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ASSET MANAGEMENT COUNCIL

Experiences in implementing asset management frameworks

Asset management capability uplift in TAFE NSW

Implementing a risk-based approach to the management of critical public assets across Victoria

Coupling best practice with emerging technologies to meet asset management challenges for sustainability and resilience

Achieving better outcomes through integrated performance, risk and decision-making frameworks

A framework for implementing Total Productive Maintenance aligned with ISO 55001 standard for asset management

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ERNST KRAUSS

EDITOR IN CHIEF

Since the global awareness of Asset Management of physical assets and the implementation of the required frameworks, many organisations have been successful in creating sustainable improvements in their operation. There are many others that adopted an Asset Management framework but require support in revitalising the original framework. What makes the difference between long term success and short term gains? I believe that like all serious changes in organisations, a comprehensive Change Management Plan, strong leadership sponsorship and focused communication and implementation are imperative.

All successful transformations should start with the fundamental question: "Why". Why is such a change needed and what are the outcomes to be realised? In many relevant cases I observed in Industry intending to implement an asset management system, this clarity of purpose, direction and Leadership was missing. The outcome is predictable…frustration sets in at all levels. In successful implementations of an Asset Management framework, it is evident that the clarity "Why" the change is needed enables successful organisations to align their operations effectively and achieve lasting benefits.

As one example, I recently saw a well-developed Asset Management Framework on a Company's intranet, with guidelines and templates and some process maps. I thought that this must be clearly a success story in all branches of the organisation. When I asked at the branches how they implemented the system locally, the question was dismissed, stating that one cannot add this burden of changing to an already resource stretched operation. A sad case of value erosion, lost opportunities and loss of return on the investment.

Fortunately, there are numerous examples of success stories. Successful Asset Management System implementations are characterised by active engagement of the Leadership teams, a single point responsibility not only for developing the framework and system but also to guide the necessary communications and implementation. In a recent such project I had the privilege to assist with, there was clear ownership in the Leadership team, they appointed a knowledgeable "Chief Asset Management" position as accountable for the system generation and implementation and tracking progress at top level in the organisation. It seems to me that more Leaders at the Chief Officer level would benefit from better understanding of the value and advantages of Asset Management.

The increased participation we see in activities of Asset Management Societies globally and in Australia in the Asset Management Council is encouraging. These developments suggest that understanding and adoption of asset management practices will continue to mature across public assets and industries. Reinforcement of Asset Management is of course available at AMPEAK in 2026 in Perth and by participation in the many programmes and resources that are provided by the volunteers in the Asset Management Council and its Chapters. We hope to see you at one of these events, but specifically at AMPEAK 2026!



FROM MY DESK: NATIONAL CHAIR'S LETTER

NATIONAL CHAIR, TOBY HORSTEAD

Our last edition looked at the value of using asset management models. This edition explores experiences in implementing asset management frameworks. For me asset management models and implementing frameworks are intertwined. Success in implementing asset management comes when models and frameworks are pragmatic and representative of the organisation operating model.

My experience is success comes when asset management is governed by representatives from across the business and there is a small core team that has responsibility for curation and application of asset management practices and processes. Another key to implementing an asset management framework is to be working under a principle based and communicated asset management Policy. I look forward to the insights in this edition of the Asset Journal.

In October we held an insightful Government Symposium that explored the transformative nature of asset management. Thank you to the AM Council team and volunteers who brought the program together that featured Infrastructure South Australia and government representatives from NSW and Victoria. A highlight for me was hearing how an improving asset management approach was supporting Taronga Zoo's animal conservation.

As foreshadowed at AMPeak last April my time as the National Chair will conclude at the end of 2025. I am pleased that Wendy McPate will step into the role in the new year.

In reflecting on my nearly four years as National Chair I am immensely pleased with the positive impact the AM Council has made, with highlights including:

- Growth in the attendance and impact of the AMPeak conference,
- The success and growth in our one-day Symposiums, we now have two in Australia and one in New Zealand each year,
- Continuing to provide face to face technical networking o pportunities, that has now grown to include remote hubs,
- Reinvigoration of our Young Asset Management Professionals group with some outstanding technical events and engagement,
- Our support for emerging international asset management organisations,
- Our members contributions to global initiatives such as the GFMAM Landscape 3.
- Continuing our Australian certification scheme that, with WPiAM endorsement, providing international recognition,
- Pushing beyond the traditional application of asset management practices to non-infrastructure assets such as art collections and information,
- Increased accessibility to our members asset management body of knowledge,
- Development of the Career Planning tool,
- Delivery of asset management climate and environmental related guidance by our Sustainability and Resilience in Asset Management special interest group.
- The continuing demand for the AM Council perspective in New Zealand in a time of change for the asset management landscape,
- The increased focus and growing asset management narrative and requirements across Australian State Governments, and
- Growth in our corporate and individual membership that has resulted in an increase of more than 30%

The AM Council is financially very well positioned to take the emerging Strategy'28 forward and provide greater impact for our members and advance the art and science of asset management.

Our strategy will take forward our focuses on knowledge, capability and recognition, community and connection and influencing for asset management. An updated constitution is intended to remove administrative ambiguity and set us up for the future, whilst retaining the focus on our purpose and value of our members and volunteers. This is a mature and positive step for the AM Council.

I am looking forward to seeing as many members as possible at AMPeak in Perth next April where will look at how asset management can power productivity and prosperity. It will also be a chance to recognise some amazing volunteers and the excellence in asset management of our members.

I recognise that asset management is a unique grouping of professionals, and we are not singularly focused on an industry or a part of society.

As I sign off I would like to thank the nine Directors that have been on the Board whilst I have been National Chair.

Finally to all our members, active volunteers and staff, you make this wonderful diverse community a great place to learn, grow and "have fun".

TECH 1



ARTICLE 1 – Asset Management Capability Uplife in TAFE NSW - a four-year journey sharing proven practices and lessons learnt

Farid Beshara & Daniel Rawsthorne, TAFE NSW

SUMMARY

In October 2019, the NSW Government released the Asset Management Policy TPP19-07 (Policy), which came into effect in November 2020. NSW Government entities were given a four-year transitional period to align with the Policy requirements. This paper provides an overview of TAFE NSW's journey during this period, highlighting the challenges and opportunities encountered. We will discuss the robust governance arrangements established to guide Policy implementation, the development of an Asset Management Framework, and enhancements to critical enablers such as culture, data, and processes. Additionally, we will outline the roadmap for continuous improvement, aimed at elevating TAFE NSW's asset management capabilities from compliance to high performance.

The success of TAFE NSW's implementation underscores the value of a strategic approach to asset management, demonstrating significant progress from an awareness level in 2021 to full alignment in 2024.

Keywords: Policy, asset management, maturity, capability, continuous improvement, governance, strategy, strategic and ISO55001/2

1 INTRODUCTION

The Asset Management Policy for the NSW Public Sector (TPP19-07), released in November 2019, aims to enhance asset management by strengthening accountability, performance, and capability across the NSW public sector. The policy requires agencies

to adopt core management practices for non-financial assets to meet service delivery objectives efficiently. The goal is to achieve a consistent and improved approach to asset planning and delivery, considering asset lifecycle costs, performance, risk, and economic modelling to support the NSW Government's strategic priorities. This presented a major shift of asset management capability and maturity for a number of agencies. Under the policy requirements, agencies were mandated to:

- Make better use of existing assets
- Adopt clear definitions and methodologies for reporting maintenance backlogs and addressing them
- Broaden asset performance assessments to consider economic, social, and environmental benefits
- Develop a 'system-of-systems' approach across interconnected infrastructure networks
- Adopt innovative technologies for asset operation and maintenance
- Use quality data for evidence-based decision making, balancing cost, risk, and performance

2 AIM

This paper has three aims or objectives:

- To outline the 4-year journey and the changes TAFE NSW has implemented to ensure compliance with the NSW Government Asset Management Policy requirements
- To outline the challenges and opportunities presented during the policy implementation period
- To identify the next steps for TAFE NSW to transition from "compliance" to "performance improvements"

3 TAFE NSW ASSET MANAGEMENT IMPLEMENTATION JOURNEY

Upon the release of the NSW Government Asset Management Policy TPP19-07 in October 2019, TAFE NSW adopted the Policy Transitional Arrangements, allowing four years from November 2020 to comply with the policies core requirements. During this period, TAFE NSW was required to develop an implementation plan with annual milestones and deliverables. TAFE NSW was also required to submit an annual Attestation Statement signed by the Managing Director to NSW Treasury. Independent assessments and reviews of asset management maturity were mandated, with Infrastructure NSW (INSW) reporting the results of such reviews to the NSW Cabinet. Additionally, the NSW Auditor-General could also audit compliance. The TAFE NSW Asset Management Implementation Plan (AMPI) outlined phases and deliverables for compliance with the policy requirements. Support from top management and the Executive Leadership Team (ELT) was crucial for successful implementation.

4 THE POWER OF "TOP MANAGEMENT" SUPPORT

The successful implementation of an Asset Management Policy and ISO 55001 standards relies heavily on senior leadership support and commitment to enable key areas, such as leadership, resource allocation, policy development, organizational culture, performance monitoring, risk management, and stakeholder engagement. Governance is also crucial for effective asset management policy implementation, ensuring clear accountability, strategic alignment, consistency, risk management, performance monitoring, resource allocation, stakeholder communication, compliance, continuous improvement, and strategic decision support.

In 2021 and in line with the AMPI Implementation Plan, governance arrangements were established, comprising an Asset Management Steering Committee (AM SteerCo) to engage "Director or above" level executive representatives from all divisions and groups within TAFE NSW. The AM SteerCo is supported by several Reference/Working Groups responsible for the various deliverables under the TPP19-07 core requirements. The AM SteerCo meets quarterly and is overseen by TAFE NSW Managing Director and the Executive Leadership Team (ELT).



5 ASSET MANAGEMENT CAPABILITY UPLIFT – A MUST HAVE

The importance of Asset Management Capability Uplift in Organisations Implementing Asset Management Policy and ISO 55001, cannot be understated or ignored. Having a Capability Development or Uplift Plan will enhance and assist with:

- **Enhanced Competence and Skills:** Asset management capability uplift ensures that individuals involved in managing assets have the necessary skills and competencies. ISO 55001 requires organisations to understand the competences required, periodically review and update them, and bridge any gaps. This leads to more effective and efficient asset management practices.
- **Improved Decision-Making:** With enhanced capabilities, organisations can make better-informed decisions regarding asset management. This includes decisions related to asset lifecycle costs, performance, risk, and economic modelling. Improved decision-making supports the strategic priorities of the organisation and ensures optimal asset performance.
- **Increased Efficiency and Effectiveness:** Capability uplift helps organisations streamline their asset management processes, leading to increased efficiency and effectiveness. By adopting best practices and innovative technologies, organisations can optimize their asset management activities, reduce operational costs, and improve service delivery.
- **Compliance with Standards:** Implementing ISO 55001 standards requires organisations to have a robust asset management system in place. Capability uplift ensures that organisations can meet the requirements of these standards, leading to formal certification or alignment with best practices. This provides assurance to stakeholders that assets are being managed effectively.
- **Risk Management:** Enhanced asset management capabilities enable organisations to identify, assess, and mitigate risks more effectively. This is crucial for maintaining asset performance and ensuring the resilience of critical infrastructure. Effective risk management also helps organisations avoid costly disruptions and maintain service continuity.
- **Continuous Improvement:** Capability uplift fosters a culture of continuous improvement. By regularly assessing and enhancing asset management practices, organisations can adapt to changing conditions, incorporate new technologies, and continuously improve their asset management performance.
- **Stakeholder Confidence:** Demonstrating a commitment to asset management capability uplift builds confidence among stakeholders, including employees, customers, suppliers, and regulatory bodies. It shows that the organisation is dedicated to managing its assets responsibly and sustainably.

