in SRW's maturity before the AMIP and at the current stage of AMIP implementation. It is expected that once more tasks are implemented and become business as usual, the scoring will again increase.

5. NEXT STEPS

- The Roles & Responsibilities self-assessment was applied to the Western Irrigation Business Operations & Maintenance team, whose assets had recently undergone a significant upgrade in technology.
- Application of the Criticality Framework to physical assets to update the Critical Assets Register.
- Integration of processed outputs and framework structures into formats suitable for use by various audiences, especially at the executive level.
- Opportunity identified to develop "3-Tier" Digital Asset Class Management Plans to enable better decision making. These three layers would comprise of an Asset Lifecycle Model (integration of various data sources), Decision Support Tol and Input Criteria and the "hardcopy" Asset Class Plans.

6. CONCLUSION

Through strategic initiatives, SAMP development and implementation of new tools, SRW have made substantive and rapid improvements to the AMS and AM practices, awareness and overall maturity, leading to more optimised decisions. The increased focus on AM throughout the organisation has influence the culture of SRW, with more staff taking interest in how AM can improve day-to-day operations as well as customer satisfaction. Further improvements of AM tools, processes and frameworks will result in an increased maturity, and more effective and efficient decision making for the future. The work outlined in this paper has demonstrated the benefits of taking a collaborative and pragmatic approach, developing targeted tools and frameworks that allow the bootstrapping of AM practices, rapid identification of gaps and clear understanding of the organisation's specific needs to reduce risks and costs in potentially committing to more advanced changes and solutions in the future.

7. REFERENCES

[1] Southern Rural Water Asset Management Maturity Assessment and Improvement Plan, 2018. Prepared by AECOM. Document no. 60558924-P-SAM_001

[2] ISO 55001:2014, Asset Management – Management Systems – Requirements.

[3] Water Services Association of Australia, 2016. Available at: https://www.wsaa.asn.au/sites/default/files/publication/download/170314_AMCV-Industry%20Report.pdf

TECH 2

ARTICLE 2 – TSystem Engineering Approach to Asset Management System Design and Implementation: A case study of Yarra Trams

Allen Tam & Victor Choo

Summary: This paper summarises the learnings and insights gathered through a 2-year journey of how the CEAM (Central Engineering and Asset Management) team designed and implemented the Asset Management and Engineering Management Systems. An integrated management systems approach is applied with both management systems supporting each other. Existing practises and procedures were reviewed to determine if an update is required, and if multiple similar processes existed across departments, a common process is change managed to be adopted into the business. The paper reflected on the journey and summarised the learnings into four "Yes" and four "No".

Four Yes are:

1. Yes to leadership commitment
2. Yes to centralised approach
3. Yes to training and competency development
4. Yes to integrated management system and change management approach

Four No are:

1. No to silos
2. No to reinventing the wheel
3. No to confusing terminologies and understandings
4. No to change fatigue

1. INTRODUCTION

The Victorian Government's objectives for the Melbourne Metropolitan Refranchising Project (MR4) include enhanced asset performance, through strategic asset management and improvements in the underlying asset condition to optimise the operation of the tram system. The State suggests that improved asset management framework and practices should include:

- a more strategic approach to maintenance and renewals;
- a more balanced consideration of asset classes;
- addressing identified risks and network vulnerabilities;
- linking risk management to maintenance and renewal prioritisation;
- fully developed asset management and renewals programs, planned over the Full Franchise Period;
- improved data collection and analysis, including reliability, fault analysis, asset condition monitoring and lifecycle analysis; and
- enhanced approaches to maintenance and continuous sustainable management of operational control and
- management systems.

Importantly, Yarra Trams are obligated to be certified by an Accredited Certification Body as complying with AS/NZS ISO55001:2014 Asset Management – Management Systems – Requirements and demonstrate compliance to ISO15288 Systems and software Engineering – System life cycle processes. Both within 2 years of the Franchise period. This paper describes the approach and the journey the team undertook and reflected on our learnings. (Keolis Downer Yarra Trams CEAM, 2017)

2. APPROACH

The main requirements of the management systems are: Able to certify to ISO 55001

Simple yet Pragmatic – We do not want to overly complicate

Describe existing good practises and make it common across the business

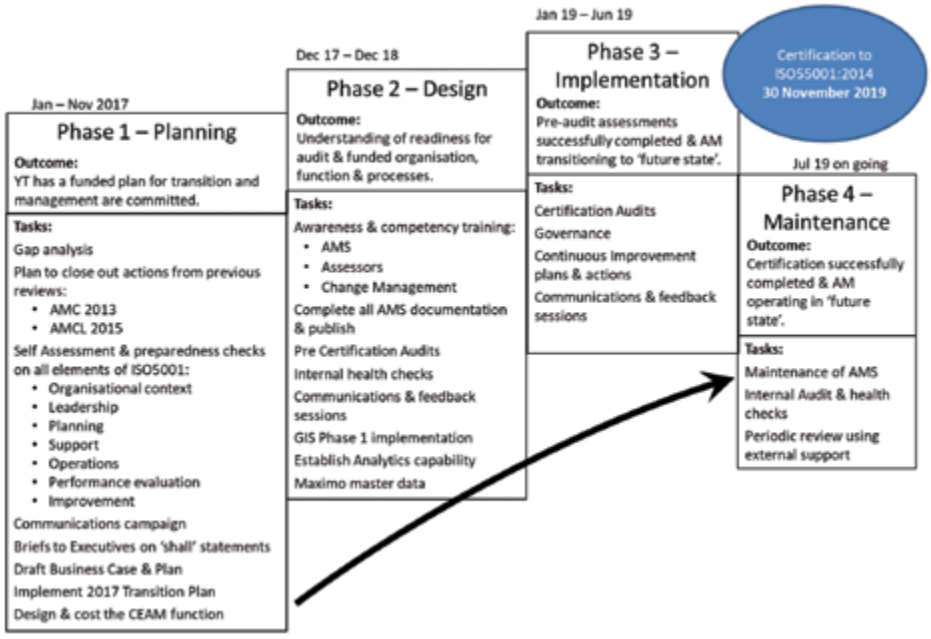


Figure 1 – ISO55001 and ISO15288 Roadmap

Use established international practises, not create new ones

Integrate with existing Management Systems (such as Safety and Project Management)

Make it easy for staff to understand

Our approach over last 2 years was divided into in 4 phases: Phase 1 – planning, Phase 2 – Design, Phase 3 – Implementation and Phase 4 – Maintenance. This is illustrated in Figure 1. This paper will focus on our activities from phase 2 to phase 4.

2.1 Phase 2 – Design

The first thing we did when we entered phase 2 design is to establish a goal – Yarra Trams has decided that not to treat this as a checkbox ticking exercise but to create real value into Yarra Trams. This intent leads us to establish the Engineering and Asset Management (EAM) Operating Model and Asset Management. The "System-of-Interest" (SOI) is, hence, determined to be the Asset Lifecycle Management operating methodology. The Systems Breakdown Structure of the SOI is illustrated in Error! Reference source not found..

With the understanding of the intent and systems breakdown, Yarra Trams applied the widely used V-model in Systems Engineering ((ISO/IEC JTC 1/ SC 7 Software and systems engineering, 2015) to guide our systems design and transformation. We enter from Concept and Requirement being passed onto us as Franchisees to obtain the ISO 55001 (ISO/TC 251 Asset management, 2014) certification.

To assist us in determining the Specifications, we engaged an external consultancy to conduct an assessment on the current practises against the ISO 55001 standard to establish our gaps. The Gap Assessment reported 15 recommendations for improvement. This provided us with a starting point in our design.

We cycle through Design, Production and Test on the System Elements (Figure 5). For example, the Framework for Asset Management went through several iterations, from Design, and Production, and Testing with our stakeholders and trying to see how fares with the organisation and validating if the design meets the Requirements stated above.

When we were satisfied with our Testing, and that the requirements were adequately met, we move onto Integrate the system into existing Management Systems, ensuring that the current suite management systems documents point accurately to the correct host and ensure that the 4 systems (Safety Management, Project Management, Asset Management and Engineering Management Systems) work together as an Integrated System. This process also confirms that there is one process/approach addressing the same issue, without duplication or misalignment. This will be discussed further in Error! Reference source not found. Error! Reference source not found..

Commissioning phase includes Training, and Certification. An initial phase of training was given to the entire organisation on both Asset and Engineering Management Systems, breaking them down into Awareness trainings and Understanding trainings, targeting different levels of expected expertise. Our final commissioning testing was effectively an external audit.

Verification and Validation are conducted throughout the journey. One key method we applied prior to certification audit was the Verification and Validation (V&V) matrix. Using the clauses of the ISO 55001 and the recommendations given through the Gap Assessment, a V&V Matrix was used to determine the type of artefacts needed to fulfil the clause.

2.2 Implementation

The implementation phase started in July 2018, in the middle of the design phase. Wave 1 of the implementation and launch focused on Asset Management concepts and fundamentals and Wave 2 focused on the introduction of Asset Management System. Yarra Trams has utilised the first 2 waves of implementation & launch of the asset management system as part of the V&V exercise which has resulted in a major uplift and change of our asset management system, that is comprehensive and pragmatic. Figure 6 illustrates the evolution of our AMS since the start of the MR4 contract period.

During Wave 2, the central engineering and asset management function team have 4 dedicated resources focusing on specific business unit (asset/ function groups: Rolling Stock, Infrastructures, Operation

Figure 5 – Cycle through Design, Production and Test

Figure 3 – Systems Breakdown of the "Asset Management" Systems of interest

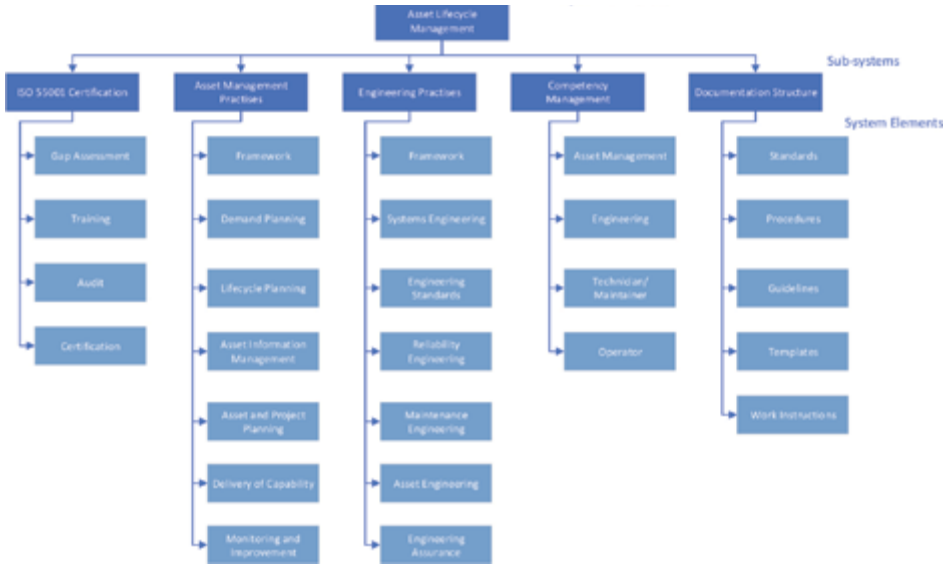


Figure 4 – Systems Engineering Life Cycle Process – Vee Diagram

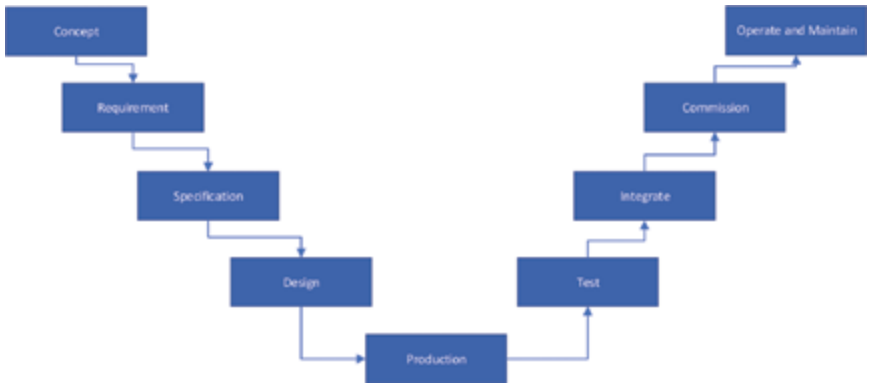
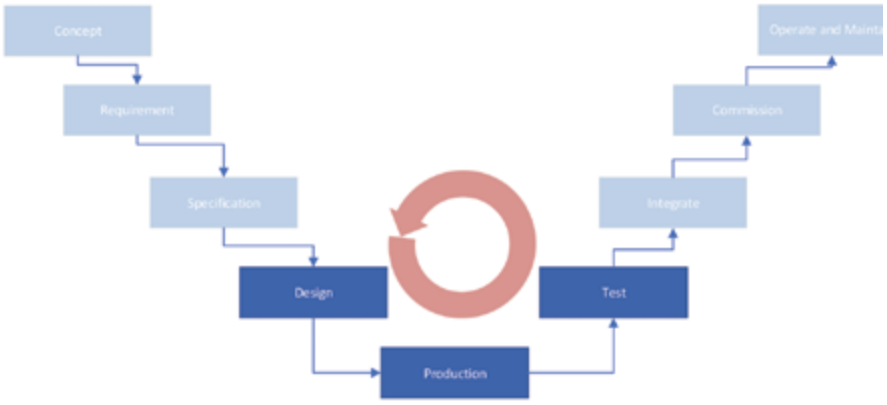