In summary, asset management capability uplift is essential for organisations implementing an asset management policy and ISO 55001 standards. It enhances competence, improves decision-making, increases efficiency, ensures compliance, manages risks, fosters continuous improvement, and builds stakeholder confidence.

6 CHALLENGES, OPPORTUNITIES AND KEY INSIGHTS – LESSONS LEARNT

Implementing an asset management policy or strategy can present several challenges and opportunities for organisations. These are some of the challenges and opportunities experienced by TAFE NSW:

Challenges:

- **Resource Constraints:** Allocating sufficient financial, human, and technological resources to implement and maintain the asset management policy can be challenging, especially for organisations with limited budgets.
- **Change Management:** Shifting the organisational culture to embrace new asset management practices and processes may encounter resistance from employees. Effective engagement, communication and training are essential to overcome this resistance.
- **Asset Data Quality and Availability:** Ensuring the availability of accurate and comprehensive

data for asset management decision-making can be difficult. Organisations may need to invest in data collection, management, validation and analysis systems.

- **Complexity of Implementation:** Implementing an asset management policy involves multiple phases, stakeholders, and interconnected processes. Coordinating these efforts and ensuring alignment across the organisation can be complex.
- **Compliance and Regulatory Requirements:** Meeting compliance and regulatory requirements can be demanding, requiring organisations to stay updated with evolving standards and regulations.
- **Risk Management:** Identifying, assessing, and mitigating risks associated with asset management can be challenging. Organisations need to develop robust risk management frameworks.

Opportunities:

- **Improved Asset Performance:** Implementing an asset management policy can lead to better asset performance, reduced downtime, and extended asset lifespan, resulting in cost savings and enhanced service delivery.
- **Strategic Decision-Making:** Enhanced asset management capabilities enable organisations to make informed, data-driven decisions that align with their strategic goals and priorities.
- **Cost Optimisation:** Effective asset management practices can help organisations optimize costs by reducing maintenance expenses, improving resource utilisation, and avoiding costly asset failures.
- **Enhanced Compliance:** Adopting best practices and standards, such as ISO 55001, ensures compliance with regulatory requirements and provides assurance to stakeholders.
- **Risk Mitigation:** Robust asset management frameworks help organisations identify and mitigate risks, ensuring the resilience and reliability of critical infrastructure.
- **Innovation and Technology Adoption:** Implementing an asset management policy encourages organisations to adopt innovative technologies and practices, leading to improved efficiency and effectiveness.
- **Continuous Improvement:** A focus on asset management fosters a culture of continuous improvement, encouraging organisations to regularly assess and enhance their practices for ongoing benefits.
- **Stakeholder Confidence:** Demonstrating a commitment to asset management builds confidence among stakeholders, including employees, customers, suppliers, and regulatory bodies.

To ensure the success of the AMPI plan, a Resistance Prevention and Mitigation Plan (RPMP) was developed within the wider Change Management Plan (CMP).

The RPMP focused on the following key elements:

- **Communicate:** sharing of information at the right time, with the right people
- **Collaborate:** engage stakeholders in the "Discovery & Consultation" activities
- **Engage Champions:** Recruit "Change Champions" as pilot group and future delivery advocates
- **Adapt:** adopt an agile approach to project implementation and adjust our approach to meet emerging needs
- **Focus on Capability:** build skills, knowledge and competencies through targeted capability uplift programs
- **Celebrate Success:** maintain momentum and energy through recognition and celebration of success

Key insights:

The key insights and lessons learnt during the policy implementation phase highlighted the significance of having Senior Leadership support, quality asset data, continued engagement and collaboration, embedding a continuous improvement culture and the engagement in external and peer review benchmark exercises.

- **Senior Leaders:** Senior Leadership support and commitment – without it, little chance of success.
- **Asset Data:** Reliable and accurate asset data – No big bang but progressive and incremental improvements is key.
- **Engagement:** Engagement and collaboration at all levels of the organisation – explain the value and benefits of Asset Management.
- **Continuous Improvement:** Continuous improvement – not a slogan but a way of working.
- **External Reviews:** Independent reviews (peer or formal external assurance reviews) are critical to flag areas for improvement and best practices.

7 WHERE WE WERE?

Over the last twenty-five years, TAFE NSW operational model, structure and asset base evolved to the current model supported by the 2022-27 Strategic Plan, a Twenty-Year Infrastructure Strategy (2022-42) and a Charter of Service commitments (2025). With the move from a 10 individual institutes model to the ONE TAFE model which came into operation as part of the TAFE NSW 2016 modernisation program. The program aimed to transform TAFE NSW into a more flexible, efficient, and competitive organization by moving away from separate institutes to a single institute/entity model.

The ONE TAFE model provided opportunities to consolidate systems, people, processes and technology but also introduced a number of challenges in consolidating various asset registers, asset data, asset hierarchies and a variety of ways of working processes.

As a result, there was:

- Multiple spreadsheets of assets data, information and registers
- No uniform asset hierarchy structure
- A consolidated Fixed Asset Register (FAR) not fully aligned to the asset base/count
- No asset performance reporting or tracking
- General lack of engagement or knowledge of the asset base or structure
- Lack of asset management training and capability overall

8 WHERE WE ARE NOW - WHAT HAS CHANGED?

A number of noticeable and incremental changes in TAFE NSW around Process, People and Technology did occur over the last four years, resulting in an improved risk rating across the three areas. These improvements were key in TAFE NSW achieving an improved Infrastructure NSW (INSW) asset management maturity assessment score from a low of 2.4 in 2021 to 3.9 in 2024 and 2025 score yet to be announced. This has been managed through a challenging environment, including COVID-19 pandemic, severe flooding events, a new operating model and a charter of commitments for TAFE NSW following from the NSW vocational education and training (VET) review in 2024.

Process:

- A new asset management framework (AMF) developed to enable integrated asset planning, delivery, maintenance and asset repurposing/re-use activities and inform critical decision making and optimised asset performance
- New and refined ways of working to support asset management capability across the lifecycle
- Benefits realisation and assets performance tracking introduced
- Service outcomes and level of service in development

People:

- Forming of Asset Management Reference or Working Groups covering all TAFE NSW asset classes
- Increased level of awareness on asset management principles
- A shift in mindset on how we value assets to ensue efficient use of available funds
- Uplift in asset management knowledge and skills to support transition to future state ways of working

- Behavioural change to support integration of new and refined ways of working

Technology:

- Developed Power BI visualisation tools for asset data and insights
- Agreed single data source to support evidence-based decision making across all asset classes
- Robust and consistent data to enable reporting, analysis and continuous improvement activities
- A tailored Asset Management Solution Dynamics 365 system capability developed and rolled out

9 WAY FORWARD – KEEPING THE MOMENTUM

The continuous improvement model developed by TAFE NSW is an aspirational future-state model that TAFE NSW seeks to achieve within the next 3-5 years, in line with an overall improved asset management performance and maturity across all areas of operations and service delivery.

- **Asset Management Framework (AMF):** embedded and supported by an Asset Management Policy, Strategic Asset Management Plan (SAMP), Asset Management Plans (AMPs), Asset Register and Ways of Working processes.
- **Asset Planning and Needs:** well-articulated, evidence-based, risk and cost-based identification of service delivery needs matched with the right assets at the right time at the right location.
- **Asset Performance:** is regularly measured, tracked, monitored, understood and linked to the decision-making process.
- **Asset Management Capability:** becoming mainstream way of working and targeted to roles involved in the asset decision-making process to support business operations and service delivery.
- **Experienced and subject-matter expertise:** available and accessible to internal TAFE NSW stakeholders requiring sound advice throughout the asset lifecycle stages.
- **Communication and engagement:** through the participation in the Asset Management Community of Practice (AM COP) and other relevant COPs. Transfer of asset management knowledge to internal business units.
- **Continuous Improvement:** continual improvement through the ongoing collaboration on the latest development and process improvements.

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TECH 2



ARTICLE 2 – Implementing a risk-based approach to the management of critical public assets across Victoria

Richard Williams & Sam Monkiewicz,
Department of Energy, Environment and Climate Action, Victoria

SUMMARY

DEECA oversees the performance of a diverse range of physical assets worth over $2bn including roads, bridges, coastal assets, firefighting vehicles and plant, buildings and other fixed structures. Over the past 2 years we have matured our frameworks on asset risk and criticality across 3 key asset classes, underpinned by the DEECA corporate risk management approach.

Within the Coastal Protection Structures (CPS) asset class, we manage 1,100 coastal assets across Victoria (including seawalls, revetments, groynes and breakwaters) for both their community and amenity value and their role in protecting infrastructure and foreshores from wave attack, erosion and climate change sea level rise. Most of these CPS are ageing, with increasing community use and expectation. We now apply an improved criticality framework to prioritise and optimise investment based on a range of tailored criteria, including safety, environmental, exposure, etc. This informs better financial modelling, strengthens the case for funding, and focuses our efforts on key assets at risk of critical service failure.

In our airbase asset class, we have also begun implementing key reforms in how we use a risk lens to guide operational practices and investment. Moving from a reactive, locally managed approach to upkeep of these facilities, we are applying consistent approaches to maintenance, renewal, condition

monitoring, and spare inventory for sub-assets based on risk ratings. Across 65 airbases, we have 29 different sub-assets from airside infrastructure, to retardant mixing and loading equipment, to crew rooms. Tailoring the approach based on risk consistently across the state allows us to make the most effective use of scarce resources to ensure our most critical assets are ready and reliable whenever needed.

Uplift in our Regional Facilities asset class has also utilised a risk-based approach. We have begun with an initial focus on 90 priority sites across the state, and first aligned on a clear understanding of generic, statewide risks. We developed 13 risks, identified the requirement mitigations, and rated them pre and post treatment. We are now in the process of site-level assessment based on these 13 risks to give us a clear and tangible understanding of where we need facilities investment based on a universal perspective of our key risks.

We have also published an article on DEECA's Asset Management reform journey in the September edition of The Asset Journal (p.25), "Asset Management as a Strategic Capability to Deliver Business Value".

Keywords: Assets, government, DEECA, roads, bridges, coastal, protection, firefighting, vehicles, equipment, facilities, land, management, reform, criticality, risk

1 INTRODUCTION

The Department of Energy, Environment and Climate Action (DEECA) manages a vast and diverse portfolio of assets valued at approximately $2 billion (DEECA, 2023), with annual maintenance and operating costs exceeding $60 million. These assets include roads, bridges, coastal protection structures, firefighting vehicles, specialist equipment, and facilities across the state. They play a crucial role in delivering essential services such as emergency response and preparedness, land management, tourism, recreation, and coastal protection.

Managing these assets is becoming increasingly challenging due to rising costs, a worsening operating environment caused by climate change, and growing legislative and community expectations.

The cost of replacing and renewing assets is unlikely to return to pre-COVID-19 levels (ABS, 2024), and climate change is making conditions harsher, increasing the frequency and severity of disasters while extending the fire season (Climate Council, 2023). The devastating 2025 Los Angeles fires, which occurred during the northern winter, highlight the growing unpredictability of fire activity. This shift is straining preparedness efforts, reducing planned burning windows, and limiting global asset availability, such as firefighting aircraft shared between hemispheres.

To address these challenges, DEECA launched the **Asset Strategy Reform Project** to enhance and standardise asset management practices with 3 key objectives:

1. **Improving visibility and oversight** by strengthening risk, safety, compliance, and total cost-of-ownership information and decision-making frameworks.
2. **Optimising service delivery** to ensure critical resources are directed to areas of greatest need.
3. **Planning for the future** by building more robust evidence-based investment strategies and options analysis.

A risk and criticality focused approach has been particularly important to outline the rationale, trade-offs and implications of different investment decisions, operational practices, and maintenance plans.

Using this framework (see Appendix), DEECA is now applying targeted reforms to specific asset classes, prioritising areas with the highest value and need. The following sections will explore the strategies being implemented for Coastal Protection Structures, Airbases, and Facilities.

2 COASTAL PROTECTION STRUCTURES

DEECA manages more than 1,100 Coastal Protection Structures (CPS) across Victoria, valued at more than $500 million. These assets — including seawalls, revetments, groynes, and breakwaters — play a vital role in protecting infrastructure and foreshores from wave damage, erosion, and rising sea levels due to climate change. They also provide significant community and recreational benefits.

Many of these structures are reaching the end of their lifespan, as a large portion were built in the last century (Figure 1). At the same time, community expectations and climate-related risks continue to grow, increasing the demand for effective coastal protection measures.

Managing coastal protection structures (CPS) in Victoria is highly complex. Some assets were only recently added to an asset register, while many others remain unrecorded. Although DEECA oversees all coastal crown land, CPS management involves 57 separate land managers with varying levels of involvement. As a result, many assets lack historical records on their construction, maintenance, or even basic details like condition and dimensions. Despite this, DEECA must report annually on CPS under the Asset Management Accountability Framework (AMAF) as part of its obligations under the Financial Management Act 1994.

Each coastal location presents unique challenges, as coastal environments are constantly changing. Different CPS types serve different functions, requiring tailored maintenance and construction approaches. Additionally, all coastal developments must comply with the Marine and Coastal Act 2018, while the Marine and Coastal Policy 2020 requires an adaptation pathways approach. This means a simple like-for-like replacement of aging infrastructure is not always an option. Planning ahead is difficult, especially in a constrained funding environment where asset management practices are still evolving.

2.1 Advancements in Coastal Asset Management

Despite the historical lack of documentation for CPS in Victoria, DEECA has made significant progress in recent years, including:

- Visual Inspection Guidelines for CPS – This framework ensures a consistent approach to assessing the condition of all CPS asset types and materials in line with DEECA's corporate standards.
- Risk Assessment Guidelines for CPS – This provides a standardised method for assessing risks associated with CPS, aligning with DEECA's corporate standards and central risk management guidelines.
- Asset Class Management Plan – This long-term strategy balances cost, risk, and performance in CPS management.

2.2 Addressing Prioritisation Challenges

With a solid foundation of asset management documentation, DEECA has conducted statewide assessments to collect data and evaluate CPS across Victoria, providing a strong evidence base for project planning. However, due to the historically reactive "fix on fail" approach, many CPS were already in poor condition or had failed, posing significant risks. Limited funding made it difficult to determine priorities, requiring a strategic approach.

To address this, DEECA implemented a **Criticality Framework** for CPS in 2024. This framework defines criticality as "a relative measure of



Figure 1: Olivers Hill masonry seawall, built in 1949, following storms in Sept. 2024

the impact of the loss of asset function on the organisation's objectives, optimising decisions for long-term planning, maintenance, and reliability improvements."

Using this framework, DEECA now applies a multi-layered prioritisation process (condition -> risk -> criticality -> priorities). This structured approach ensures alignment with ISO 31000 and AMAF, providing greater confidence in risk management strategies while improving long-term planning and resource allocation.

2.3 Methodology

To establish criticality inputs, DEECA conducted multiple internal workshops encompassing operational and dedicated asset management teams. These sessions focused on identifying reliable data sources that could be applied at the individual asset level while aligning with DEECA's strategic outcomes (Table 1: Criticality criteria and alignment to DEECA strategic outcomes).

Through this process, a **set of criticality criteria** was developed, covering the entire asset base. Each sub-criterion was designed to be **scored on a 5-point scale.** Once scores were assigned, weightings were applied, and the total points were calculated to determine a final **criticality score** for each asset.

Table 1: Criticality criteria and alignment to DEECA strategic outcomes

As an example of how this applies in practice, two identical seawalls could be proposed for works due to each being in poor condition and high risk due to protecting >$100,000 worth of assets. However, if one seawall was also a high safety risk as well as a popular recreational area, it would come out with a higher criticality point score and would be prioritised above the other dependent on weightings and the available budget.

2.4 Optimised Delivery

The Criticality Framework development and support for implementation through the Asset Strategy Reform Project has resulted in a risk-based, optimised service delivery approach for CPS. With criticality data now available, DEECA can apply a rule-base decision tree to determine when an asset is selected for inclusion on the capital works program using multiple sources of evidence. This is also fully incorporated into financial modelling for various funding scenarios, strengthening business cases by highlighting the risks of inaction as well as the costs associated with meeting various performance targets, ensuring efforts are focused on key assets at the highest risk of critical service failure.

3 AIRBASES

DEECA operates 65 airbases throughout Victoria, primarily supporting aerial firefighting efforts. These airbases are strategically positioned to provide comprehensive coverage across crown land and rural areas susceptible to wildfire. Each airbase features up to 29 different types of assets, including crew facilities, briefing rooms, comms rooms, refuelling stations, and retardant mixing equipment. They are managed at the district level and often share

Table 1: Criticality criteria and alignment to DEECA strategic outcomes

Criticality Criteria	DEECA Strategic Outcomes	Criticality Sub-Criteria
Asset Function	Planning	Asset Function
		Exposure
Environmental	Climate Change, Environment and Resource Recovery, Land Management	Environmental Damage
		Erosion Vulnerability
		Cultural Heritage
Health & Safety	Emergency Management, Planning	Social / Recreational
		Wellbeing and Safety
Legal	Land Management	Compliance
Reputation	Planning	Politcal / Reputational



Figure 2: Airbase operations and equipment

locations with other users under various leasing and licensing arrangements.

Airbases have been a critical part of Victoria's firefighting infrastructure for many years, but the needs and usage of these sites has evolved over time. The infrastructure is aging and becoming increasingly expensive to build and maintain. Modern aircraft are larger, heavier, and faster, increasing their capability on the fire-line, but also the size and scale of infrastructure needed to effectively support them. DEECA manages and maintains airbase assets through a decentralised, region and district model with varying approaches across different areas. While this system has been effective to date, it provides limited statewide visibility and data for risk assessment, assurance, efficiencies, and continuous improvement.

In applying the Asset Strategy Reform Framework in Airbases, DEECA developed a risk-based approach to prioritise assets and management activities, ensuring the best use of resources given the current financial constraints. The approach for airbases includes several key steps:

1. **Categorising Assets:** Airbases contain 29 different types of assets, but not every base has all of them, and not every asset is equally critical for operations. Four airbase standards have been defined, each with different minimum asset combinations to support the intended aviation activities.

2. **Assessing Failure Scenarios:** For each asset type, failure scenarios were analysed to determine the potential impact. The focus was on specific risk events — whether an issue would shut down an airbase or could be managed with a workaround and the potential length of the shutdown.

3. **Managing Risks Consistently:** Activities such as inspections, condition monitoring, servicing, and spare parts storage mitigate the identified risks and are being standardised across the state to ensure coordinated risk management and good assurance on practices in place.

4. **Improving Governance and Coordination:** A new organisational structure has been implemented, strengthening the role of a single Asset Class Manager and with clear linkage to asset governance forums. While airbase operations remain decentralised, key roles are identified, and new forums are fostering consistency and knowledge sharing across all regions. The Airbase Asset Class Management Plan has been updated, an improvement action plan created, and these plans will be owned and delivered by the Asset Class Manager and associated governance committee.

Throughout this approach to airbase asset management, risk assessment and management practices are aligned with the Corporate Risk Framework, ensuring senior leaders can understand and manage risk using the same terminology and processes applied across the department. Applying this approach is occurring in parallel with enhancement of asset data to improve the information available to guide and govern asset management practices. The dataset collected is also risk-based and identified as a means to drive decision-making and a clearer picture of what assets are located where, how they are performing, and where further intervention is needed.

Framing activities from a risk perspective allows for greater consistency, streamlined operations, and application of learnings to continually improve. It also strengthens our forward planning and ability to

justify future investments – showing the effective management of existing assets and a clear picture of the resourcing and operations required.

4 REGIONAL OFFICES AND WORK-CENTRES

DEECA delivers a range of activities and services from over 120 regional locations across the state. These include office and meeting spaces, Incident Control Centres, training facilities, shedding for plant, vehicles, and equipment, service and maintenance facilities, and storage of fuels and other dangerous goods. These sites are essential for emergency response, preparedness, and recovery, as well as park management and capital project delivery. They must meet various safety and compliance requirements, including those for hazardous materials and environmental protection.

Management of these facilities has become increasingly complex and costly due to stricter building regulations, evolving asset requirements, and global price increases, particularly since before COVID-19. Many locations are also shared with other agencies, each operating under management models relevant to their ownership structures. As such, prioritisation and progression of major and minor capital projects vary, and regional teams find it challenging to identify and progress projects with a consistent, fit-for-purpose approach across all sites in their region and statewide. Local solutions are working well but require more time and resources to develop and implement compared to a statewide approach. They also reduce statewide visibility and make long-term infrastructure planning across the system more challenging.

By thoroughly reviewing current practices and challenges, the Asset Strategy Reform project for regional facilities is streamlining site assessments with a statewide, risk-based approach. DEECA has codified 13 key risk areas related to regional facility assets, covering all identified potential issues and gaps in functionality. These risk areas, along with their mitigations and ratings, now form the foundation for standard site-level assessments at all locations. A structured review process will ensure sites remain safe, compliant, and fit for purpose while providing clear visibility of outstanding risks and gaps.

The framework takes a comprehensive approach by integrating various asset risks — including safety, environmental impacts, and the protection of vehicles and equipment from damage or loss — into a single, cohesive model. It is being applied consistently across all ownership structures, providing a unified, statewide view of the sites DEECA uses. This enhanced visibility allows for more effective, timely identification of gaps and issues causing an impact on safety, compliance, service delivery, reputation, or other risk areas. By strengthening oversight, it ensures better risk management, improved mitigation strategies, and a more structured approach to resolving issues.

To create this framework and deliver the site-level assessment, a cross-functional working group was formed, representing users, facilities managers, and an asset strategy manager with input from our executive leadership at key points for guidance. The working group delivered:

1. **Holistic facilities risk register:** Through facilitated risk workshops with key stakeholders, DEECA created a register of regional facility specific risks, determined likelihood and consequence ratings, defined mitigations, and assessed the mitigated ratings. Principles and common terminology from the Corporate Risk Framework were applied.

2. **Site-level assessment survey:** Based on the mitigations identified in Step 1, a survey tool was created to assess a regional site across all potential risks. Rather than conducting a detailed assessment of each asset's condition, a functional assessment determines whether there are any gaps in how risks and the assets are managed (e.g., one question assesses whether there are adequate facilities to clean vehicles, which may be on-site or off-site, depending on the location's requirements).

3. **Standardised approach to common gaps:** Where common potential gaps are identified, DEECA is developing standards to ensure uniform upgrades are delivered across sites to a fit-for-purpose standard (e.g., common design and fit-out of lockers and change rooms).