Figure 5 – Cycle through Design, Production and Test



Clause	Item	Requirement	Artefact(s)*
4.1 Understanding the organization and Its context	1	The organization shall determine external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended outcome(s) of its asset management system.	AMSC ToR SAMP Management Review AM RACI
	2	Asset management objectives, included in the strategic asset management plan (SAMP), shall be aligned to, and consistent with, the organizational objectives.	Franchise Agreement Transport Asset Strategy Corporate Plan SAMP AMP
4.2 Understanding the needs and expectations of stakeholders	3	The organization shall determine:	Stakeholder Analysis SAMP AMP
		the stakeholders that are relevant to the asset management system;	Stakeholder Analysis SAMP AMP
		the requirements and expectations of these stakeholders with respect to asset management;	Stakeholder Analysis SAMP AMP
		the criteria for asset management decision making;	SAMP AMP
		the stakeholder requirements for recording financial and non-financial information relevant to asset management, and for reporting on it both internally and externally.	Stakeholder Analysis SAMP AMP

(*AMSC – Asset Management Steering Committee, ToR – Terms of Reference, SAMP – Strategic Asset Management Plan, AMP – Asset Management Plan)

Control and Management System and Projects) implementation activities. The purpose of this activity was to ensure that our AMS is relevant and applicable (V&V), and identify gaps and opportunities in business units' processes, documentations and other activities.

Wave 3 implementation focused on preparation for the certification audit. A series of one-on-one coaching sessions were carried out. The audiences for these coaching sessions are the expected group of members who may be asked to meet with the auditors. These sessions proved to be useful, allowing a dedicated time for focusing the team on preparation for the certification audit.

3. MANAGEMENT SYSTEMS

3.1 Asset Management System

The Asset Management System is divided into 5 Pillars with 13 System Elements as illustrated in Figure 7.

Lead - Set the direction for Asset Management, determining what needs to be achieved, and the internal and external factors that need to be considered.

- The Asset Management System Policy is a short statement that sets out the principles by which the organisation intends to apply asset management to achieve its organisational objectives.
- The Asset Management Objectives define what the organisation aims to achieve by effectively managing
- assets. These Objectives align with the Asset Management Policy.
- The Asset Management Strategy is the approach Yarra Trams has set out to achieve the Asset Management Objectives, documents include the Strategic Asset Management Plan (SAMP), the system manual and Asset Information Management Strategic Plan.
- Requirements and Constraints outline the internal and external requirements and constraints that Yarra Trams must consider within the Asset Management System. Requirements and Constraints influence the Asset Management System and its artefacts.
- Develop – Making evidence-based decisions to inform the Asset Class Strategy.
- System and Demand Planning relates to Network Planning, includes the development of network strategy, in response to direction from the State; planning and improvement opportunities to meet passenger demand and better service our stakeholders; evaluation of risks and

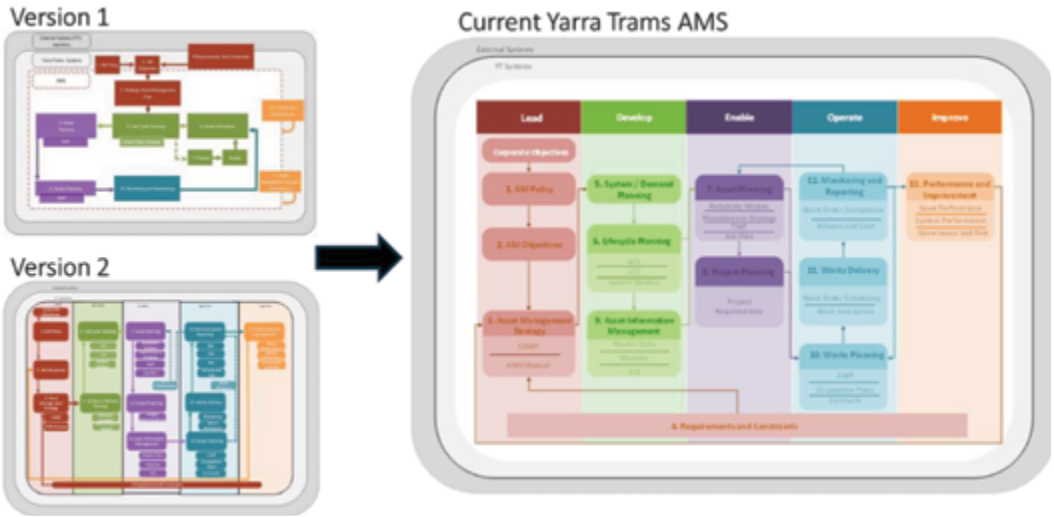
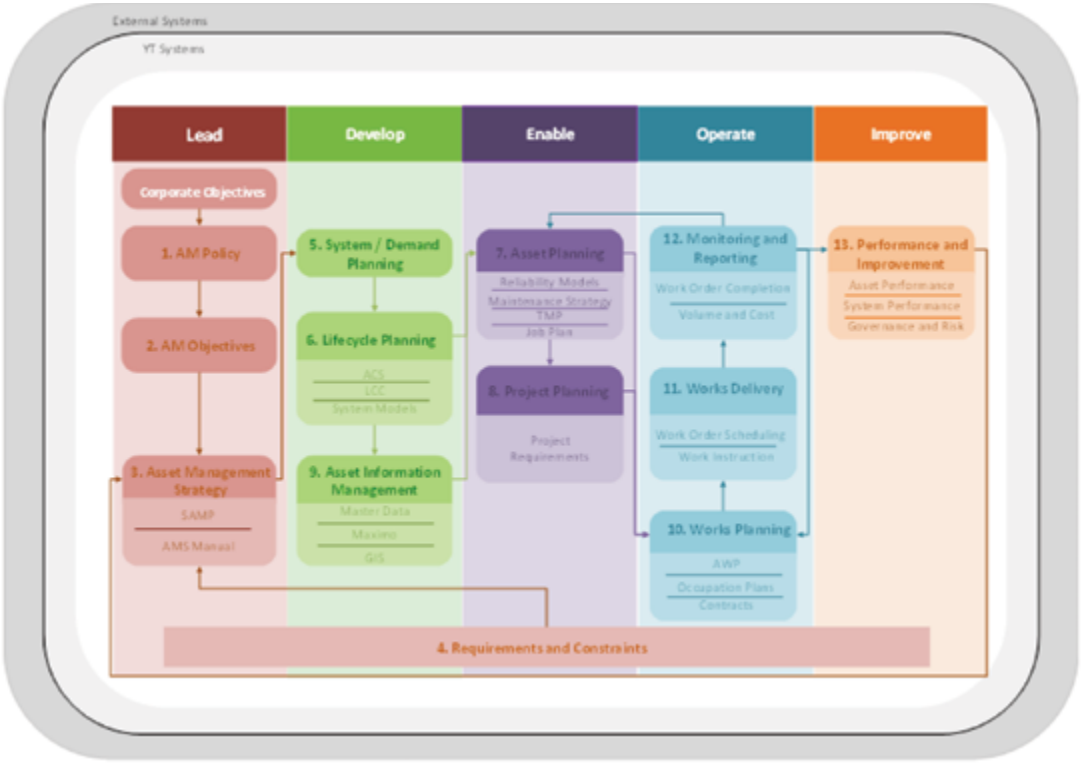


Figure 6 – The evolution of Yarra Trams' Asset Management System applying the V&V principle

Figure 7 – Yarra Trams Asset Management System



opportunities of any proposed network changes; introduction of new trams, technologies, and evolution of timetables

- Lifecycle planning comprises a set of processes and tools to enable optimal management of an asset throughout its lifecycle. The output of lifecycle planning is a set of Asset Class Strategies, developed in accordance with the Asset Class Strategy Standard. Lifecycle planning precedes Asset Planning and Works Planning.
- Asset Information Management comprises standards, processes and guidelines to manage asset-related
- master data, and transactional data.
- Enable – Definition of the planned activities to be performed on the assets to achieve the objectives in an Asset Class Strategy.
- Asset Planning is producing the requirements for asset maintenance, renewal, asset data, and required resources. The process interfaces with Lifecycle Planning as an input, and Works Planning as an output within the Asset Management System.
- The Project Planning element relates to planning asset-related works that are delivered as projects. These include asset renewals and occupations, overhaul/upgrade works, and State-funded projects. These works are governed by the Project Management System.
- Operate – Planning, scheduling and execution of all work on the assets and reporting back to the organisation
- Works Planning is a key process in managing an asset-rich business. It is critical to plan maintenance and renewal works to optimise asset performance and availability.
- Works Delivery is the execution of Annual Works Plans as maintenance and renewal activities (work orders),
- and related enabling processes like planning and coordination, safety management, risk management, and procurement & contract management.

- The Monitoring and Reporting element relates to monitoring and reporting on asset performance and delivery of work described in the AWP. The aim of this element is to ensure work orders are being executed as planned in terms of quality, volume and cost.

Improve – Review and change of the Asset Management System to ensure compliance and continuous improvement.

- The Performance and Improvement element comprises: Asset Management System Performance and Governance and Risk Management.

3.2 Engineering Management System

The Engineering Management System (EMS) went through several iterations. Complimenting the asset management system, it focuses on technical engineering management activities and processes that are common across all engineering practises. The EMS is divided into 5 stages and 11 elements.

Lead – Lead activities are about leading the development of the Engineering Management System, including engineering management policy, objectives and strategy for engineering management, evaluation of stakeholder requirements and communication of the EMS. These are LEADERSHIP roles and processes.

Develop – Develop activities are development focus, including the engineering management approach and implementation plans, creation of standards and specifications, and development of requirements for engineering information. These are STRATEGIC roles and processes.

- Systems Engineering (SE) relates to processes for conceptualising, designing and integrating a system into existence. Systems Engineering activity is about translating user needs and concepts into requirements, specifications, designs, objects that can be tested and finally used as intended.
- Standards and Specification – Yarra Trams is the Engineering Design Authority (EDA) for the Melbourne
- Tram Network. This requires Yarra Trams to develop, review, approve and manage engineering standards.
- Engineering Information describes how data, including master data is managed, governed and controlled. Robust and accurate data enables effective decision making and is the basis of engineering assurance and improvement. This includes data maintained in electronic form as well as documents, manuals and drawings. This is a common element, same as Asset Information within the AMS.
- Enable – Enable activities are about translating strategy into executable plans and processes, focusing on definition of engineering activity, management of engineering change and configuration change, analysis of asset performance and coordination of engineering resources to deliver work These are TACTICAL or PLANNING roles and processes.
- Asset Engineering is the engineering activity performed by engineers to develop and deliver safe, affordable, and practicable changes to existing assets. The changes may be delivered through business as usual activities or via a project (i.e., an activity with a defined timeframe, cost, and deliverables). Asset Engineers perform all scoping and design management tasks, including design review, acceptance, change management, specification and assurance work related to an engineering change. Their work is systems engineering applied to management of changes to the existing assets including the equipment and components we purchase and maintain.
- Reliability Engineering is an engineering discipline that combines statistics, physics and engineering

- practices and is dedicated to the study of the uncertainty of performance over time and performs the analysis of data (asset and work) to understand trends, pain points, common causes, develops changes to maintenance and renewal plans and makes predictions of future performance. An element that is being called upon in the AMS under the Life Cycle Planning, Asset Planning and Monitoring & Reporting elements.
- Project Engineering refers to the engineering activities that are conducted to support the delivery of a project. Project Engineers coordinate the engineering resources within the scope and agreed constraints for a project or program of work.
- Their work is systems engineering applied to the creation of new assets, or significant changes to existing assets always in a project context. This is an element that is referred to and cross reference with the Project Planning element under the AMS and PMS (Project Management System).

Operate – Operate activities are detailed planning, scheduling and supporting engineering activity, coordinating and executing work plans and processes, including monitoring their effectiveness and our efficiency in doing the work. These are OPERATIONAL roles and processes.

- Maintenance Engineering is the activity performed by engineers to sustain the capability of the asset (system) to provide the expected service through the optimisation of resources, practices and people with a view towards maximising asset availability, maintainability, and safety. Maintenance Engineers perform the day to day technical support for the maintenance teams, investigating common cause failures and problems, investigating incidents, advising on specification and selection of parts & tools & resources to perform the task, all with a view towards maximising asset availability and maintainability. Processes and techniques used in this element are called upon in the Asset Planning and Works Planning Elements of the AMS.

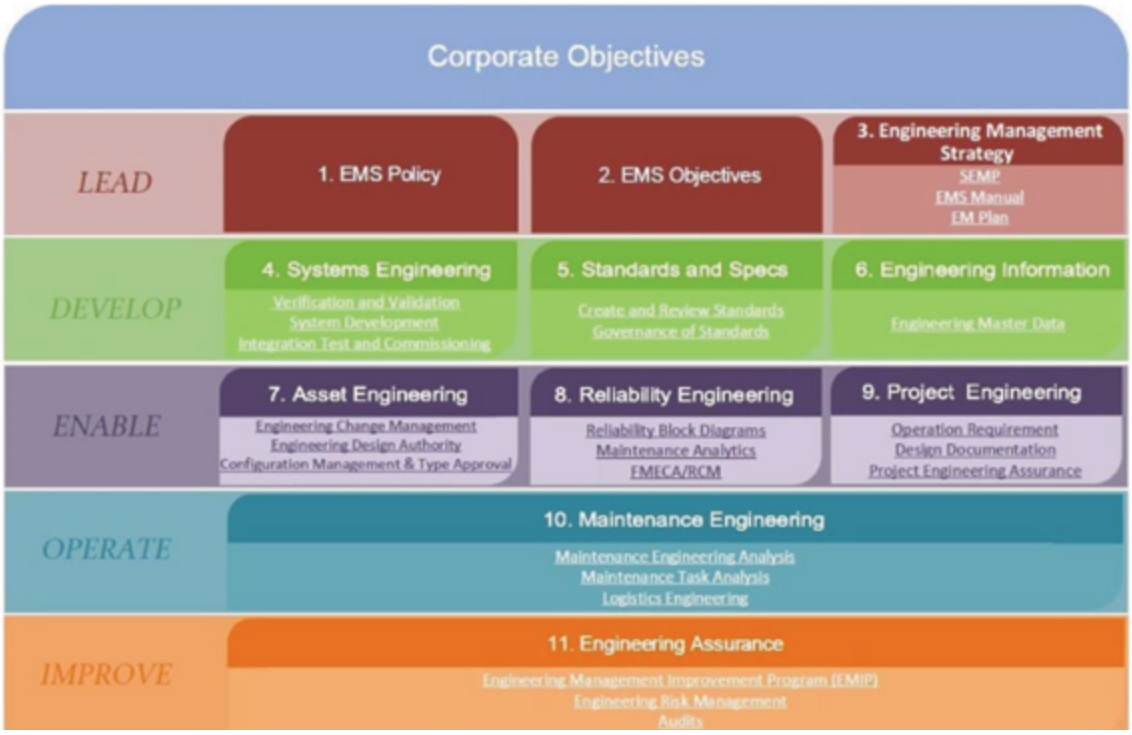


Figure 8 – Yarra Trams' Engineering Management System

Improve – Improve activities are about monitoring the performance of the engineering management system, providing assurance that the system is effective, identifying actions to improve the EMS. These are ASSURANCE roles and processes.

3.3 Integrated Management System

Our approach to integrated management system is to identify common processes across all key managements systems and then decide where it best fit. For Yarra Trams, Safety Management System and Project Management System have been developed and implemented at enterprise level prior to AMS and EMS. The activities we undertook while going through the iteration of systems development are:

1. Identify processes needed for AMS/EMS and review standards:
    a. Asset Management Systems Series (ISO55000, ISO55001, ISO55002, ISO55010)
    b. Systems Engineering Standard (ISO15288)
    c. Application guidelines – Technical and financial processes for implementing asset management systems (SA/SNZ TS IEC 62775, (QR-005 Dependability, 2018))
2. Perform research within enterprise's document management system and share-drives to identify all existing processes and documents
3. Review and rewrite processes, then publish them in enterprise system (SharePoint)
4. Place documents under an appropriate management systems' elements/sub-section.
5. If the document already existing in other management systems and is a common process, we will point the reference to existing management system.

Examples of common processes:

1. Project Planning (AMS) and Project Engineering (EMS) are utilised by the Project Management System
2. Processes and techniques used in Life cycle planning (AMS), such as the suite of processes and tools in reliability engineering are documented under EMS – Reliability Engineering element.
3. Processes and techniques used in Asset planning (AMS), such as the suite of processes and tools in maintenance and reliability engineering are documented under EMS – Reliability Engineering and Maintenance Engineering
4. Asset Information and Engineering Information are consolidated.

4. OUR LEARNINGS

Key learnings from 2 years of intensive Specifications to Commissioning both management systems are: Four "Yes" and Four "No"

- Yes to leadership commitment
    - o Senior leaders commitment are pivot to success. We have support from CEO and all executives, which are needed for a successful certification outcome
- Yes to centralised approach
    - o Several attempts to AMS at various business function levels prior to MR4 has seen that a management system will be best done at enterprise level. This leads to a conclusion for centralised approach. This is also proven to be more efficient and effective.
- Yes to training and competency development
    - o Uplifting awareness and competency are pivot to AMS implementation success. The processes and documents written will need to be used by staff who understand and appreciate the need of these processes. By providing training and competency development increase the overall maturity of the organisation in understanding and apply asset management processes.

- Yes to integrated management system and change management approach
  - o Integrated management system approach is found to be beneficial to the design and implementation of AMS. Applying change management principle, it is found to be more engaging when similar processes are not repeated and be applicable across management systems.
- No to silos
  - o Silos development of AMS and EMS processes lead to inefficiency and confusion. Generic processes such as life cycle planning and engineering change are common and should be done in a similar manner within an enterprise.
- No to reinventing the wheel
  - o If the processes exist, review and use them.
- No to confusing terminologies and understandings
  - o In the implementation of AMS, it is found that definitions are very important. It is also critical that definitions come from proper source and published papers or knowledge hub such as (Asset Management Council, n.d.)
- No to change fatigue
  - o It is found that the business will not be able to concurrent implementation of different change and management systems. A balance of changes implemented and a coordinated approach to change is found to be very beneficial.

5. BEYOND CERTIFICATION

Our next focus is to strengthen the effectiveness of the Asset Management System and Engineering Management System by embedding them within the business. Our journey to asset management excellence has just started and one key aspect to success will be further enhance our integrated management systems approach, in particular with Asset Management and Systems Engineering practises.

6. REFERENCES

[1] Asset Management Council, n.d. AMBok Glossary. [Online]

Available at: http://amcouncil.com.au/knowledge/asset-management-body-of-knowledge-ambok/ambok-glossary.html

[Accessed 6 Feb 2020].

[2] ISO/IEC JTC 1/SC 7 Software and systems engineering, 2015. ISO/IEC/IEEE 15288:2015 Systems and software engineering — System life cycle processes, Geneva: International Standard Organisation.

[3] ISO/TC 251 Asset management, 2014. ISO 55001:2014 Asset management — Management systems — Requirements,

Geneva: International Standard Organisation.

[4] Keolis Downer Yarra Trams CEAM, 2017. CEAM Business Plan, Melbourne: Yarra Trams.

[5] QR-005 Dependability, 2018. SA/SNZ TS IEC 62775:2018 Application guidelines - Technical and financial processes for implementing asset management systems, Geneva: Standards Australia.

ARTICLE 3 – Using Asset Criticality to build a Planned Maintenance Program

Shenan Daniels & Paul Davis

Summary: This paper will explore the use of Asset Criticality as a tool to build a Maintenance Strategy, leading to the establishment of a Planned Maintenance Program that enables a consistent approach to manage a wide portfolio of infrastructure assets. Critical assets at TasWater, are those which have the potential to incur severe consequences and/or impede business objectives, should they fail. Adopting a criticality-based approach ensures that low criticality assets are not excessively maintained, and high criticality assets are not under-maintained. Asset Criticality has been used to develop TasWater's Maintenance Strategy that provides a consistent state-wide approach to planned maintenance activities while allowing time for TasWater to move to a more mature maintenance strategy. Fundamentally the implementation of a Maintenance Strategy based on asset criticality supported the development, management and optimisation of a Planned Maintenance program, consistent with the aims of TasWater's Corporate Asset Management Policy and Plans.

Keywords: asset, criticality, planned maintenance (PM), maintenance, strategy, TasWater (TW), function, failure, relatability, preventive, predictive

1. INTRODUCTION

The 2013 formation of TasWater presented an asset management challenge on several fronts. The amalgamation of four separate sewer and water corporations lead to a diverse range of asset maintenance management practices being in use across multiple sites and with varying degrees of implementation, completion and reporting.

This combined with an asset portfolio of varying age, condition and available information, lead to a rapid increase in asset failure and a corresponding amount in corrective maintenance. To develop a planned maintenance strategy that would provide a consistent and measurable outcome across all asset classes. The use of asset criticality became the cornerstone of asset planned maintenance management at TasWater.

This case study will explore the use of asset criticality and how it can be used to develop a planned maintenance strategy and program that can not only achieve asset management outcomes, but also further extent asset maintenance practices to more advance practices such as FMEA and RCM, as asset knowledge increases.

2. AFFILIATIONS

Shenan Daniels is employed by TasWater as a Planned Maintenance Program Officer.

Paul Davis was employed by TasWater as Manager Pumping and Asset Performance. Now employed at Tasmanian Irrigation.

3. BACKGROUND

3.1 TasWater

TasWater (TW) commenced operations on 1 July 2013 and was formed through the amalgamation of the four Tasmanian Water and Sewerage Corporations:

- Ben Lomond Water
- Cradle Mountain Water
- Southern Water, and their shared services firm;
- Onstream

From commencement, TW has been owned by Tasmania's 29 councils, with the State Government also becoming a shareholder in early 2019 (TasWater 2020).

TW's asset portfolio consists of 151 treatment plants, 300 dams, 930 pump stations as well as over10,000km of sewer and water network mains (Figure 1).

Through the early development of an Asset Management policy and plan, TW recognised the need for improvement in its maintenance management. This has led to the inclusion of the strategic initiative (5.3.2) to 'develop a preventive maintenance program' being established as part of the 2016-18 corporate plan (TasWater 2016).

Figure 1 – TasWater Asset Portfolio (TasWater 2019)

TW is starting from a relatively low level of maturity in maintenance management, combined with an asset portfolio of varying age, condition and available information. Understanding this current state allowed for the realistic development of a maintenance strategy that looked to improve asset function and reliability through to the maintenance planning and execution. 3.2 Defining Criticality

When determining the criticality of an asset it is important to firstly define criticality. Primarily the criticality of an asset is determined by its consequence of its failure. It is possible that an asset can be critical (to the business) but have a low criticality. For example, you may have one pump in a system making it critical to a process but have in place several redundancies or backups, these can lower the criticality of that pump. If it fails, redundancies start up and the process is maintained (low failure consequence). Keeter (2019) expands on this, where an asset can be critical but have a low criticality and that;

"criticality is a function of probability and consequence of failure".

Where an assets probability or consequence of the failure can be changed so can the criticality. Whereas how critical an asset does not change unless another more essential item or process is installed into the system.

The International Infrastructure Management Manual (IPWEA 2015) also uses probability and consequence of failure in defining critical assets as:

"Those assets which have a high consequence of failure (but not necessarily a high probability of failure); those which are most important for delivering the required service".

The International Standard covering the management of physical assets (ISO 55000,2016) defines critical assets as "Those assets having the potential to impact an organisation's objectives".

As TW is a primarily a service industry the definition used by TW for criticality is:

"Those assets which has a high consequence of failure (but not necessarily a high probability of failure); those which are the most important for delivering the required service and business objectives."

The criticality framework developed by TasWater based on this definition is to provide a consistent understanding and approach across the business for establishing the relative importance of assets across numerous asset hierarchical levels and across asset classes.

3.3 Asset Criticality at TasWater

In 2015 TW went through a review process to determine asset expenditure and development across its wide asset portfolio. Two separate reports concluded 'Asset Criticality' presented an opportunity to the business to improve its capital and maintenance expenditure processors.

In the independent appraisal provided to the Office of The Tasmanian Economic Regulator (OTTER) (GHD 2015) the following improvement opportunity was recommended:

- Criticality assessment at all levels to determine priorities for:
  - o System Strategies and
  - o Asset Management Plans
  - o Asset Class Plans
  - o Assets
  - o Asset Data Condition Assessment.