4. **Prioritised list of facilities projects:** Upon completion of the site-level assessment, identified improvement projects will be prioritised based on cost, the risk rating, and the level of risk reduction. This can be consistently applied across all facilities projects to give a single prioritised view of the project pipeline.

Importantly, this work on regional facilities collates data from various sources and processes into a comprehensive view of regional facility risks, priorities, and future project needs. By evaluating each facility's ability to safely and effectively support critical services, this holistic approach provides a clear framework for informed decision-making and strategic planning of facility projects statewide.

5 KEYS LEARNINGS IN APPLYING ASSET MANAGEMENT REFORMS

Over the course of applying the Asset Strategy Reforms in these asset classes, key learnings have emerged which may be helpful for other strategic asset management practitioners to be successful in delivering long-lasting reforms and create real value for the organisation.

- **Balance consistent principles with a tailored risk-based approach.** Organisations are resource constrained and cannot implement every ideal asset management activity. In addition, engagement drops at all levels when asset management is seen as highly conceptual or purely about compliance. To unlock value, practices need to be implemented with consistency but also tailored to the specific risks and challenges of the asset.

- **Establish structures and governance to own asset management.** Improving asset management maturity over time requires strong ownership and direction. At DEECA, cross-functional governance forums, in collaboration with dedicated asset management and strategy roles, have been essential in driving sustainable change, particularly for the CPS asset class.

- **Create clear roles and responsibilities and a forward plan of action.** Engagement across multiple parts of the organisation is critical to support maturity uplift and this means clear accountabilities and a shared understanding of performance targets. When DEECA's approach to airbase assets was refreshed, the improvement action plan was a critical part of communicating what is to be done now versus later, and how all the pain-points raised by stakeholders would be addressed.

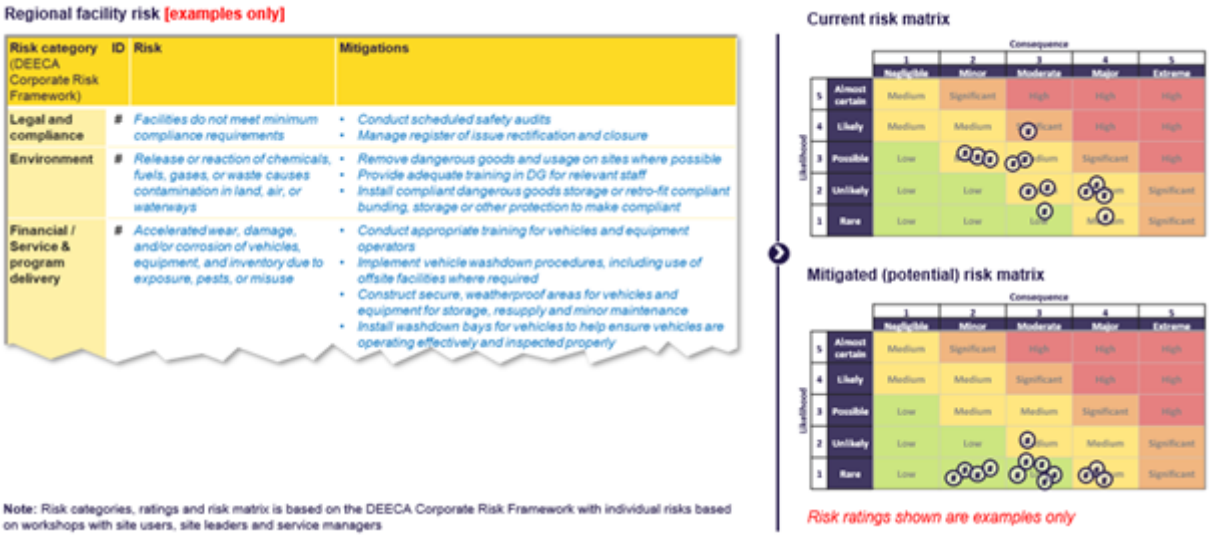


Figure 3: Summarised view of facilities risk assessment and current and mitigated risk rating framework

- **Improve asset data when there is a compelling purpose for it.** Uplifting data quality is a never-ending battle for many organisations. DEECA is focused on making data-driven decisions to address asset information needs. This approach not only secures support for information collection but also ensures processes are in place to maintain completeness and accuracy over the long term.

Further learnings and insight on DEECA's Asset Management Reform journey can be found in the September edition of The Asset Journal, "Asset Management as a Strategic Capability to Deliver Business Value" (Ho et al., 2024).

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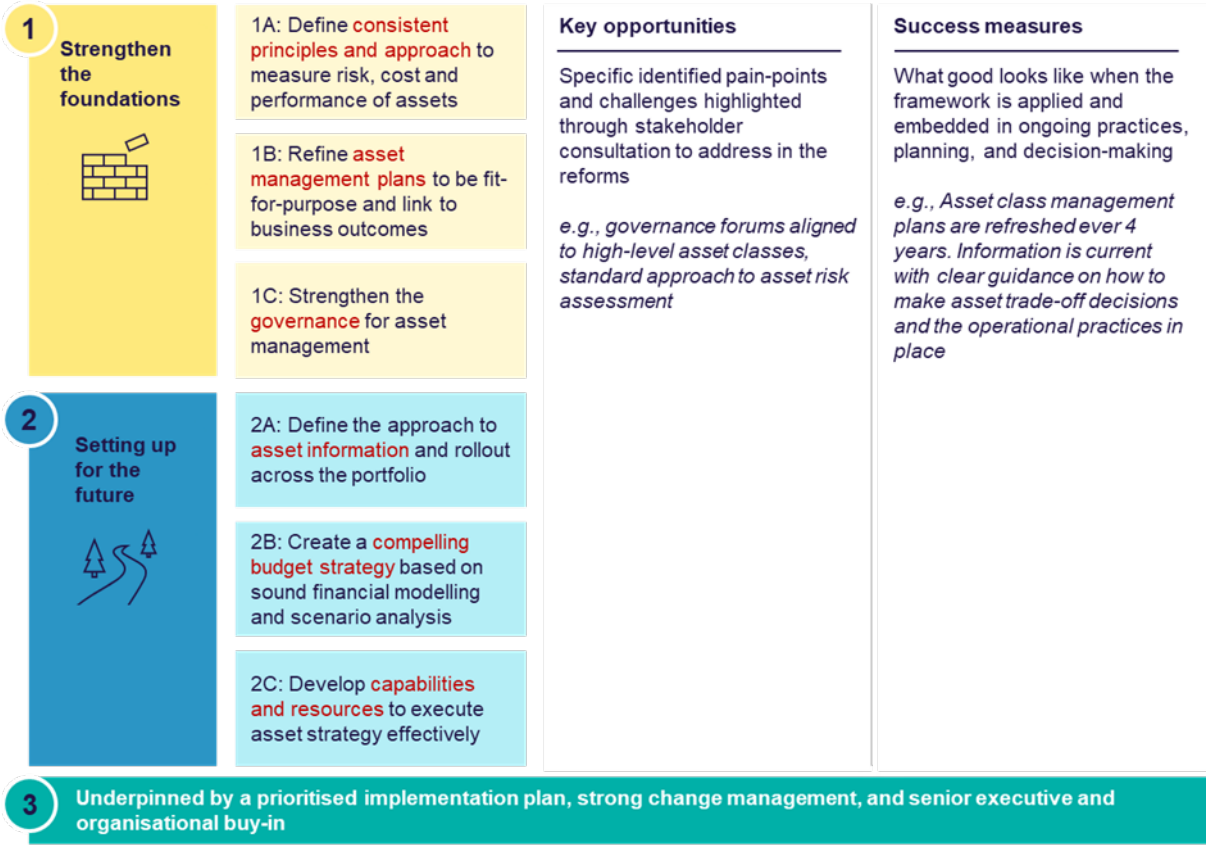
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APPENDIX – ASSET STRATEGY REFORM FRAMEWORK – HIGH-LEVEL SUMMARY



TECH 3



ARTICLE 3 – Coupling Best Practice with Emerging Technologies to Meet Asset Management Challenges for Sustainability and Resilience

Erik Vandenberg & Peri Albert, Verbrec

SUMMARY

The Energy Trilemma, of balancing energy security, energy equity, and environmental sustainability, represents the most significant asset management challenge of our era. Regardless of one's stance on climate science, there is a pragmatic and growing consensus on the necessity to mitigate human-induced carbon emissions. This paper delves into how asset management principles, when synergised with emerging technologies, can effectively reduce scope 1, 2, and 3 emissions, thereby contributing to a lower carbon footprint, and improve resilience, from energy generator through to the consumer.

The paper will explore the integration of advanced asset management frameworks with innovative solutions enabled by new technologies including the Internet of Things (IoT), and artificial intelligence (AI), among others. These technologies offer transformative potential in monitoring, optimising, and managing assets to enhance sustainability and resilience. The paper will present a series of case studies exemplifying successful implementations across various sectors, highlighting some tangible benefits and lessons learnt, with an important focus on getting technology options analysis and selection right, to minimise failed initiatives. It will also provide lessons around the importance of human change management in asset management technology projects.

Furthermore, the paper will propose strategic approaches and actionable insights for managers of infrastructure and facilities assets. It will outline practical steps for leveraging asset management and emerging technologies to bolster the sustainability and resilience of operations amid the current transitional period. Senior leadership and technical asset management professionals engaged with complex and critical infrastructure assets will find this paper particularly relevant.

In summary, this underscores the pivotal role of asset management in addressing the Energy Trilemma and advancing environmental sustainability. By embracing emerging technologies, asset managers can not only meet contemporary challenges but also pave the way for a more resilient and sustainable future. This paper seeks to equip asset management leaders with and strategies to enable them to navigate and thrive in this dynamic landscape.

Keywords: Asset management, artificial intelligence (AI), carbon emissions, change management, digital transformation, energy equity, energy security, Energy Trilemma, environmental sustainability, facilities management, infrastructure resilience, Internet of Things (IoT), optimisation, resilience, Scope 1 emissions, Scope 2 emissions, Scope 3 emissions, strategic asset management, sustainability, technology adoption, technology options analysis, transition to low-carbon economy

1 INTRODUCTION

In the context of escalating environmental concerns and stringent global climate commitments, asset-intensive industries are under increasing pressure to enhance sustainability and resilience in their operations. The imperative to reduce greenhouse gas emissions and achieve net-zero targets has become central to contemporary asset management strategies. This necessitates a harmonious integration of established best practices with emerging technological innovations to effectively address these challenges.

The Paris Agreement, adopted in 2015, serves as a pivotal international accord aimed at mitigating climate change by limiting global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels. This legally binding treaty obligates participating nations to formulate and implement ambitious efforts toward reducing greenhouse gas emissions. In alignment with this global framework, Australia has committed to reducing its emissions by 43% below 2005 levels by 2030 and achieving net-zero emissions by 2050 (United Nations Framework Convention on Climate Change).

To actualise these commitments, the Australian Government has implemented the Safeguard Mechanism (Department of Climate Change, 2025), targeting the nation's largest industrial emitters. Initially introduced in 2016 and reformed in 2023 (de Wit, 2024), this policy sets legislated baselines on greenhouse gas emissions for facilities emitting over 100,000 tonnes of CO -equivalent annually. These baselines are designed to decline predictably and gradually(Gibson et al., 2024), ensuring that covered facilities contribute proportionately to national emission reduction targets (Australian Government Clean Energy Regulator, 2025).

In this evolving regulatory landscape, the role of emerging technologies becomes increasingly significant. Innovations such as artificial intelligence (AI), digital twins, predictive analytics, and the Internet of Things (IoT) offer transformative potential in asset management. Their integration can lead to optimised performance, extended asset lifecycles, reduction of waste, and enhanced decision-making capabilities, all of which are crucial for achieving sustainability and resilience objectives.

This paper explores the convergence of best practice asset management frameworks with cutting-edge technological developments, examining how their integration can effectively address the pressing challenges of sustainability and resilience. By leveraging industry standards, such as ISO 55001(International Organisation for Standardisation, 2024), alongside advanced digital tools and data-driven methodologies, asset managers can enhance reliability, optimise resource utilisation, and develop adaptive systems capable of withstanding both anticipated and unforeseen disruptions. The discussion will highlight case studies and emerging trends that illustrate successful implementation strategies, as well as the barriers and enablers to achieving sustainable and resilient asset management.

Through a critical analysis of contemporary asset management principles and innovative technological applications, this paper aims to contribute to the ongoing discourse on the evolution of asset management in the face of global sustainability imperatives. The findings will provide insights into how organisations can future- proof their asset management strategies, ensuring long-term value creation while addressing environmental, economic, and social challenges.

1.1 Relationship with ISO55001

The integration of best practice asset management with emerging technologies to address sustainability and resilience challenges aligns closely with the principles outlined in ISO 55001. As the international standard for asset management systems, ISO 55001 provides a structured framework that enables organisations to optimise asset performance while balancing cost, risk, and long-term value creation. Several key clauses within the standard are particularly relevant to the pursuit of sustainable and resilient asset management through digital transformation.

Clause 4, which defines the context of the organisation, emphasises the need to consider internal and external factors that influence asset management strategies. In the current global landscape, where climate change, emissions reduction policies, and regulatory pressures such as the Paris Agreement and Australia's Safeguard Mechanism shape operational imperatives, organisations must integrate these considerations into their asset management approach where relevant(Kerr, 2024). This requires a proactive response, leveraging digital innovations such as artificial intelligence (AI), the Internet of Things (IoT), and predictive analytics to enhance decision-making and optimise resource use.

Strategic planning, as outlined in Clause 6, is essential to aligning asset management objectives with sustainability goals. The increasing demand for decarbonisation necessitates a shift towards intelligent asset management solutions that support predictive maintenance, optimise energy consumption, and extend asset life cycles. Emerging technologies play a critical role in ensuring that asset management strategies remain adaptable, data-driven, and aligned with national and international commitments to emissions reduction.

The successful implementation of sustainability-driven asset management strategies is contingent on the principles outlined in Clause 7, which focuses on support mechanisms such as competence, communication, and technological capability. The adoption of digital tools must be accompanied by appropriate training and upskilling of asset management professionals to ensure that technological advancements translate into tangible operational improvements. Additionally, effective communication with stakeholders, including regulators, investors, and the wider community, is essential to demonstrating progress towards sustainability and resilience objectives.

Operational execution, as detailed in Clause 8, underscores the importance of integrating sustainability principles within the entire asset lifecycle. The shift towards proactive asset risk management, enabled by digital twins, AI-driven analytics, and real-time condition monitoring, enhances an organisation's ability to mitigate risks associated with climate change, resource scarcity, and regulatory compliance. Predictive technologies allow for optimised maintenance strategies, reducing unplanned downtime, minimising emissions, and improving asset efficiency.

Ensuring the effectiveness of these strategies requires ongoing performance evaluation, as outlined in Clause 9. Monitoring and measurement frameworks that leverage real-time data analytics and automation enable asset-intensive industries to assess their sustainability impact and compliance with emissions targets. The continuous assessment of asset performance is essential for identifying improvement opportunities and ensuring that net-zero and climate resilience targets remain achievable.

Finally, Clause 10, which focuses on continual improvement, highlights the necessity of adapting asset management practices in response to emerging challenges and technological advancements. Organisations must remain agile, integrating evolving digital solutions to enhance sustainability performance, meet regulatory requirements, and future-proof their asset portfolios. By embedding a culture of continuous innovation, asset managers

can drive long-term improvements in efficiency, resilience, and environmental responsibility.

Through the lens of ISO 55001, the convergence of best practice asset management and emerging technologies represents a strategic imperative for organisations seeking to navigate the complex challenges of sustainability and resilience. By aligning with the standard's structured approach, asset managers can leverage digital transformation to optimise asset performance, comply with regulatory obligations, and contribute meaningfully to global emissions reduction efforts.

2 CASE STUDIES

The Energy Trilemma, which seeks to balance energy security, energy equity (affordability), and environmental sustainability, presents one of the most significant challenges in modern asset management. While the debate surrounding climate science continues, there is a growing consensus on the importance of reducing human-induced carbon emissions. Asset management, in conjunction with emerging technologies, plays a crucial role in mitigating Scope 1, 2, and 3 emissions while enhancing resilience throughout the energy supply chain.

The Energy Trilemma is fundamentally an asset management challenge. Several areas of asset management, including lifecycle cost analysis, risk-based process safety, and performance optimisation, are essential for addressing this complex issue. Effective energy system management requires balancing costs (affordability), ensuring performance (energy security), and mitigating risks (environmental and human harm), the very pillars of asset management. By applying structured management frameworks such as ISO 55001 and leveraging systems engineering methodologies, energy operators can optimise resource allocation, minimise lifecycle costs, and enhance resilience. Ultimately, the transition to a sustainable energy future hinges on integrating asset management principles to systematically manage risks and performance, reinforcing that the Energy Trilemma is not just an energy policy issue but a core asset management problem (Vandenberg, 2024).

This paper explores how asset management frameworks can be integrated with innovative technologies such as the Internet of Things (IoT) and artificial intelligence (AI) to optimise asset performance. A series of case studies will highlight successful implementations, shedding light on technology options analysis, change management, and key lessons learned.



Figure 1: Correlation between Asset Management and the Energy Trilemma (Vandenberg, 2024)

2.1 Theoretical Framework

Asset management provides a structured approach to managing infrastructure and industrial assets, ensuring their reliability, efficiency, and sustainability. Emerging technologies enable real-time monitoring, predictive maintenance, and data-driven decision-making, significantly improving operational efficiency and sustainability outcomes. These advancements can be categorised into:

- **Digital Transformation:** The integration of AI, IoT, and digital twins to enhance asset performance.
- **Predictive Maintenance:** Leveraging machine learning and real-time data to prevent failures.
- **Sustainability Tracking:** Using software solutions to track and optimise carbon emissions.
- **Workforce Efficiency:** Digital solutions to enhance productivity and reduce reliance on manual processes.

The following case studies provided, from some industry affiliates and clients illustrate how these principles have been successfully applied across different industries.

2.2 Case Study 1 – Fortescue: WorkMate and SAP for Digital Work Management

Context and Challenge

Fortescue identified inefficiencies in work management processes, primarily due to reliance on paper-based workflows and manual reporting. These inefficiencies resulted in increased travel time, administrative burden, and delays in defect recording.

Solution and Implementation

WorkMate, a digital solution integrated with SAP Service and Asset Manager, enabled mobile-based execution of work processes. The technology allowed real-time defect recording, improved data accuracy, and enhanced user experience for maintenance teams.

Outcomes and Impact

Inspections reduced from an hour to minutes, significantly improving productivity. This translated into a projected annual savings of 64,031 hours through reduced travel and administrative burden. This is equivalent to a headcount reduction of 4 FTEs in a single department.

Relevance to the Energy Trilemma

By optimising asset management workflows, Fortescue has enhanced energy efficiency and reduced waste, contributing to both energy security and environmental sustainability.

2.3 Case Study 2: Sustainability Assessment of Asset Management - Decisions for Wastewater Infrastructure

Context and Challenge

This case study(Mohammadifardi et al.), demonstrated the application and utility of a developed System Dynamics model to assess the sustainability of strategic decisions for managing the wastewater collection pipe network system for a medium-size municipality in Southern Ontario, Canada. The municipality manages an extensive wastewater pipe network exhibiting varying levels of degradation. The study assesses multiple asset management scenarios to determine their financial, environmental, and social impacts over a 100-year simulation period.

Solution and Implementation

The study compared the effects of 2 different rehabilitation strategies on infrastructure condition, financial sustainability, and GHG emissions.

1. Scenario 1 - Baseline Rehabilitation

a. Limits the fraction of severely deteriorated pipes to 10% of the total network length.

2. Scenario 2 - Accelerated Rehabilitation

a. More aggressive approach, maintaining severely deteriorated pipes below 2.8% of network length.

Outcomes and Impact

The accelerated rehabilitation strategy results in lower total costs for both residents and the municipality compared to the baseline scenario. Figure 2 shows the total GHG emissions generated for both scenarios, over a 100-year period. Note: WWC refers to wastewater collection, WWT refers to wastewater treatment and WC refers to water distribution.

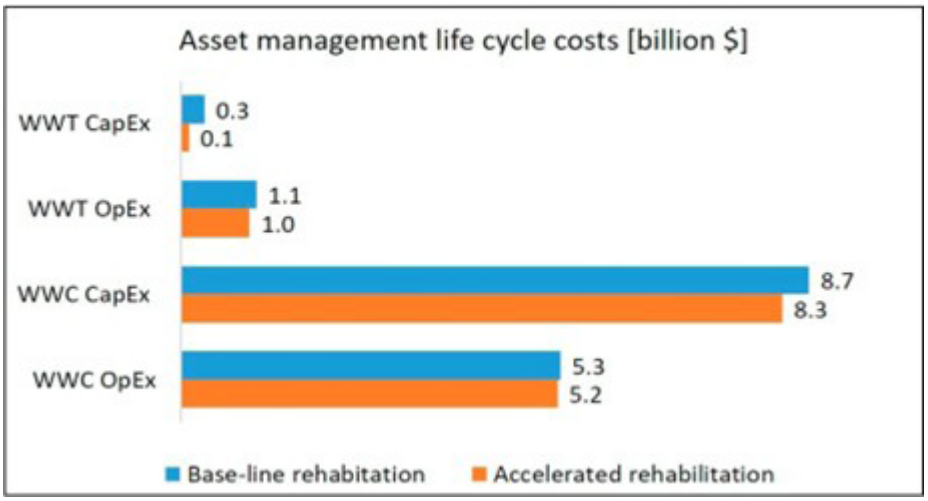


Figure 2: Asset management life cycle cost components for wastewater assets

A faster rehabilitation rate reduces extraneous inflow and infiltration, leading to lower GHG emissions and reduced need for wastewater treatment plant expansions. This is displayed in Figure 3.

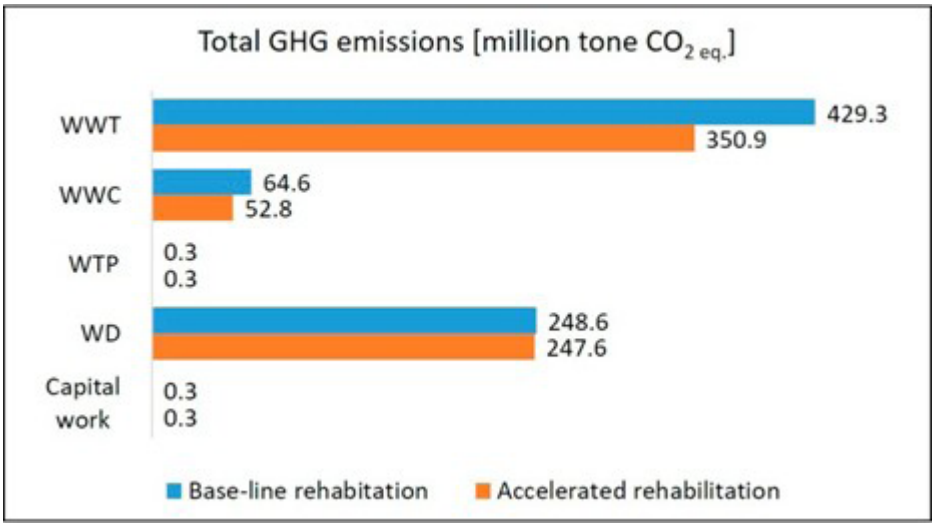


Figure 3: Total GHG emissions from different scenarios

Relevance to the Energy Trilemma

Over time, both strategies ensure financial self-sustainability, but the accelerated strategy achieves greater cost savings and environmental benefits. The study highlights the importance of integrating wastewater collection and treatment infostructure systems to identify synergistic cost-saving opportunities and reduce GHG emissions.