In 2015, a separate project was also completed, delivering a TW-wide Priority Information Needs and Data Quality Assessment (AECOM, 2015). This project identified 'Asset Criticality' as the second highest priority data gap that must be addressed within TW. The report stated that:

"…there is neither a clear definition nor a systematic method for applying criticality within TasWater presently. It has largely been applied in an ad-hoc manner".

Without a clear view of criticality, the report stated that TW is currently not well-placed to ensure appropriate decision making is made in relation to our assets. In the absence of a criticality framework, the report indicated that we cannot currently:

- Ensure that valuable resources are used in the most important areas of the business
- Develop broad level strategies (e.g. strategies for 'avoid fail' assets),

Figure 2 – Asset Criticality Asset Sheet (P. Davis 2016)

Site	Process	Asset	Component	Financial	WHS/Staff Wellbeing	Public Health	Customer Service Delivery/Supply Interruption	Environmental	Compliance and Legal	Reputation	Management Effort	Criticality Score	Criticality Banding
Water Treatment													
Bryn Estyn WTP		Chlorine Gas Disinfection - Shut Off Valves		2.50	17.75	20.50	5.08	N/A	7.81	3.75	3.75	61.14	6 - Special
Huonville WTP		Control Systems-PLC		5.00	0.00	9.38	8.03	N/A	5.45	3.75	3.75	33.85	5 - Very High
Bryn Estyn WTP		Alum Dosing		2.50	8.00	5.50	8.09	N/A	2.50	2.50	1.25	28.83	4 - High
Huonville WTP			Chemical Dosing - Coagulant Dosing Pumps	2.50	0.00	1.16	2.93	N/A	0.37	2.50	2.50	11.21	2 - Low
Bryn Estyn WTP		Inlet Pump		7.50	0.00	0.00	2.56	N/A	0.00	0.25	0.25	10.56	2 - Low
Tunbridge WTP	Sludge Handling			7.50	0.00	0.00	1.00	N/A	0.00	0.25	1.25	10.00	2 - Low

- Undertake optimised decision making
- Manage risk in many areas of the business (e.g. asset planning, works planning, maintenance regimes, spares management etc)

The outcome of this review lead to the development of a TW asset criticality framework, that provided a consistent understanding and approach across the business for establishing the relative importance of assets across several asset hierarchical levels. The ranking of critical assets provided the decision-making tool to improve and determine levels of planned maintenance and operational activities.

3.4 Criticality Framework

The criticality framework used to assign TW asset criticality factored in eight weighted attributes (Figure 2) that account for internal and external influences on the asset failure's consequences. The weightings assigned can be subjective (environmental impact /customer service) it was expected that once established they should not vary unless there are significant changes to the configuration of the assets.

The scoring assigned to the attributes was determined from a mixture of previous experience, knowledge of the treatment process/assets/components and where possible, consultation on site with operators and maintenance staff.

This ensured that knowledge of plant configuration and previous experiences of failures and their consequences was accommodated in the assignment of criticality. A second outcome of this process gave ownership of the issues to the operators and future. This was key to influencing the successful completing rate of future work orders produced from this process.

The criticality assessment can be broken down from a site level to (function/process) to an infrastructure asset level within each of the sites (Figure 2) exposed to this assessment. With TW maintaining over 100 individual treatment plant sites when a high level of assessment determined that there was a low criticality no further assessment was done on the next functional levels. Figure 3 outlines this process. The final weightings delivered the criticality score which then help determine the level of planned maintenance required of for each of the asset at this site. Note that since the development of the scoring bands "6-special" category is no longer part of the framework.

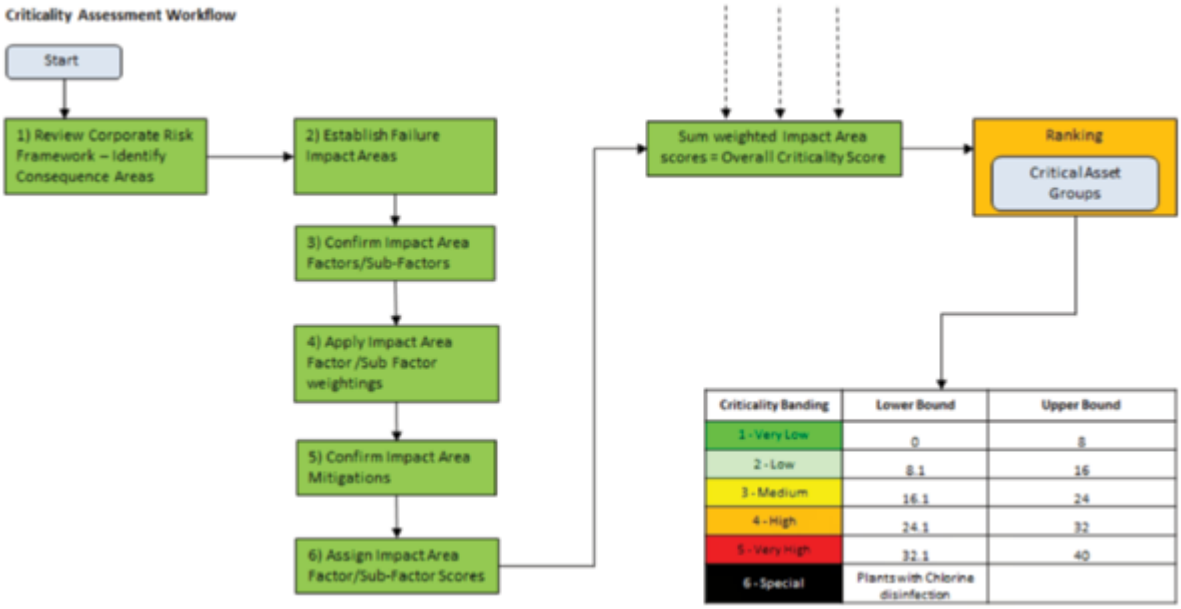


Figure 3 – Criticality assessment workflow (P. Davis 2016)

4. CRITICALITY BASED MAINTENANCE STRATEGY

TW's asset management goal is to maximise planned maintenance and minimise unplanned maintenance (TasWater 2016). Planned maintenance is more cost-effective in most situations because it is performed on a non-emergency basis, is coordinated with other system operation activities, and provides more opportunity to value engineer activities during the planning process (Palmer 2006).

The purpose of the TW Asset Maintenance Strategy (AMS) is to support the development, management and optimisation of a Planned Maintenance (PM) program, consistent with the aims of the Asset Management Policy and Plan (TasWater 2016), that:

- Maintains long term asset reliability and function
- Ensures expenditure is prudent and efficient
- Defines triggers for intervention outside the PM parameters

The Strategy is intended to be applicable across TW assets to support decision making in relation to the lifecycle management of the asset and support the achievement of defined business objectives.

At the time of developing and implementation of the AMS, TW's knowledge of failure modes, risk profiles of its large asset base (> 500,000 maintainable assets) was immature and the ability to quickly measure and determine Planned Maintenance (PM) requirements using the criticality framework lead to TW's adopting a criticality-based approach.

The outcomes of the AMS and on flowing PMs were to ensure that low criticality assets are not excessively maintained, and high criticality assets are not under-maintained. Leading to a consistence approach to maintenance management of like assets within an asset class. With increasing maturity in asset information including; failure history and condition data, these would then impact on the design of maintenance programs developed for each asset class.

The framework and methodology are intended to be applicable across TW to support criticality-based decision making, related to the lifecycle management of the assets that support the achievement of defined business objectives, and a resulting targeted maintenance strategy.

4.1 Applying Criticality to a Maintenance Type

For this report a 'Maintenance Type' is a larger program of tasks. This could be Reliability Centred Maintenance (RCM), Predictive Maintenance (PdM), Preventive maintenance (PrM) and Run to failure (RTF). None of these Maintenance types are precluded

from the introduction of the overarching maintenance strategy of using criticality to determine what activity is required. The maintenance task is the end activity usually performed by the Operator/Maintainer.

TW's primary rule for the development of individual maintenance activities was that maintenance will be targeted to assets which are analysed to be of a high criticality, whereas those assets deemed to be of low criticality will typically have a reduced maintenance intervention (S Daniels 2017)

Table 1 outlines the criticality rating and the giving maintenance activities and task that could be assigned to that asset with the giving criticality rating.
Internal and external consultation and experience, industry standards and operations and maintenance manuals all contributed to the development of the categories of maintenance tasks applicable the asset criticality levels (Example Figure 4). These tables were developed for each of the major asset groups that TW own and maintained, listed in Table 2.

Figure 4 outlines the maintenance requirements for pumps. The figure shows that as the criticality

of the asset increases so does the maintenance requirements. Left to right on Figure 4, show the applicable maintenance activities that could be done on this asset and point of renewal (maintenance is ineffective) of the asset. There is no requirement in the strategy to say that one type of maintenance is applicable over another. This can come down to decision made about the individual asset and the cost/benefit of each type of maintenance.

Once the decision has being made about the asset criticality the maintenance program then can be built and run within TWs CMMS system from the information supplied in Figure 4.

5. CASE STUDY: CRITICALITY APPLICATION

Table 1 – Planned maintenance criticality ratings (Author Own 2020)

Criticality Rating	Maintenance Type	Maintenance Task / Reason
High	RCM	• Range of programs • Condition monitoring, inspections, remote monitoring • Aimed at reducing known failures Programs to the individual asset
	Pdm	• Thermal imaging, alignment testing, oil analysis, bearing testing (continuous) • When reaches a defined criterion, then do required maintenance • Applied to other like assets
Low	PrM (low failure history)	• Follow O&M Manual requirements • Regularlubrication program (state- wide/regional possibilities) • Instrumentation calibration (state-wide/Inline handheld) • Roll out on similar assets.
	RTF	Spares available (no PM required)

Figure 4 – Maintenance categories for submersible pumps (S. Daniels 2017)

Criticality	Planned Predictive	Planned Preventive	Unplanned	Mitigation	Renewal
	Category	Category	Type	Type	Type
1	Performance monitoring: instrument based monitoring, yearly	Service and replenishment: manufacturer timing	Repair on failure	Spares: order on failure	When failed and end of RuL
2	Performance monitoring: instrument based monitoring, yearly	Service and replenishment: manufacturer timing	Repair on failure	Spares: order on failure	When failed and end of RuL
3	Performance monitoring: instrument based monitoring, yearly	Service and replenishment: manufacturer timing	Repair on detection of major issue(s)	Spares: critical spares held on site	Condition Grade 5
4	Performance monitoring: instrument based monitoring, 6 monthly	Service and replenishment: exceed manufacturer timing	Repair on detection of major issue(s)	Redundancy: immediate if practical	Condition Grade 4
5	Performance monitoring: instrument based monitoring, 6 monthly	Service and replenishment: exceed manufacturer timing	Repair on detection of major issue(s)	Redundancy: immediate if practical	Condition Grade 4

TO THE PLANNED MAINTENNCE PROGRAM

To roll out the new maintenance strategy across the stare the, Planned Maintenance Optimisation Project (POMP) was initiated. The case study was undertaken through TasWater's Planned Maintenance Team utilising TasWater's criticality framework. With the sewage pump stations in the North of Tasmania having their criticality assessed to TasWater's corporate objective, several assets were identified as being maintained above the requirement based on the consequence they pose to the business. A total of 170 assets were reviewed and frequencies reduced to meet the requirements of the planned maintenance strategy. Table 4 summaries a review of the SPS PM regime across several SPS sites.

Sewer pump station PM programs had not been revised since TW implementation, and no to little details of why program was set up like it was or what tasks were required by the programs where available. They were a lot of "that is just the way it has been". The result of this was field operators going out, preforming tasks with no realistic outcomes or knowledge of why the tasks were being performed. Several programs were designed around trying to overcome random failure events that happen with the network (foreign material blockages). Resulting in every increasing failure rate on the SPS, not matter what PMs where taking place. Existing PMs programs were stopped and revised for task and frequency and the new PM developed, listed targeted activities and inspection frequencies, built around known failures types and rates of failures.

Table 4 shows some Planned Inspections went from weekly (1W) to fortnightly (2W) even 4 to 12-week intervals.

In developing a PM program that was targeted and reviewed by criticality. The result of this work yielded a reduction in operational spend of 75.7% coupled with a reduction in corrective maintenance events (seem from red line) (Figure 5). This delivered TasWater a sustainable operational expenditure saving of approximately $42,000 per month across 170 sites in preventive maintenance allowing repurposing of labour to other tasks. This augmentation of PM frequencies also reduced call outs to SPS reducing exposure to unsafe work environments.