2.4 Case Study 3: I-Care - Predictive Maintenance in Manufacturing

Context and Challenge

Manufacturers like Barry Callebaut and BASF faced unexpected machine failures, leading to downtime, inefficiencies, and safety risks. A proactive maintenance solution was needed.

Solution and Implementation

I-care deployed Wi-care sensors and the I-see platform to monitor machine health through vibration and temperature analysis. Predictive analytics enabled timely interventions before failures occurred.

Outcomes and Impact

The outcomes of implementing these proactive solutions were numerous, including

- Barry Callebaut avoided 30 hours of downtime per cacao grinder, equating to cost savings of 150,000 per machine.
- Increasing the lifespan of Thouet gearboxes from 3 months to 2 years.
- BASF prevented a spontaneous bearing failure that could have posed a major hazard.

Relevance to the Energy Trilemma

By preventing failures and optimising equipment performance, I-care's solutions contribute to energy security and efficiency while reducing waste and emissions. Furthermore, they have enhanced safety measures by proactively identifying and addressing potential bearing failures before they occur.

2.5 Case Study 4: IFS - Asset Management for Energy and Aviation Sectors

Context and Challenge

China Airlines and Elvia identified they required an advanced asset management system to improve efficiency, regulatory compliance, and sustainability tracking.

Solution and Implementation

IFS Cloud provided an integrated asset management solution that streamlined planning, execution, and compliance while embedding AI, ML, and IoT capabilities.

Outcomes and Impact

China Airlines achieved a 65% reduction in multi-crew job card waiting time. Elvia leveraged IFS Cloud to improve decision-making and optimise energy distribution. This produced increased revenue due to optimised aircraft maintenance.

Relevance to the Energy Trilemma

IFS Cloud enables energy and aviation industries to improve sustainability through data-driven decision-making and operational optimisation.

2.6 Case Study 5: A framework for asset management planning in sustainable and resilient cities

Context and Challenge

This case study,(Rebecca Dziedzic et al.), presents a comprehensive set of strategies designed to support sustainable and resilient asset management planning for civil infrastructure. The study primarily focuses on municipal assets, including water, wastewater, and drainage systems, as well as road networks and buildings. Drawing on innovative and holistic approaches, it proposes a framework of best practices for effective asset management.

Solution and Implementation

This case study identified a 9-step guide to developing an asset management system. It identifies best practice and innovations throughout each step. Such innovations across these steps include

- Predict deterioration
  - o Apply big data and machine learning to predict deterioration

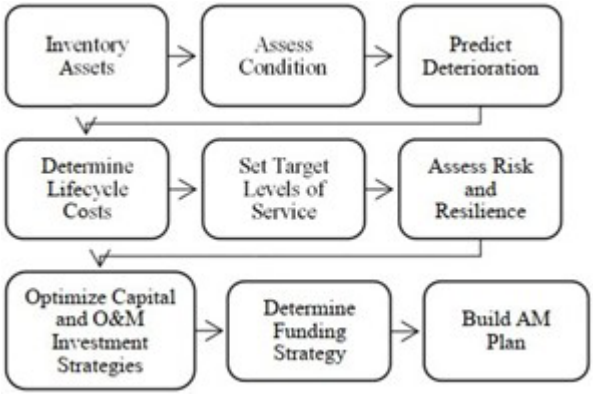


Figure 4: A 9-step guide to developing as asset management system

- Set target levels of service

  o Applying the IoT, through sensors and actuators, can provide monitoring of assets and immediately detect anomalies. Smart Multi-purpose Utility Tunnels (SMUT) provide an excellent example of IoT applications in managing underground assets (Luo et al., 2020), (Alaghbandrad and Hammad, 2020), (Luo, 2020).

Outcomes and Impact

Several improvements in operational efficiency and reduced GHG emissions are evident in the application an asset management framework. software-based solutions rely on operational changes that can leverage machine learning or data-mining



Figure 5: Typical Options Analysis and Selection Process (Vandenberg, 2025)

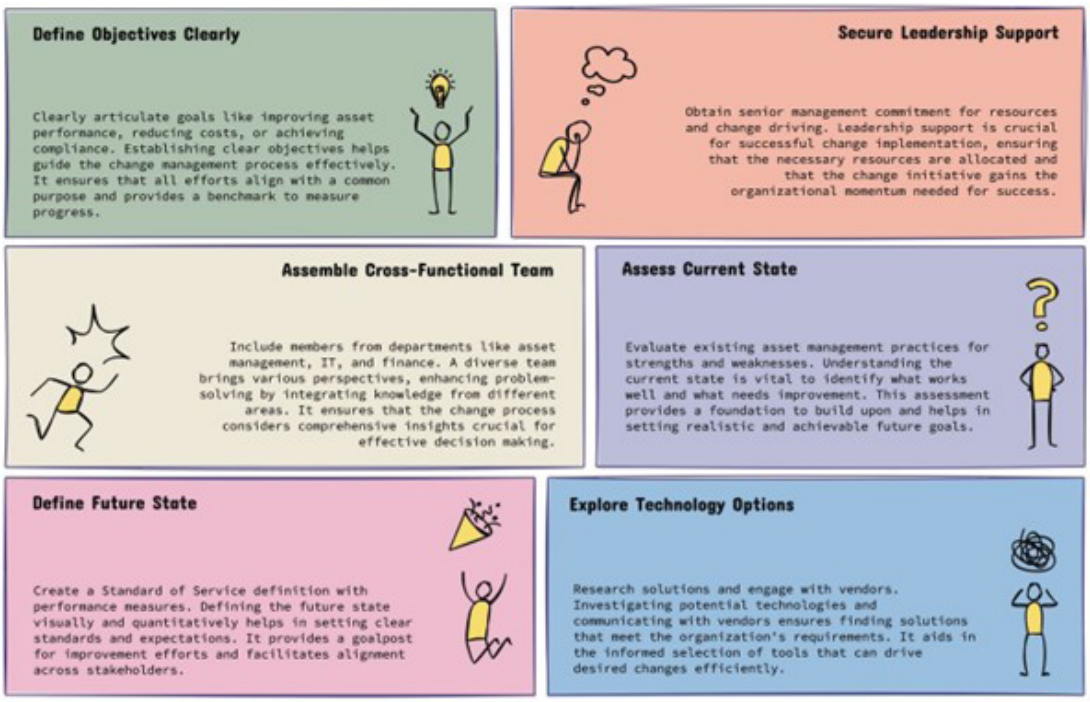


Figure 6: Typical Change Management Steps (Vandenberg, 2025)

algorithms. For example, automated fault detection and diagnostics in building operations has been shown to reduce energy consumption by up to 40% (Shen et al., 2017).

Furthermore, novel strategies for smart and data-driven control of building systems can significantly optimize operations. Examples of these technologies include model-based predictive controls (MPC) and occupant- centric controls (OCC) which analyse buildings' internal and external disturbances to adjust their operation accordingly in real-time and were found to reduce energy consumption by up to 30 – 60% (Killian and Kozek, 2016), (Park et al., 2019).

Relevance to the Energy Trilemma

These reduction in energy consumption directly translate to a reduction in cost and GHG emissions.

3 RECOMMENDATIONS AND CONCLUSION

The case studies presented demonstrate the critical role of asset management frameworks and emerging technologies in addressing the Energy Trilemma. By leveraging AI, IoT, predictive maintenance, and digital twins, organisations have successfully enhanced energy security, reduced emissions, and improved operational efficiency.

The key takeaways from carrying out a significant number of Asset Management capability uplift and solution options analysis, selection, and implementations include:

Technology Selection Matters: Choosing the right tools ensures successful integration and long-term benefits. Based on lessons learned throughout carrying out multiple Asset Management capability uplift processes that typically lead to a technology selection and implementation, we find that a suboptimal initial selection process almost certainly leads to significant cost and frustration that could have otherwise been avoided through the application of a robust and exhaustive options analysis and selection process. An overview of the elements of a typical process that should be applied is included below in Figure 5 – Typical Options Analysis and Selection Process (Vandenberg, 2025).



Figure 7: ESG Improvements can lead to financial performance improvements (Authors and DALL-E 2025)

Change Management is Essential: Employee adoption and training play a crucial role in realising technology benefits. One of the most common lessons learned when implementing enabling technologies to uplift asset management capabilities, is to ensure the human change management process is not underdone. Often we find that when clients review proposals for these type of initiatives, they request a reduction.

Sustainability and Efficiency Can Coexist: Digital transformation enables organisations to optimise assets while reducing their carbon footprint. These case studies and other research referenced within this paper confirm that improved sustainability outcomes are typically linked to improved financial outcomes, this will become more prominent as both the costs of energy and emissions rise.

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ARTICLE 4 – Achieving better outcomes through integrated performance, risk and decision-making frameworks

Ankur Maheshwari & Jack Nelson, AMCL and
Ali Walsh, SA Power Networks

SUMMARY

Optimal asset management decisions hinge upon balancing asset performance and associated risks. The application of asset performance management and risk management for asset management is now evident in many utilities. The approaches to this have seen significant improvements driven by stakeholder expectations and, the requirements of technical and economic regulation. However, maturity levels of application vary between organisations. A key differentiating factor is the extent to which these approaches are integrated, i.e. integration of asset performance management, risk management and asset management decision-making. Robust asset management decisions require a decision-making process that:

- is transparent to internal and external stakeholders (no surprises)
- is scalable to all decisions across the asset management landscape
- integrates asset performance risk and decision-making frameworks
- aligns with the asset management objectives

- strengthens the line of sight between actions and objectives
- clearly reflects its maturity level
- makes the best use of data, information, and knowledge to make informed decisions

This paper discusses an end-to-end asset management decision-making framework developed by SA Power Networks and AMCL Pty. Ltd. The decision-making framework integrates multiple complex business capabilities. It can be applied to all asset management decisions and has laid the foundation for future asset management improvements at SA Power Networks.

Using a case study, the paper discusses how the new decision-making framework was tested to review an existing asset strategy concerning a key safety objective. As a part of this case study, we:

- defined how the asset performance management framework can be applied in a structured manner
- analysed asset performance data to review co-relationships between asset condition, asset incidents and asset management objectives
- utilised the performance analysis information to test our understanding of risks (consequences as well as likelihood)

We were able to identify existing business rules that should be selected for further review, to drive improved performance. As these frameworks are applied over the time, they will enable improvements in efficiency and effectiveness from investments.

The paper demonstrates the benefits of applying a structured approach and integrating performance and risk frameworks to drive transparent and informed asset management decisions. Integrated Performance-Risk and Decision-Making frameworks is expected to maximise value from investments and deliver optimal outcomes for stakeholders. The work completed has established a strong foundation to enable improved asset management decisions at SA Power Networks.