An encouraging result. The developed of the PM criticality

Table 2 – Asset groups (S. Daniels 2017)

Civil and Structural	Mechanical and Electrical	Instrumentation, Control and Automation
Concrete Vessels - Aeration Basins, Clarifiers, Wet Wells, Settling Tanks, Thickeners, Digesters	Mechanical Screens	Water quality analysers (DO, pH, Cl, conductivity, temperature, turbidity).
Non-Concrete Vessels and Storage Tanks	Chemical Dosing Pumps, Submersible Pumps, Dry-mounted Pumps / Aeration Blowers / Compressors	Gas Analysers (Cl, H2S, etc).
Lagoons, Dams, Ponds	Surface Aerators / Submerged Mixers	Flow Meters.
Piping and Fittings	Settling Tank and Clarifier Mechanisms / Scrapers and Rakes / Trickling Filter / Scum Collection etc.	Non-Contact Instrumentation (e.g. radar / ultrasonic level detection).
Filter Media	Relief Valves	Contact Instrumentation (level switches, pressure switches, etc.).
Access stairs, walkways etc.	Actuators / Rotorks / Penstocks / Flow Control Valves	MCCs / VSDs / Other electrical installations.
Pump Stations Water and Sewer	Dewatering Equipment and Solids. Handling/Conveyance (includes gravity table, belt filter press, centrifuge, auger, lime silo and feeder)	Water Meters.
Network Assets	Air diffuser manifolds and caps	
Pits, pipes, maintenance holes, valves, connections, scours	UV System	
Heat Exchanger / Boilers / Waste Gas Burners		
Chlorinator / Chlorine gas system		
Membranes and panels		
Hydrants, Valves, Mag-flow		

Table 3 – SPS PM Review (Author own 2020)

		NEW PM PROGRAM						OLD PM PROGRAM			
SPS	Criticality	1W	2W	4W	12W	26W	52W	1W	12W	26W	52W
BFP01	2		*				*	*	*		*
BYP01	4	*					*	*	*		*
BYP02	4	*					*	*	*	*	
BYP03	1		*		*		*	*	*		*
BYP04	4		*				*	*	*		*
BYP06	2		*				*	*	*		*
ETP01	3	*					*	*	*		*

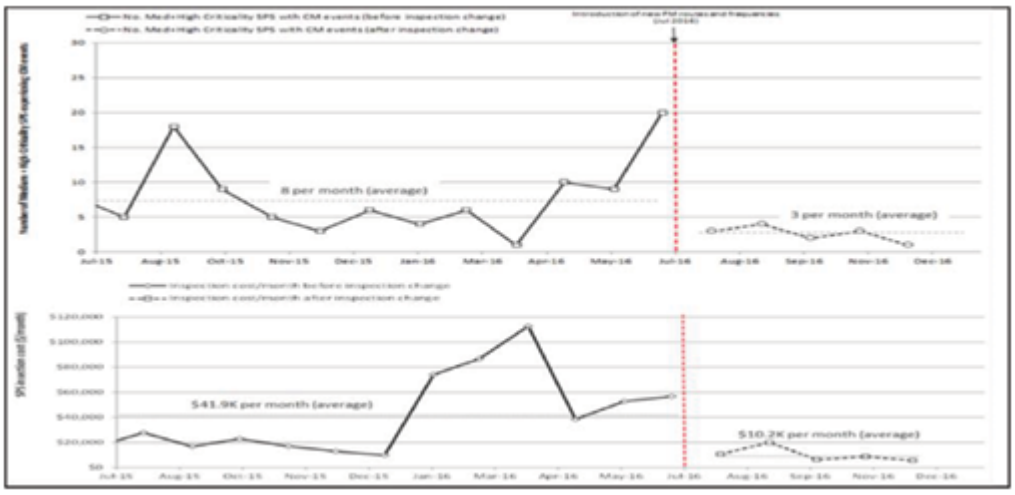


Figure 5 – SPS Criticality and PM changes (M. Rippon et al 2019)

process and review for sewage pump stations and other asset classes now allows this process to be rolled out across the entire asset based including TasWater's 780+ sewage pump stations. Improve in the data management have also allowed for future improvements by actively tracking interventions

6. KEY LEARNINGS

From the initial work done on building of the new PM programs against asset criticality to the end work orders produced within the CMMS system TW continued developing the process from a number of observations and learnings.

6.1 Operator / Maintainer Influence

From the start of the process it is important to have buy-in from the Service Delivery Department. Developing a collaborative approach with the operators and maintainers, to any changes within a maintenance managed system, is critical to an

improvement in asset reliability and management. Involvement of the Service Delivery area of the business can give a sense of ownership of the new tasks which intern and leads to a higher completion rates of the required programs. Leading to increasing the chances of a positive outcome for any asset management outcomes.

6.2 Long Term Focus

Setbacks will happen. Expect early failures in the development and implementation of this process. Continual refinement and improvements to the activities undertaken is key to successful outcomes. The business must focus on the longer-term benefits of changes to a Planned Maintenance program. Early focus of the business may be on the initial cost reduction (Figure 5) due to PM frequency changes but as with all PM program the real productivity benefits including:

- Reducing maintenance costs
- Improving Useful Equipment Life.
- Increased Productivity
- Increase Residual Values
- Enhance Facility Safety (Toyota 2015).

Are the focus of a long-term output and outcomes to the business.

6.3 Product Quality and Criticality

Producing reliable and safe drinking water (customer service impact) is the key function of the business. Assets can be susceptible to failures can be where the asset is in an acceptable state, but the product being produced (safe drinking water) has become unacceptable. PMs can be established to reduce incidents of product failure. Maintenance types of scouring, flushing, sewer cleaning and odour control fall into this category. The establishment and frequency of the programs are independent of the asset condition and are based on preventing further product failure to the customer. Application of criticality on these types of programs becomes secondary and details for the establishment of such programs will come from product quality and the asset class plans directly.

6.4 Asset Condition

Asset condition is a measure

of the health of the asset. The condition of an asset can deteriorate leading to an increase in the likelihood of functional failures of the asset It is a key parameter in determining the remaining useful life of the asset. There are several factors that can affect an asset's condition or performance (LGAM 2016). These can include:

- The asset's age
- The asset's environment (what weather etc. it is exposed to)
- The asset's maintenance history (maintenance in the past)
- The utilisation of the asset.

The maintenance strategy is based on asset criticality. Where an assessment of asset condition is made on an asset, this will determine level of maintenance effort applied to the asset. Examples of program adjustments based upon criticality are shown in Figure 4. With the deterioration of an assets condition, changes in the planned maintenance program is required. Where the condition of an asset deteriorates to a point where a maintenance program is no longer able to maintain that asset's reliability and function, or the cost of maintaining the asset is not justifiable when compared to the replacement cost of the asset, the asset should be considered for renewal or replacement. Asset condition is also an indicator of how well the asset can perform its function.

7. CONCLUSION

The developing of a criticality profile across TW asset based is the first step in the journey to a well-defined data backed asset maintenance management system. Implementing asset management models of FMECA and RCM require high levels of dedicated budgets and can be resource consuming. Where a business has a limited budget and resources the ability to use asset criticality as a tool to review and improve a planned maintenance program, can provide a justifiable methodology. In developing a planned maintenance strategy that is based on asset criticality, this is the first step to being able to build more detailed mature asset maintenance management strategies.

In a funding-constrained environment, assigning maintenance funding requires a means of identifying the relative importance of various assets to the achievement of business objectives. Understanding asset criticality helps solve this problem. TW has provided a process that provides a consistent and measurable outcome across all asset classes.

8. REFERENCES

[1] AECOM 2015, Priority Information Needs& Data Quality Assessment Final Presentation Rev 1 [Internal] HPRM: A15/16417

[2] Daniels S 2017 TasWater Maintenance Strategy Version 1 [Online] https://intranet.corp.taswater.com.au/Connect/IMS/Asset-Management/asset-management-system (accessed December 2019)

[3] Davis P 2016, Asset Criticality Framework Version 1 [Online] https://intranet.corp.taswater.com.au/Connect/IMS/Asset-Management/asset-management-system (accessed December 2019)

[4] GHD, 2015 Independent Appraisal of TasWater's Asset Management Plan – Final Report August [Internal] HPRM: 15/180731

[5] IPWEA 2015, International Infrastructure Management Manual, International Public Works and Engineering Australasia, Australia

[6] ISO 55000, 2016 Standards for Asset Management [Online] http://www.assetmanagementstandards.com (accessed April 2016)

[7] Keeter B 2019, Priority vs Criticality [Online] https://reliabilityweb.com/articles/entry/priority_vs_criticality/ (accessed December 2019)

[8] LGAM 2016, Local Government Knowledge Base-Asset Condition [Online] http://www.lgam.info/asset-condition (accessed May 2016)

[9] Palmer D 2006, Maintenance Planning and Scheduling Handbook, McGraw-Hill

[10] Rippon M, Davis P, Daniels S 2019, 'Data Visualisation – the New Currency of the Water Industry' International Public Works Conference 25-29 August. Hobart: Institute of Public Works and Engineering

[11] TasWater, 2019 TasWater Corporate Plan 2020-2024 [Online] https://intranet.corp.taswater.com.au/Connect/Resources/Corporate-Financial-and-Long-Term-Strategic-Plans/corporate-plans (accessed December 2019)

[12] TasWater, 2016 TasWater Corporate Plan 2016-2018 [Online] https://intranet.corp.taswater.com.au/Connect/Resources/Corporate-Financial-and-Long-Term-Strategic-Plans/corporate-plans (accessed December 2019)

[13] TasWater, 2020 Who is TasWater. [Online] Available at: https://www.taswater.com.au/About-Us/Who-is-TasWater (accessed January 2020)

[14] Toyota 2015, Five major benefits of planned preventive maintenance [online] https://www.atlantaforklifts.com/news/206.php (accessed January 2020)

ARTICLE 4 – Stakeholder Engagement Across a Diverse Asset Portfolio – Our Journey so Far

Shenan Daniels & Paul Davis

Summary: Understanding the needs of stakeholders may seem like a straight-forward exercise with the typical approach considering cost, return on investment and levels of service. However, when one peels back the surface layer, there can be complex dynamics in place.

Many organisations operate within a small number of asset portfolios. For Gladstone Regional Council (GRC), there are 10 major asset portfolios, of which seven are within the Asset Management System. These include Water, Wastewater, Drainage, Transport, Waste, Property (Land and Buildings) and Parks. The stakeholder analysis quickly becomes complex when identifying the key parties across each portfolio when they may relate to one or more service; additionally, individual stakeholders' needs may differ across multiple categories.

Further challenges are presented when collating the different points of contact and associated communication lines between GRC and the relevant stakeholders in order to operate in respect to existing interactions and requirements. This paper looks to address the approach taken by GRC to identify internal contacts with external stakeholders, how external stakeholders were identified, engagement activities with external stakeholders, lessons learnt and activities to maintain the understanding of stakeholder needs.

Keywords: stakeholder, engagement, portfolio, expectations, complex.

1. INTRODUCTION

Gladstone Regional Council (GRC) was formed on 15 March 2008 through amalgamation of the former Gladstone City Council, Calliope Shire Council, Miriam Vale Shire Council and the Gladstone Calliope Aerodrome Board. Since then, the population of the region has grown to 63,000 residents and 3,500 businesses. The Gladstone region is a growing residential location, with significant rural, rural-residential and industrial allotments encompassing a total land area of approximately 10,500km2. Within this space, the region boasts an attractive combination of national parks, state forests, coastline, beaches and islands.

Gladstone is the urban centre of the region, with numerous surrounding townships including Agnes Water, Baffle Creek, Benaraby, Bororen, Boyne Island, Boyne Valley, Calliope, Miriam Vale, Mount Larcom, Rosedale, Seventeen Seventy, Tannum Sands and Yarwun. Major industries operating within the region include an alumina refinery, an aluminium smelter, a power station, gas plants and port facilities. Rural land across the region is mainly utilised for cattle grazing with grain growing, fodder cropping, and timber and tropical fruit production also operating. Together these industries represent 1.5% of Qld's Gross State Product. As a result of the varied economic factors, GRC has a diverse range of stakeholders to service across a diverse asset portfolio.

Bringing these two elements together in an effective manner is a commitment that GRC is making a priority. Through the implementation of an Asset Management System, GRC intends to gain consistency and alignment of decision making.

2. STAKEHOLDERS

2.1Identification

GRC's stakeholder activity commenced with General Manager engagement sessions to provide context of the project's intent and seek support from them and their teams. This session also sought out key internal contacts for separate engagement to identify the key organisations that each department worked with across each of the portfolios to understand what we already knew about out stakeholders.

When working with the identified internal stakeholders it was important to convey the intent of the activity as well as how it could benefit their team. We also utilised this time to identify who the major external stakeholders were from their perspective and which of their staff were key contacts. This was then followed up to gather detailed information on contact points and areas of engagement. Whilst collating this information, consideration was given to the management of contact details and respecting the existing business relationships in place. In undertaking

this activity, it provided a top down view of the existing stakeholder relationships.