Keywords: Asset Management, Decision Making, Performance Management, Risk Management, Framework

1 INTRODUCTION

The importance of decision-making in asset management is well established. The latest revision (2024) of ISO 550014 reinforces this with a specific section on Asset Management decision-making. It outlines the requirement to:

- establish and apply a framework for asset management decision-making.
- define and determine the value that the organisation aims to derive
- define the decision-making criteria that the organisation would use to derive value from its assets and operations.

The decision-making framework should apply across all stages of the assets life cycle and be supported by adequate governance for appropriate, and timely, decisions and the implementation of those decisions.

ISO 55001 typically expects that:

- the decision-making criteria should be aligned with organisational objectives
- the asset management plans are developed using the decision-making framework
- data and information requirements to enable decision-making are identified
- knowledge is readily accessible at the time of decision-making
- the relationship of asset condition to performance, opportunity, risk and cost are understood to guide decisions in relation to predictive actions to be taken on assets, asset management, and the asset management system
- the organisation reports to relevant stakeholders on the long-term effect of the decisions that were made

Key challenges in respect to decision-making frameworks and their application within most organisations include:

- poorly defined asset management objectives
- decision-making criteria not formalised, or is inconsistently applied, across the asset life cycle, including sometimes inadequate access to, or awareness of this criteria

- multiple layers of decision-making that are not always based on the same criteria – for example different criteria drive asset strategy, investment planning, asset construction, maintenance, and operations
- misalignment or lack of connectivity between performance, risk and decision-making frameworks

SA Power Networks was no different, they faced the above challenges to varying degrees. As a first step establish a structured approach to decision-making, we defined a framework that integrates asset management objectives, performance management, and risk management. The work related to asset management objectives and the overall Asset Management System Map are covered in a separate paper titled "Establishing and Fostering Alignment and Coordination in Asset Management".

For our case study, we evaluated the approach of an integrated performance – risk – decision making framework applied to an existing safety control. We were able to demonstrate the benefit of moving to this new approach, paving the way for further application and implementation at SA Power Networks.

This paper introduces the integrated approach that we applied, actions taken to implement the approach, outcomes we achieved, learnings and the next steps associated with the development of the performance-risk-decision making framework. Noting that deployment of these frameworks requires an organisation to commit to new ways of doing business and continually improving them over the time.

2 OVERVIEW OF THE INTEGRATED APPROACH

Four closely connected key elements are required to drive maximum value from the assets, asset management and the asset management system.

These are shown in Figure 1 and include:

- Asset management objectives
- Decision-making framework
- Performance Management framework
- Risk Management Framework



Figure 1: Key elements that underpin Asset Management Decision-Making

For the organisation to make informed decisions, these frameworks need to be underpinned by:

- Business Processes
- Data and Information
- Systems and Technology
- Business Rules

Figure 2 shows high level view of the application of decision-making frameworks for AM decisions including the Strategic Asset Management Plan (SAMP), Asset Lifecycle Strategic Plans and Lifecycle Delivery activities.

The overall rationale behind the integration of these frameworks is summarised below:

- **Asset Management Objectives:** The Asset Management Objectives must align with Corporate Objectives and represent stakeholder requirements. They define what Asset Management needs to deliver. This is the most crucial leg of the tripod on which the decision-making framework stands. The entire purpose of decision- making is to deliver on the objectives
- **Performance Management Framework:** The Asset Performance Management Framework provides the ability to monitor performance against the objectives and is a feedback loop to provide insights into over- or under-performance. It also allows mapping of the performance of assets and how they impact on the achievement of the objectives. It provides actionable insights into decision making. It provides the necessary input to the risk management framework.

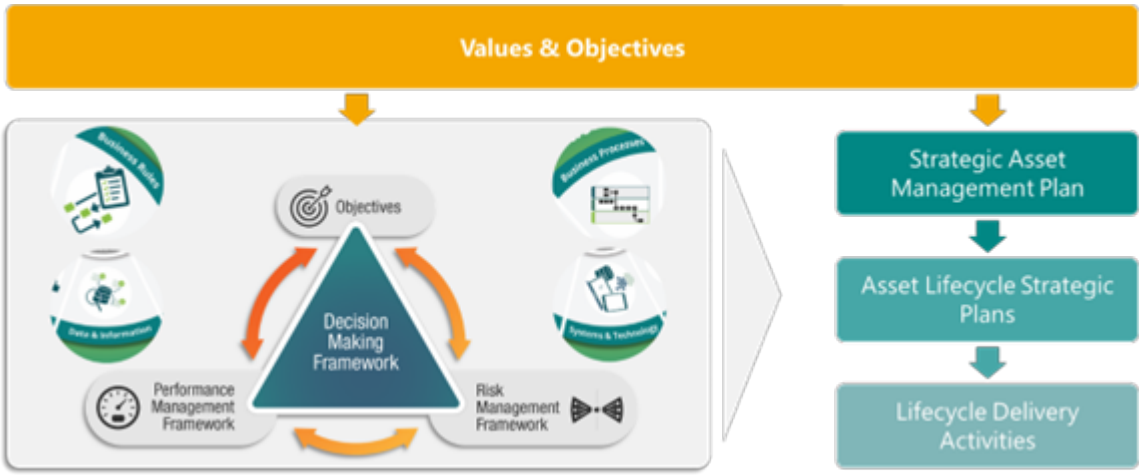


Figure 2: Application of decision-making frameworks

- **Risk Management Framework:** The risk management framework makes it possible to assess current and forecast risks against the objectives. It relies on information from the performance management framework to assess likelihood of failure, likelihood of consequence, and cost of consequence. The risk framework provides inputs to the decision-making framework to drive risk-based asset management decisions.
- **Decision Making Framework:** The decision-making framework utilises the information on present and forecast performance and risk and enables decision making across the entire asset life cycle. It also enables investment optimisation and prioritisation to deliver the most effective investment plan for a given constraint. Decisions are continually reviewed based on feedback from performance and risk frameworks.

The performance, risk and decision-making frameworks, along with highlights of the case study, are discussed below.

3 ASSET PERFORMANCE MANAGEMENT FRAMEWORK

3.1 Key challenges

Some of the key challenges we faced in our approach to Asset Performance Management were:

- **Ad hoc KPI reporting:** this was mostly manual and lacked source data governance
- **Hard to "join the dots":** Required effort to decipher how individual assets or processes contribute to overall asset management objectives
- **Hard to make informed decisions:** Required effort to identify where additional focus would be required to improve outcomes
- **Lack of actional insights from performance management:** Insights were not always available from performance management to drive improvement in asset management decisions

3.2 What was delivered and How?

The overall objectives of the Asset Performance Management Framework were to "**Develop actionable insights of asset performance to enable informed asset management decisions and measure the effectiveness of asset management strategies and plans.**"

As a part of this project, we developed the:

- **Asset Performance Management Framework:** The asset performance management framework is a key component of SA Power Networks Asset Management System and includes the processes, structure and measures used to understand the performance of SA Power Networks Asset Portfolio and its impact on

corporate objectives. It includes a documented processes that defines how we measure the performance of assets and the Asset Management System.

- **Asset Performance Management Hierarchy:** This is a hierarchical structure enables SA Power Networks to measure the contribution of assets to overall objectives. It facilitates the deconstruction of the overall impact into its causal hierarchy, establishing a clear line of sight between asset condition and performance with the asset management objectives. This enhances our ability to measure performance in a structured way for both assets and the asset management system.

The case study focussed on applying the framework to review our understanding of the various causes for an asset management objective and to monitor trends on how this has changed over many years. The case study allowed us to demonstrate performance management techniques and processes. The case study examined safety performance, focussed on the impact of a selected asset class on the selected safety objective. It was sufficiently developed to provide actionable insights into the behaviour of the network.

3.3 Benefits and Outcomes

- A structured approach to measuring and managing performance was defined, including an implementation plan to implement the framework across all assets/ asset systems and objectives
- The performance framework provides actionable insights to make, implement and monitor asset investments. It provides a continuous feedback loop that can enable measurement of effectiveness and efficiency of asset management decisions
- A structured approach to measuring and managing performance was defined, including an implementation plan to implement the framework across all assets/ asset systems and objectives
- The performance framework provides actionable insights to make, implement and monitor asset investments. It provides a continuous feedback loop that can enable measurement of effectiveness and efficiency of asset management decisions

4 ASSET RISK MANAGEMENT FRAMEWORK

4.1 Key challenges

Some of the key challenges we faced in our approach to Asset Risk Management include:

- Lack of complete alignment between corporate risk framework and asset risk management: We wanted to be able to understand how the corporate risk framework applies to asset management decisions
- Inconsistent application: Not all our decisions were risk based. We were not able to compare all investments on an "apples for apples" basis
- Quantification of risks: We wanted to quantify and compare risk to support decision making. If we made risk value visible, we could drive good decision making and communication to stakeholders
- Measurement of risk reductions from investments: We had no process for managing the achievement of objectives

4.2 What was delivered and How?

Collaboratively with SA Power Networks subject matter experts, we introduced a range of foundational improvements in our approach to asset risk management. Extensive consultation was undertaken with stakeholders including gathering information about existing risk management measures, processes etc. We assessed how risk management techniques were applied at SA Power Networks across the asset lifecycle.

- We updated our current value framework to cover elements that went beyond the regulatory needs and could be used to value and compare investments within the scope of the AMS (Asset Management System)
- We defined a process for understanding the things that may impact on the achievement of objectives and how to manage this impact
- We prepared a template risk management framework aligned with requirements of ISO 31000 and ISO 55001.

- We included specific requirements that were required to assess and manage safety risks

As a part of the case study process, we tested if the risk assessment process utilises actual incident, asset condition, asset deterioration curves and alike for the purpose of measuring likelihood and consequence. We used the data analysed as a part of performance framework to assess how that might affect the view of risk when applied. This integration of performance and risk framework is a key improvement that needs to be pursued to further improve the maturity of risk management at SA Power Networks.

4.3 Benefits and Outcomes

As a part of this work we delivered a Network Risk and Value Framework that is aligned with Corporate Risk Framework and when applied:

- will enable SA Power Networks to better identify, analyse, evaluate, mitigate and monitor the risks of not achieving network asset objectives
- will provide improved network safety outcomes through enabling greater compliance with the regulatory requirement to implement and maintain an Electricity Network Safety Management System (ENSMS) in accordance with Australian Standard on ENSMS (AS5577)
- provides the ability to apply a consistent view of risk across the scope of the Asset Management System (AMS) which supports subsequent work to develop prioritisation methods
- provides the ability to identify the issues that may impact on the achievement of objectives and develop asset management measures, both operational and investment-related, that mitigate the negative impacts of failing to achieve objectives
- provides the ability to articulate the real-life consequences of constrained expenditure and the expected outcomes of decisions on a long-time scale

5 ASSET MANAGEMENT DECISION-MAKING FRAMEWORK

5.1 Objective

- To instil a robust, structured framework for decision-making to improve consistency, transparency, reduce leadership oversight, and support people to make the right decisions aligned with Asset Management Objectives
- To ensure robust, transparent, and informed decision-making that aligns with Asset Management Objectives, optimising asset performance, managing risks, and maximising value sustainably across the business

5.2 What was delivered and How?

- We delivered an approach for developing decision making processes in a structured, consistent manner across asset lifecycles to sustainably achieve Asset Management Objectives
- A decision matrix was prepared that summarised all decision-making processes applied across the asset lifecycle. For example – decision-making for network planning, network expansion and reduction, equipment selection, specifications of equipment, selection of a contractor etc. These decision-making approaches will progressively apply a consistent approach of performance and risk analysis, aligned with the asset management objectives