This information then fed into the initial brainstorming activity to provide a holistic view of the business's current stakeholders. This activity also presented additional avenues for internal and external relationship building. For the Water portfolio for example, the top users were identified based on consumption data.

An element that required strong consideration was stakeholders with interests across multiple asset portfolios, such as an industrial plant being major stakeholders in Transport, Water, Waste and Wastewater asset portfolios. As the activity progressed, there were scenarios where single organisations had multiple GRC internal contacts, highlighting the benefit from these relationships to be mapped. Although this was a challenge, it was welcomed by staff for visibility purposes and the opportunity for streamlined communication processes.

2.2 Domestic and "non-domestic" stakeholders

GRC has a routine customer satisfaction survey that provides valuable feedback on the community's position. These studies don't necessarily capture the organisational needs of our stakeholders. However, with the diversity of the region, different lenses were required to cover feedback from the various organisations in the area. Understanding that there are differing factors that attribute to community and organisation satisfaction identified two clear types of stakeholder groups for attention.

The focus on this engagement was to capture 'non-domestic' stakeholders; those that, whilst a community member, had an operational focus within the region. This covers a range of categories including industry, education, sporting, health and business groups. Those stakeholders involved in GRC's supply chain were excluded from this exercise as the needs and expectations under the business agreement are covered under the contractual obligations in place.

2.3 Domestic and "non-domestic" stakeholders

When planning the scope of each engagement activity, GRC focused on relationship building as a priority. Although information sourcing is vital to support GRC services, by fostering relationships with the stakeholders, the information required becomes a valued product as opposed to a driver.

Activities identified for undertaking were customer satisfaction surveys, focused online engagement activities, consultation and face to face meetings. Further to face to face meetings, attendance to specific events was also completed to gain better insight to community perspectives. By attending appropriate events within the region, the opportunity for the community to share their feedback is strengthened. For GRC, these events include local markets, pop up stalls and festivals. Each of these methods were specifically reviewed for suitability across the target audience and intent for the engagement. It was important that the selected method was able to deliver to anticipated outcomes.

With the direction in place, a review of the existing stakeholder engagement activities across the business was undertaken. The existing practices gave a channel for community feedback into the business for a range of topics however an improvement opportunity was identified to receive feedback on asset-based existing services.

The ultimate position from these activities is to gain an understanding of services the stakeholders want, need and can afford. During planning of these activities, timing of the engagement in proximity to Councillor elections was noted and decided to focus on the asset base service levels without affordability.

Factoring the varied stakeholder groups, portfolios and interests, the engagement was not suited to a one size fits all standard set of questions. To achieve the best value from the engagement activities, the questions were customised per stakeholder group and asset portfolio. Through interest mapping, focused questions and a considered approach for each stakeholder group, the business had an appreciation for the engagement activity.

3. EXTERNAL FACTORS FOR CONSIDERATION

There were many factors outside of the project's control that needed to be considered. These may not have necessarily influenced the answers but required awareness:

- **Councillor elections –** Being cognisant of the local Councillor elections and how a survey like this could be interpreted. Engaging on affordability has been delayed as not to cause any undue concerns or perceived bias.
- **Environmental scenarios –** Scenarios such as bushfires and water restrictions require sensitivity to the impact that these topics might have had on the stakeholders. Engaging at a suitable time is required to obtain true responses outside of heightened situations at hand.
- **Survey timing –** Awareness of the engagement timing with respect to wider Council activities.
- **Contentious projects (accepted or rejected) –** With the nature of the projects managed within Council, both accepted and rejected, awareness of the impact these decisions may have had on the stakeholders and their perception of GRC is required.
- **Townships within the region –** As a geographically diverse region, the interests of all areas within the region are at the forefront and not just Gladstone itself.
- **Cultural groups –** GRC has a multicultural society that is considered when engaging with external

Asset Management Conference 2020 AMBoK ID: 4017 Page 2 stakeholders.

4. SKILLS AND UNDERSTANDING

When embarking on this type of engagement, the below traits have been identified to support delivery such as:

- **Patience –** The ability to navigate internal processes can be difficult, especially if this is the first time that this has been carried out. It is also likely that there may be several (possibly conflicting) views of how this activity is carried out. Receiving these views is important whilst maintaining confidence in the activity's direction.
- **Good communication skills –** In any business activity having these skills is a pre-requisite for success.
- **Topic preparation –** Understanding Asset Management and what the aim of the engagement is supports informed conversations to identify the underlying views and keeping discussions on track.
- **Understand the stakeholder's industry –** Having individuals who understand the stakeholder's industry and can relate to their needs and expectations provides a higher quality of response in that a more detailed understanding can be gained. This can be facilitated through having an awareness of who the internal subject matter experts are or undertaking an information gathering exercise ahead of time.
- **Preparation for the unexpected and out of scope questions –** Prior to facilitating an engagement activity, it is suggested to gain an appreciation to other concerns or frustrations that the stakeholder may raise. It is also important that the facilitator is aware that they are the face of the business and to avoid making any hasty commitments that cannot be fulfilled.

5. ACTIONS FOLLOWING ENGAGEMENT

The intention is to better understand the service the stakeholder experiences and how this compares with their expectations. In the immediacy, GRC will use this information to inform the scenario modelling on asset replacement and renewal programmes decision making to align service expectations. As the business matures, the stakeholder engagement will continue to be refined on key areas to inform business operations now and into the future.

6. VALUE GAINED

This exercise has provided GRC value through collating key internal and external contacts and organisational stakeholders to a central location to provide an opportunity for streamlined communications. By mapping the varied levels of interest across each asset portfolio, the business has a simplified view of those who have an impact on or who are impacted by decisions within each respective service. This shareholder shared knowledge within the organisation has increased on expectations and drivers associated with the services provided by GRC.

7. LESSONS LEARNT

As an organisation, GRC has gained considerable insight about its stakeholders. Some of the key lessons learnt from this exercise and used in other similar undertakings are:

- Having a dedicated team to undertake the endeavour to streamline the approach and maintain direction.
- Taking a staged approach is beneficial as this provides the opportunity to review progress. It provides the ability to amend engagement activities and create clear roles and responsibilities.
- It is important to have clear goals at each stage of the project. This assists to maintain intent and achieve the desired outcomes.
- As this activity requires collaboration with different internal departments, being able to collaborate with others early in the project is key to a successful outcome.
- Make time to plan the approach taking into consideration the internal and external factors that have an impact on the activity's overall success. Although timely responses are desired, there are situations in which carrying out the engagement at a later date will provide better value to both the organisation and its stakeholders.
- These activities can enhance reputation with the wider community by involving them and listening to their feedback. To foster a relationship, it is suggested to follow these activities with visible responses or actions where possible. This encourages regular messaging with the community utilising full circle communications.
- One should never assume what a stakeholder, wants or needs. An organisation needs to do the research and ask the questions to understand what the stakeholders, want, need and can afford.

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STAR PROFILE – Kevin Smith CPAM

1. **Why Asset Management?**

   My core interest in property developed into a passion to manage the complete lifecycle of assets from cradle to grave – and then witness the creation of a new & improved asset..

2. **How long have you been working in the Asset Management sector?**

   I have been working in asset management for 20 years – actively managing the assets of my employers, my customers and my family.

3. **What is your speciality?**

   I specialise in assets from the Built Environment (property) – for the Emergency Services Sector.

4. **What drew you to explore more about this particular speciality?**

   Natural attraction – always been fascinated with the Built Environment – and then as a SES volunteer I was actively responding to incidents where assets (houses, community infrastructure, commercial properties and motor vehicles) were impacted by natural events or human behaviour. I moulded my community spirit and passion for asset management into a career choice – and went to work for the Emergency Services sector.

5. **What's the best career advice you've ever received and who gave it to you?**

   "Proper Planning Prevents Poor Performance". My Dad repeated this advice to me constantly and eventually it sank in. Another piece of great advice was "never stop learning" provided by John Kouris.

6. **What makes a great asset manager?**

   The ability to listen and learn. Asset management is still coming of age – and there is a lot to be learnt from the Maintenance Engineers of the past, the Facility Managers of the present, and the Educators for tomorrow. The knowledge is out there and is held by multiple people and stored in multiple forms.

7. **What is the most exciting trend that you've noticed in Asset Management today?**

   The conversation and information sharing on Asset Management. The short seminars presented by the Asset Management Council is just a small example of the wonderful conversations being undertaken currently. Google is alive with information on asset management and how to drive improvement in preference to "this is the way we do things round here".

8. **What is the biggest challenge facing up-and-coming asset managers today?**

   The biggest challenge is the integration of Asset Management and Environmental Sustainability. The knowledge of how much embodied energy is contained within each asset and how much carbon is emitted during its operating lifespan; and potential for recycling or re-use – will add to the decision making complexity of future asset managers.

STAR PROFILE – Kevin Smith CPAM

9. What advice would you give to an up-and-coming asset manager today?

Enjoy the journey. There is plenty of diversity and interesting assets to manage. I have had the pleasure of managing hospitality assets, Scout halls, Air Ambulance bases, data centres, and Fire Fighter training centres powered by specialist gas fired appliances. You have the opportunity to find what makes asset management most interesting for you. Asset Management is everywhere, in every industry, in every country of the world.

11. What is your proudest career achievement?

I would say my proudest career achievement is inspiring others to consider asset management as a viable career option. I find my greatest satisfaction is contained within the enjoyment of others experiencing the same wonder, stimulations and challenges of managing assets that I feel.

12. What's next for you?

I have worked in the public and private sectors, Complete my Masters in Construction Management and find the right opportunity to influence the integration of asset management and environmental sustainability – to ensure the assets we manage not only serve the purpose of their design, but also serve the community and the environment into the future.

13. When you're not busy at work, what do you enjoying doing to unwind/relax/explore?

When at home I love to garden (growing own fruit and vegetables); reading to learn; and I go caravanning with the family to relax and explore this great country of ours.

Kevin recently achieved his Certified Practitioner of Asset Management (CPAM). To find out more about our internationally recognised certification scheme, visit www.amcouncil.com.au/certification

STAR PROFILE – Miebaka Kenneth Noryaa CAAM

1. Why Asset Management?

For me, it is not much of a choice but a progression. I am a maintenance professional and work for my country's National Oil Company. As I grew in rank, my roles changed too. I was required to establish and oversea daily and long-term strategies for managing production and operations assets within the organization. I am also involved in ascertaining and advising on service standards and policies, and monitoring asset performance, in terms of reliability throughout their life cycle. I have had present business cases to justify and convince business leaders on asset expenditures including design requirements and preferred alternatives to achieve business goals for the short and long term. I realize over time, that Asset management as a discipline is an upgrade to the maintenance profession and holds the body of knowledge that allows me to function in these roles effectively.

2. How long have you been working in the asset management sector?

Based on the knowledge I now have, I would say, 14 years.

3. What is your specialty?

As I mentioned earlier, I am a maintenance Professional. I have been a maintenance Planner and Scheduler. I am a Certified Maintenance and Reliability Professional (CMRP). I design or review, recommend, and oversea daily and long-term strategies for managing production and operations assets within the organization. I am also involved in ascertaining and advising on service standards and policies, and monitoring asset performance, in terms of reliability throughout their life cycle. I present business cases to justify and convince business leaders on asset expenditures including design requirements and preferred alternatives to achieve business goals for the short and long term.

4. What drew you to explore more about this specialty?

At first, it was in response to my perception of the trend of the Oil industry in my country. I sought to remain valuable with the changing industrial clime. I wanted to position myself to meet the future needs of my employer.

5. What makes a great asset manager?

I guess that a great asset manager should have a good sense of balance. A balance in soft skills and technical acumen including in business, finance, and Logistics. He should have great people skills and a keen sense of what constitutes "value" to stakeholders and interested parties.

6. What is the most exciting trend that you've noticed in asset management today?

The increasing popularity of the discipline at the policy and business decision levels.

7. What's next for you?

To attain CAMA accreditation.

8. When you're not busy at work, what do you enjoying doing to unwind/relax/explore?

I enjoy taking camping and fishing trips with my family. I also enjoy playing and watching football.

M. K. recently achieved his Certified Associate of Asset Management (CAAM). To find out more about our internationally recognised certification scheme, visit www.amcouncil.com.au/certification

Asset Maturity – Measure Performance and Build Value

An Interview with Michael Killeen

Linda Kemp, Communications Specialist,
Asset Management Council

When thinking about experts in asset maturity, one hardly needs to pause long for thought. At the Asset Management Council, board member Michael Killen is considered to be one of our best maturity gurus. It was a no-brainer, then, to seek his thoughts on asset maturity for this issue of The Asset Journal.

Michael currently works as Director, Greater Sydney Roads Assets, Transport for NSW. His remit covers all roads owned by NSW, including the most notable assets of Sydney Harbour Bridge and the Mascot Tunnel. However, his role also holds responsibility for 160,000 assets, including culverts and bridges, traffic lights, lifts, parking stations, bus lanes and bus stops, with a total value in excess of $26 billion.

Michael's asset management journey began more than twenty years ago at the start of his career, albeit in maintenance management. When he attended a training course in 1997 run by Peter Koehler, which focussed on the clear directives of asset management, Michael was instantly converted to its well-defined approaches and common-sense methods—the latter most frequently viewed in hindsight within the maintenance management role of the era. Michael's career trajectory in asset management has been on a steady uphill gradient ever since.

I ask Michael for his opinion on the most critical element of asset management. His response is swift: 'It's being able to think holistically across the organisation, being consistent in decision-making criteria and business processes.' He elaborates by stating it's less about delving into the details of physical assets, but more about the organisation holding firm to the principles of asset management across all business functions. The area of cost, risk, and performance, for example, is not so much about applying that element against a large engineering asset, but more broadly using its guidelines to inform areas such as risk and stakeholder engagement. Asset management ought to underpin the entire organisation.

Many readers will already be aware that the ISO 5500x is appropriately credited for its role in bringing asset management to a wider audience. However, I'm interested to hear Michael's thoughts on the ISO suite's impact on asset maturity and how the two sit hand-in-hand. Michael states that the international standards have provided a platform for asset management as a practice and have raised the profile of the asset management sector. The risk with ISO 5500x, in Michael's opinion, is that many organisations can view compliance as the end state, as opposed to one small, yet significant step on the journey to asset management maturity. To reiterate, ISO 5500x is compliance to a set of guidelines for an organisation to deliver value through its asset management system. It's not asset maturity in itself.

I'm keen to hear more about Michael's experience with implementing maturity assessments during his career, and I'm sure our readers are too. Michael obliges when I ask for the gritty details of implementing such, and the challenges and benefits along the way. The first example he offers harks back to Michael's tenure with an Australian airline, where the maturity assessment was instrumental in demonstrating the business's strong focus on a compliance culture, and gave permission to discuss the difference between compliance and achieving outcomes. This in turn became the incentive to transform the business, and for it to move up the maturity curve, while still keeping its important focus on compliance.

The second experience of Michael's in implementing maturity assessments became a catalyst for introducing changes to the organisational design, and provided new ways for management to seek improvements to the business. In this government role Michael states that the assessment journey paid particular focus on ways the business could improve its asset information environment, which at the time comprised over 60 different systems.

Such responses lead me to ask about ways that asset maturity affect the day-to-day running of the business. Michael responds by stating, 'Key criteria for asset management maturity is establishing context for why a business does certain activities on a daily basis.' He adds that it becomes all too easy for staff to get bogged down in tasks and lose focus of long-term goals, but asset management maturity will provide clear vision of the business processes that need altering in order to better measure performance and build value.

I know there must be readers curious to know more about the Asset Management Council's assessment tool, (details found at this url https://www.amcouncil.com.au/knowledge/asset-management-maturity.html), so my next question to Michael requires a deep insight of how it works, and its benefits over other, similar assessment tools across the market.

The AMCouncil's Asset Management Maturity Assessment Tool's clear benefit, in Michael's own words is the 'Robustness of the tool itself and its clear links to learnings derived from previous journeys in asset-intensive industries.' Michael continues by adding that the tool minimises any opportunity for bias in its avoidance of Likert scales. When undertaking the tool, answers are required in narrative form, ensuring that clear and present thought is given, rather than a mere 'tick and flick' response.

In discussing benefits, Michael adds a significant amount of expertise went into the development of the tool. In fact, the asset management heads that came together to create the tool collectively represent over 300 years of experience. Such proficiency and knowledge in its development ensures the tool is underpinned by links to the ISO 5500x, specifically Chapters 4-10, the Asset Management Systems Model, and includes benchmarking criteria against comparable organisations with similar industries.

The tool works by choosing one of three options, ranging from a light, self-guided assessment to a full assessment assisted by an asset management professional from the Asset Management Council. Each option provides a valuable roadmap for the business to make improvements to its asset management maturity journey. Additionally, the tool allows for the person to spend time constructing responses, check against written reports and data, save the information to come back at another, convenient time.

Given Michael's extensive experience in the asset management sector, he must have tips and advice for our readers. I ask him to provide three statements that may help others considering beginning an asset management maturity assessment:

1. Go into the assessment with an open mind.
2. Take all people in the business on the journey.
3. Look at the assessment in terms of how it can drive a new program of improvements and a new focus.

And to close our time together, I ask Michael to give readers one interesting fact about himself that doesn't relate to his daily work schedule. And prepare yourself because it's very interesting and very cool…

Michael discloses he is a keen motorbike rider and the owner of a spanking BMW. As we continue to chat, I detect a twinge of remorse in his tone when he reveals he doesn't get the opportunity to ride as much as he'd like, after sustaining an injury to his shoulder earlier this year. But I notice the lightness returns to his voice as he speaks about riding, the need to be wholly in the zone, to concentrate on the road and surroundings, and to keep a clear mind.

And it occurs to me as he talks that those are the qualities linked inextricably with a journey to asset management maturity.

Linda would like to thank Michael for his time and willingness to be interviewed for this article.

Knowledge and Empowerment

An Interview with Claire Maloney, Monash Health

Linda Kemp, Communications Specialist, Asset Management Council

In the week following the Asset Management Council's renowned annual conference, AMPEAK21, I had the pleasure of sitting with Claire Maloney, from Monash Health, to discuss her role and thoughts on asset management maturity.

Claire has been working as the Asset and Contracts Manager for Engineering Services at Monash Health for one year, finding a niche for herself with the organisation. Prior to this role, she began her asset management pathway in reliability engineering with a mining company, then moved to the marine industry where she started in modelling of ships and then stepped into a role in docking and mooring. For Claire, her role at Monash Health gives her scope to focus on an asset's lifecycle management and provides opportunity for her to extend her experience and career path with an employer whose values are closely aligned with her own.

When asked her opinion about the most critical element of asset management, Claire quickly responds with the twofold measure of knowledge and empowerment. Each so closely related, yet equally integral as a singular element. When asset knowledge and empowerment is shared across the business, when asset information is provided to asset operators, maintenance staff, and the executive team, decision-making is more transparent. Knowledge and empowerment improves line-of-sight, ensures that goals are aligned with business objectives and creates trust across the whole organisation.

This dovetails perfectly into my next question, so I ask Claire to give an example of how asset management improves business objectives. Asset management is, in Claire's opinion, the bridge that covers those empty voids that can often exist between departments. Knowledge gaps occur in every enterprise, and it is asset management that protects the business's information. Without a rigorous asset management strategy, asset information can become lost in the space between the workstations of the asset operators and offices of the executive team.

Claire's answer gives me pause to consider possible solutions to common problems in asset management. I ask Claire for her opinion on the most innovative solution implemented to prevent the loss of critical asset knowledge and data. Initially, she states that her answer does not refer to a specific tool, but her experience at Monash Health has proved that innovation starts with taking stock. In dealing with significant amounts of mature asset data largely contained in segregated portals, Monash Health was able to take stock, to collate that data to be housed in a central data warehouse. This broke down knowledge silos, and allowed the business to focus on not only their assets, but where policies and procedures align with objectives and asset management goals. It has allowed the organisation to truly make a difference in their asset management journey, and usher in more value for the business and their customers.

There are challenges within the asset management sector, and I probe Claire to share what she believes to be the primary day-to-day challenge. She hardly needs a breath before revealing that, in her mind, the challenge lies in showing the value in asset management. What precisely does this mean, I ask, and Claire mentions that in any business, each staff member is, or at least ought to be, involved in asset management; the task should not be left as the responsibility of one or two asset managers, but every employee. Asset management is often viewed as an abstract concept, but the challenge as Claire notes, lies in growing the understanding across the business that all people have a role to play in providing value for the business.

Given her experience in the sector, I ask Claire to pass on her top three advice statements. She responds with:

- **Go back to basics.** Many people reading this article will be at different stages in their business's asset management journey. Some will be beginning to structure their asset management framework, others will be leveraging digitisation of asset information, and yet others will be on the path to asset maturity. Claire suggests that no matter where the business is in its asset management space, to step back and take a look at the core values, the risk mitigation strategies and align to match the assets. All asset management processes are based on core rules, therefore if those rules change so ought the asset management journey change.
- **Be curious**. Get out of the 'This is the way we've always done it' mindset. It's not the optimum way to do asset management. New innovations, new technology, and big data are within reach and able to build value. If your business is hesitant to step into some of these new options, then take some time to be curious and learn from others. And even if only a small portion of what you've learned aligns with your business, you're still moving forwards.
- **Let people know where and how they fit into the asset management space**. Bringing your people on board creates trust, attachment, loyalty, and empowerment.

To close our interview, I ask Claire to tell me something interesting about herself, something that's not related to her work role. Without hesitation, she reveals herself as a board game aficionado and at one time, was even involved with a YouTube channel where she reviewed and played board games. Although this is no longer a functioning channel, she remains, in her own words, 'low-key obsessed with board games'. I can see in the camera's frame numerous board games in the bookshelf behind where Claire sits, and she tells me she owns about fifty. The room she is in for our interview is actually her games room, her happy place. And after a day in the office, facing all things asset management, the challenges and data, information and objectives, alignment and maturity paths, we all need one of those.

Linda wishes to thank Claire Maloney for her time and willingness to be interviewed for this article.

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CHAPTER **NEWS**

WHAT'S HAPPENING IN THE BRISBANE CHAPTER?

Tuesday 30th March saw Brisbane Chapter host the second technical seminar of 2021, This event was intended to be a hybrid format but the COVID restrictions announced the day before meant a revision to the arrangements to an online event. Around 100 people saw Wing Commander Keirin Joyce of the RAAF and Dr Stefan Hrabar CEO of Emesent present two different approaches to drones and their deployment in asset management activities.

These entertaining and informative presentations generated excellent questions and discussions. The drones in the presentations ranged from fully loaded military Drones to 30 gramme micro version and all sizes in between. This is an area where technology is moving fast and the outputs and capabilities are ever increasing. Who knows where we will be with this type of capability in 5 years - come back to us in 2026 and we will tell you. The following technical session was on Tuesday 4th, a hybrid session for those wanting to dial in online, while the in-person event will be held at the Engineers Australia offices.

It was a presentation on utilising assessments and audits to better understand facility asset portfolios. Leanne Cluley, Founder and Chief Executive Officer of Reduxo and Co-Chairman of the Diversity Portfolio Group at the Facility Management Association of Australia, presented real-life case studies of portfolio-wide programs to assess and audit facility assets, thereby enabling facility owners to better understand their assets and make optimised, evidence-based investment decisions.

WHAT'S HAPPENING IN THE PERTH CHAPTER?

The Asset Management Council Perth Chapter facilitated a government focused community of practice on 25 May, with virtually all agencies with large infrastructure asset portfolios represented, as well as the AMCouncil national chair, Dave Daines, and Perth Chapter chair, Dr Carla Boehl.

This is the 4th government CoP the Chapter has run in recent years. Phil Helberg (Chief Executive Officer, Infrastructure WA) presented on the State Infrastructure Strategy, and outlined the importance of effective asset management in managing existing assets, in addition to considering new infrastructure. Nigel Gravett (Asset Management and Infrastructure Operations Manager, Public Transport Authority) and Brett Belstead (Director Network Management, Main Roads WA) kicked off a panel discussion by outlining their agencies' progress in developing asset management plans and some of the lessons learned. The presentations were very well received and provoked some good discussion.

Thank you to our Perth Chapter and in particular, James Wright on the committee, who was instrumental in putting this event together.

WHAT'S HAPPENING IN THE SYDNEY CHAPTER?

The Asset Management Council Sydney Chapter facilitated a presentation on 13 May on how coaching with neuro-linguistic programming can create better leaders.

Throughout the virtual session, the audience imagined what it would be like to have extremely high self-awareness and personal alignment coupled with an in-depth understanding of others, and with this how different their conversations would sound and the impact would it have on their career and leadership journey. It was a fascinating session with an interactive 'anchor' exercise to finish.

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Powerlink Queensland
Powerplan
Professional Construction Strategies Group Ltd
QENOS
Quarterbac
Queensland Rail
Reeves Group Services Pty Ltd
Refining NZ
Rockfield Technologies Australia Pty Ltd
SA Water Corporation
School Infrastructure NSW
SEQWATER
Shoalhaven Water
SMEC Australia Pty Ltd
SPM Assets
SPM Assets Ltd
STRUCTURED CHANGE PTY LIMITED
Strukton Rail Australia Pty Ltd
Taronga Conservation Society Australia
Tasports
TasWater
TATWEER MIDDLE EAST AND AFRICA L.L.C.
Terotek (NZ) Limited
The Asset Management College
Transdev Sydney Pty Ltd
Trendspek
Unison Networks Limited
United Energy Services Pty Ltd
VicRoads
Victoria State Emergency Service
Water Corporation
WaterNSW
Worley Power Service
Yarra Ranges Council

ASSET MANAGEMENT COUNCIL

THE ASSET JOURNAL

Asset Management Council

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www.amcouncil.com.au

ASSET MANAGEMENT

AMPEAK

PROMOTE EDUCATE ASSIST KNOWLEDGE

2021

ASSET MANAGEMENT COUNCIL

ASSET MANAGEMENT – LEADING FOR SUCCESS

Crown Promenade, Melbourne

www.ampeak.com.au

AMPEAK 2021 Supplement

AMPEAK21 WRAP UP

The AMPEAK conference, held in Melbourne in April, was a great success! It was the first time AMPEAK has been done as a hybrid event, where delegates had the option of coming together either on site or virtually to share knowledge and best practice, create new contacts and network.

Over three days, both onsite and virtual delegates got to experience and enjoy:

- **over 100 different sessions**
- **5 varied and interesting key note speakers**
- **interactive workshop sessions**
- **international speakers from New Zealand, USA, UK, Brazil, Canada and South Africa**
- **professional development opportunities**
- **poster presentations from universities around Australia**
- **fun and energising social events**
- **many opportunities to network with each other and with sponsors and exhibitors**

Conference Themes

Drawing on the collective wisdom of over 100 speakers, the 2021 conference considered common asset management themes that included:

- Leading for Success
- People and Culture
- Tools, Systems and Models
- Technology
- Assurance, Compliance & Risk

KEY NOTE SPEAKERS

A line up of impressive keynote speakers kept the audience engaged and provided great insights. Keynote speakers included:

Mr Derek Osborn, Group Executive, Defence and Social Infrastructure, Ventia

Mr Dan Gregory, discussed leading for success.

Rear Admiral Katherine Richards, AM, CSC, RAN educated us on Seaworthiness: Navy's Foundation for Asset Management.

Mr Bernard Salt, entertained us with a piece on maintaining Australia's assets in a post-COVID world.

Mr John Hardwick, Asset Management at Transport for NSW, spoke on using asset management maturity to lead asset management reform

THANKS TO SPONSORS

AMPEAK was also incredibly successful because of the sponsors in particular:

Plenary

wsp

Networking Drinks

copperleaf

Coffee Cart

Jacobs

Lunch

GHD Advisory

Charging Station

Reeves
Asset Management Simplified

Supported by

ENGINEERS AUSTRALIA

All exhibitors at AMPEAK added an important element to the conference, allowing delegates to network, make new contacts and learn about key companies servicing the asset management field.

Everything about AMPEAK was a reflection of the vision and passion of the AM Council and the commitment to work with and support professionals from across all industries involved in asset management.

The AM Council was delighted with AMPEAK21 and we look forward to seeing you all at next year's conference.

SOCIAL FUNCTIONS

AMPEAK included several social events where delegates got to relax and network.

It began with a Welcome Function on the Sunday night at Pure South Kitchen along Southbank, overlooking the water. This offered delicious modern Australian food with a focus on Tasmanian and King Island produce.

This was followed by networking drinks on the Monday night and the Gala Dinner Awards Night on the Tuesday evening. The Gala Dinner was held at the breathtaking new venue, Crown Aviary. The evening included great food, amazing wine, and an entertaining stand up show from comedian Anthony "Lehmo" Lehmann.

And the winners are...

This year, excellence awards were given in six categories, recognising excellence in the management of assets and the use of best practice. Congratulations to all our winners.

- Innovation - Rio Tinto: Asset Management Simplification Program
- Information Management - Melton City Council: Asset Data Workflow: Project Completion to Visualisation
- Cost/Risk/Performance - Essential Energy: Assets Strategy Project
- Environmental and Social - Melbourne Water and AECOM: Managing the social value (amenity) provided by waterways
- Safety - TransGrid: Distributed Accoustic Sensing
- Diversity - AECOM: Success enabled by Diversity: Our Asset Management Team
- Best Paper: - Martin Boettcher, Ventia: High Speed Rule Based Criticality Analysis

AM Council presents awards at AMPEAK Gala Dinner

BEST PAPER

Martin Boettcher, Ventia, on high speed rule based criticality analysis

INNOVATION

Rio Tinto for their asset management simplification program

COST/RISK/ PERFORMANCE

Essential Energy for their assets strategy project

INFORMATION MANAGEMENT

Melton City Council for Asset Data Workflow: Project Completion to Visualisation

AM Council presents awards at AMPEAK Gala Dinner

SAFETY

TransGrid for distributed accoustic sensing

ENVIRONMENTAL AND SOCIAL

Melbourne Water and AECOM for managing the social value (amenity) provided by waterways

DIVERSITY

AECOM for success enabled by diversity: their asset management team

New Board member elected at the AM Council AGM

Wendy has over 25 years' experience across multiple sectors in both Australia and the United Kingdom; commencing her career in mining, resource, sugar, petrochemical and transitioning to the utility and energy sectors. She is a highly motivated and experienced Asset Management professional with strong leadership, management, change and communications skills gained in a range of roles with Origin Energy, Stanwell Corporation, Scottish Water and consulting organisations.

Wendy has led teams through major business events, including Asset Management initiatives in National, critical infrastructure organisations which achieved significant uplifts in Asset Management capability and maturity.

Wendy has a Bachelor of Engineering Degree (Electrical and Computer Engineering), an Associate Diploma in Electrical Engineering (Distinction) and a Graduate Certificate in Asset Management. Her Engineers Australia credentials include Engineers Australia Fellow, Engineering Executive (EngExec), Chartered Professional Engineer registered in the areas of Asset Management, Leadership and Management and Registered Engineer of Queensland BPEQ.

In addition to congratulating Wendy, the AM Council would like to thank outgoing Board member Dr Monique Beedles for her work and commitment to the role.

AMPEAK

DAILY DOWNLOAD

ASSET MANAGEMENT COUNCIL

DAY ONE | MONDAY 19 APRIL 2021

Last night's Welcome Reception was a fantastic start to AMPEAK. Held at Pure South Kitchen, it was vibrant, full of conversation, fine food and picture perfect views over the Yarra.

AMPEAK

DAILY DOWNLOAD

ASSET MANAGEMENT COUNCIL

DAY TWO | TUESDAY 20 APRIL 2021

CONFERENCE KICKSTART

Day One did not disappoint! In the opening plenary, conference convenor, Nicole Opie, introduced first keynote Derek Osborn, Group Executive, Defence and Social Infrastructure for Ventia who shared his personal journey in asset management, which started from humble beginnings in the Pilbara to his current role managing large contracts across a diverse range of industries.

Second keynote to take to the stage was Dan Gregory with an entertaining talk on industry trends (business model-fictation, cultural polarisation, overloaded with information, technological transformation, expectation inflation) and some tips on 'cultures of the willing.

NEWS UPDATE

AMCouncil held its AGM on Day One from 1pm to 1.30pm. Congratulations to Wendy McPate who was elected to the Board.

Many thanks go out to Dr Monique Beedles, outgoing board member, for her work and commitment to the role

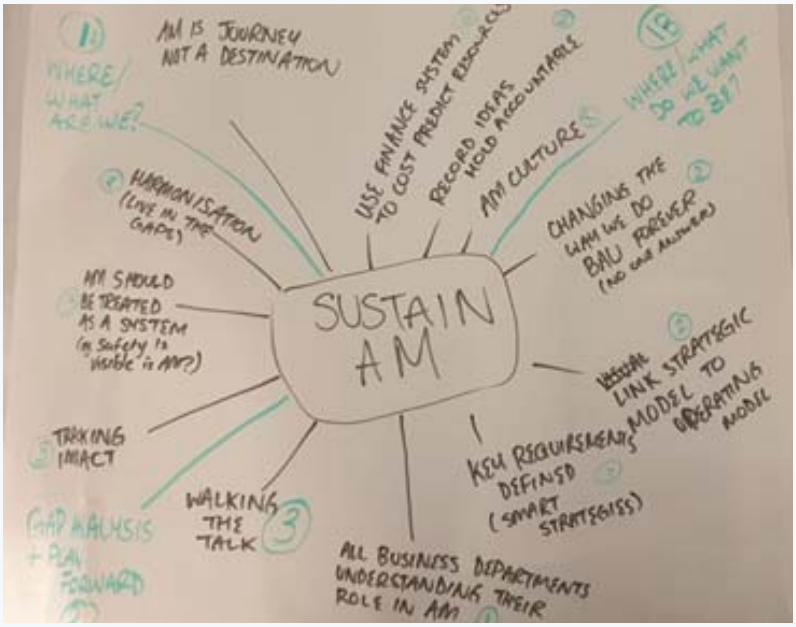
POSTS OF THE DAY

@PaulSakrzewski: Great to be back live at #AMPeak after a year of virtual events!

@ShaneDay: Great to be a part of the 2021 #AMPEAK #assetmanagement conference at Crown Promenade Melbourne. Fantastic turnout with a great lineup of presenters over the next 3 days.

@JoshuaThomas: My takeaway from today - the diversity of people attending from a broad range of industries and backgrounds!! It is so good to see AMPEAK grow year on year.

@DevanMaruthapillay: My takeaway, embrace AM challenges by engaging senior leaders on AM journey and capability. Engagement and story telling remains key to sustainable AM success



SOLVING PROBLEMS

Our problem solving forum was a hit. Dr Monique Beedles led the group as they endeavoured to tackle common asset management challenges

WIN - AMF TRAINING

What is your top tip for asset management?

Visit the Asset Management Council's booth to record your 30-sec video telling us your top tip for asset management and go into the draw to win one of two **Asset Management Fundamentals** training course registrations.

Courses are virtual and run monthly over two consecutive half-day mornings.

SOCIAL SPLASH

AMPEAK

DAILY DOWNLOAD

ASSET MANAGEMENT COUNCIL

DAY THREE |WEDNESDAY 21 APRIL 2021

2021 ASSET MANAGEMENT EXCELLENCE AWARDS

The Crown Aviary set the scene for our much anticipated AMCouncil Excellence Awards last night.

Congratulations to winners:

Innovation:
Rio Tinto, Asset Management Simplification Program

Information Management:
Melton City Council, Asset Data Workflow: Project Completion to Visualisation

Cost/Risk/Performance:
Essential Energy, Assets Strategy Project

Environmental and Social:
Melbourne Water / AECOM, Managing the Social Value (amenity) provided by waterways

Safety:
TransGrid, Distributed Acoustic Sensing

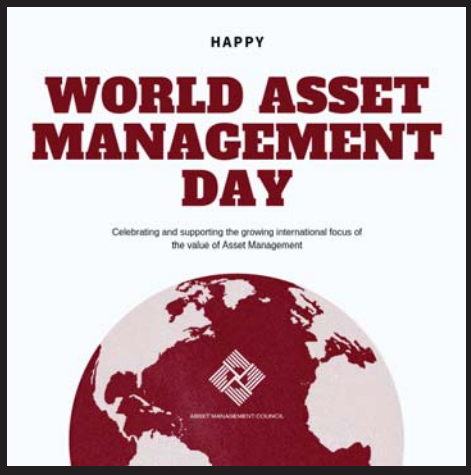
Diversity:
AECOM, Success enabled by Diversity

Best Paper:
Martin Boettcher, Ventia: High Speed Rule Based Criticality Analysis - When near enough is good enough

POSTS OF THE DAY

@VijayEden: Celebrating happy international asset management day with some awesome colleagues @THorstead: All set for pre-dinner drinks on World Asset Management Day!

@LiamBarry: Very much enjoying the opportunity to attend and present at the 2021 Asset Management Council AMPEAK Conference in Melbourne. Hearing insightful speakers about #assetmanagement #leadership and #innovation, particularly today on World Asset Management Day.



CONGRATULATIONS TO OUR AMPEAK WINNER

A big congratulations to the winner of virtual registration in this year's AMPEAK competition, Jill Meehan, one of our Brisbane Chapter members. We asked how you led for success during 2020? This is what Jill answered: *I have led for success through 2020 in two key areas: 1. Took charge in developing a strategy for Asset Management improvements and rolled this strategy out across site. 2. Led my team through COVID and the challenges with working from home, including the mental health implications of this.*

Special mention also goes out to Mary Irwin-Davies, one of our Adelaide Chapter members, who put forth the following notable entry:

Assessed - everything from schedules, to keep things on track
Systematically - reviewed the data and translated it into useable facts
Strategically - created documents and work plans for a consistent approach
Educated - My Community, my Council, and my teams on Asset Management
Took Time - to recharge and focus on family and friends

SOCIAL SPLASH









PICTURES FROM AMPEAK 2021

APRIL 2021 MELBOURNE, VIC