The case study demonstrated that the decisions on interventions required to mitigate safety risks can be challenged through application of a decision-making framework that relies on an integrated performance and risk framework

5.3 Forecasted benefits and outcomes

Once applied the decision-making framework is expected to deliver the following benefits/ outcomes:

- Predictable decision making following a structured, repeatable approach that improves the outcome by reducing risk
- Improved use of information in decision making
- Improved feedback loops from decision outcome to decision making
- Greater visibility of decisions being made and improved delegation of decisions
- Better decisions over time

6 LEARNINGS AND NEXT STEPS

- In an existing business (brown-field environment), it is very time consuming to take stock of all approaches that are in practice. Numerous practices have come to exist – each developed in a silo and without any connectivity to the others
- Implementation and Change management are major tasks. Whilst the frameworks have been developed, there is always a reluctance to change. Stakeholders provide a natural resistance to change – "if it isn't broke why change"? The project requires a strong desire to change and a strong leadership to drive the change
- The real benefits from the improved approach can only be realised once all decisions are taken through the application of the new approach

In order to realise full benefits from the approach the following steps will be required:

- Development and implementation of a plan to fully apply performance and risk frameworks aligned with the refined asset management objectives
- Training of all personnel involved in decision-making and implementation of the decisions
- Development of tools for optioneering, whole of life cycle cost estimation, end of life management, program optimisation, prioritisation, benefits management
- Development of data and information strategy and plans to improve the robustness of data required to realise benefits from the performance and risk frameworks
- Governance of decision-making frameworks to ensure that the business doesn't fall back to old unintegrated approaches

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ASSET MANAGEMENT COUNCIL

ASSET MANAGEMENT FUNDAMENTALS COURSE

Run online in a live interactive session over two consecutive mornings offers a thorough overview of asset management. The purpose of the Asset Management Fundamentals program is to understand the fundamentals of asset management and how they can provide benefits to the organisation. Please click here to register.
Course learning objectives:

- Define asset management within the context of ISO 5500x suite, the Asset Management Landscape and AMBoK
- Identify the principles that underpin asset management
- Identify available asset management tools and techniques that are applicable within organisational context
- Identify opportunities to apply these learnings to improve individual and organisational performance.

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REFLECTIVE ARTICLE – Observations from 50 years in Asset Management

Retired Fellow Strategic Asset Management
Andrew Sneesby, CFAM, Queensland Australia



This observation draws on my experience working with clients and staff with diverse ranges of asset classes worldwide in infrastructure asset management including *Australia, New Zealand, North America, Canada, United Kingdom, Philippines, and South Africa.*

My experience in Asset Management within Australia has encompassed roles in State and Local Government, and private sector consulting, with projects undertaken across all States.

I have delivered accredited Asset Management Fundamentals Training and Certification Assessments for the Asset Management Council of Australia (CAAM, CPAM, CSAM and CFAM).

This observation seeks to identify key lessons and challenges in managing high value portfolios of infrastructure assets, and to evaluate whether their value and lifespan are being maximised through effective service delivery including:

a. *Are we adhering to best practices in our processes and delivery?*

b. *Do our current funding levels sufficiently support sustainability objectives as we invest in new assets and plan for future growth?*

c. *Are we transferring liabilities to future generations that may not be sustainable?*

d. *Are our operations compliant with applicable legislation and occupational health and safety procedures?*

e. *Have we recognised and involved all stakeholders in the processes?*

f. *Have we developed SAMPs and AMPs to include all assets and documented information?*

Many organisations have systems, hardware, and staff dedicated to asset management. However, forecasting future funding impacts and setting project priorities can be limited due to multiple priorities. Organisational culture also influences how effectively asset management systems operate.

Organisations possess assets like roads, drainage, parks, utilities, and buildings. The public largely notices problems such as potholes, leaks, or flooding rather than internal less visible operations.

Common questions affecting decisions during the budget process:

a. *What is the available funding for new capital projects?*

b. *What funding is designated for asset replacement and refurbishment?*

c. *What are the internal and external strategies for maintenance management?*

d. *Which assets are approaching end of life?*

e. *What are the assets' condition and residual life?*

f. *What are the lifecycle costing strategies (Repair, Renew. Replace) for replacement and/or refurbishment?*

g. *Are we managing reliability, risk, and consequences effectively across all assets, community, and environment?*

h. *Has the potential impact on climate change been evaluated?*

The following factors may explain why budget deliberations can influence decisions and priorities.

a. *Assets are in most instances long lived, and potential issues may not be immediately apparent during the budget cycle.*

b. *Differing departmental/business unit priorities.*

c. *Political factors and influences.*

d. *Inaccurate financial forecasting and unexpected maintenance expenditure.*

e. *Community dissatisfaction in levels of service.*

f. *External funding constraints.*

What actions should be taken?

Asset managers commonly encounter similar challenges. Establishing a more robust, practical process will assist in addressing these issues and aligning other important attributes.

For example:

Many organisations now use advanced, integrated asset management systems. From the expectations of these systems, are we able to predict and accurately assess what is the true consumption of our assets.

Conclusion

Some organisations may already address these issues. The aforementioned can be adapted as needed. My goal is to highlight asset-critical investments that shift organisations from ineffective asset management to object-oriented approaches that have lasting results. Asset Management plays a vital role in Australia's infrastructure and economic sustainability, yet without a unified approach we risk repeating the same oversights without coordinated evolvement.

Andrew Sneesby, CFAM



MEMBER ARTICLE – Asset Cost Management Framework - Use of LCC enable decision-making during asset repair, retrofits, replacement or re-purposing

Yousuf Hasani, APM Terminals, Nederland

Introduction

Here in this article, a management framework is presented for the lifecycle cost (LCC). The approach is meant to assist asset managers as in decisions of repairs, retrofits, replacement or even redeployment or repurposing. The approach is an outcome of implementation in the Port Sector where assets like gigantic Quay Cranes, and CapEx intensive earth moving equipment is being operated, maintained as key enabler in mission critical business operations.

Typical Business Challenges in Asset Cost Management

In today's competitive world where geopolitical situation is changing, and energy transition is reshaping the world, the requirement for the asset-intensive industries, to manage assets at an optimum has become a strategic priority. A typical list of challenges remains common:

- Stakeholders' expectation,
- Need for an optimum asset care program
- Management of resources and
- Others, depending on the business context.

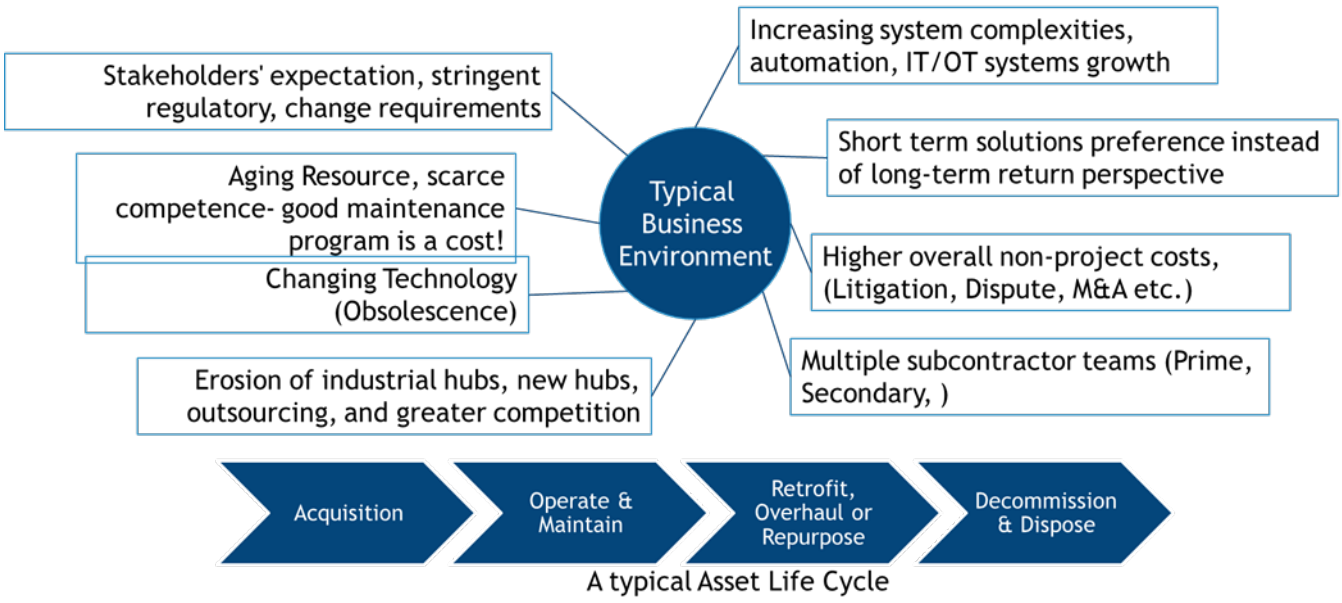
However, it is observed that asset intensive organizations are also recognizing the strategic value of their physical assets beyond traditional maintenance. The shift from reactive maintenance practices to comprehensive proactive with a combination of risk and value-based investments represents a significant evolution. This shift is holistically framed under asset management standards [1]. This transition enhances not only operational efficiency and asset longevity but also aligns asset strategies with broader organizational goals. The core of the modern asset management principles relies in balancing the performance, risks and costs across the asset lifecycle.

What are Lifecycle Costs?

Lifecycle cost (LCC) provides a comprehensive view of the total cost of ownership of an asset from design, selection, acquisition, operation to maintenance and eventual repurposing or disposal. Understanding these costs allows decision-makers to evaluate the financial and strategic implications [2] of each option and align asset strategies with organizational goals. These costs typically include:

- **Construction Costs:** costs like, one off Purchase, installation, commissioning, and initial training costs. The sum of such costs can be referred to the asset acquisition costs
- **Operational Costs:** costs kike, Energy, Fuel, labour, consumables.
- **Maintenance Costs:** costs like, preventive, corrective, breakdowns, condition based or predictive maintenance, with labour and spares.
- **Upgrade/Retrofit Costs/ Relocation Costs:** Costs to improve or modernize the asset or to repurpose the assets costs.
- **Salvage Costs:** Removal, salvage, or recycling costs.

Other costs: Decommissioning/Disposal Costs: externalities, damages, Environmental and Compliance Costs: Costs related to meeting regulatory.



A typical Asset Life Cycle

$$LCC = C_0 + \left[\sum_{t=1}^{T} \frac{OC_t}{(1+i)^t} + \sum_{t=1}^{T} \frac{MC_t}{(1+i)^t} + \sum_{t=1}^{T} \frac{RC_t}{(1+i)^t}\right] - \sum_{t=1}^{T} \frac{SV_t}{(1+i)^t}$$

Where;

C0 represents the sum of Construction costs

OC represents the Operational Costs

MC represents the Maintenance Costs

RC represents the retrofits, improvements Costs

SV represents the Salvage cost, income from scraps

t represents the life (years)

i represents the discount factor

Approach for Lifecycle Costs (LCC)

The life cycle cost analysis can be beneficially performed by a supplier, manufacturer, sales organization, commissioning authority or installer. It can also be performed by the purchaser, user, operator, paymaster, maintainer, or decommissioning authority. Therefore, it is important to have a defined LCC approach, templates with clear roles, responsibilities among wider stakeholders, and identification of sources of data [3]. Figure below provides a general approach for the LCC with sources of data to be used.

Using Lifecycle Costs in Decision-Making Scenarios

1. Repair Decisions

Scenario: as a case, an HVAC system frequently breaks down, causing discomfort and productivity loss.

Lifecycle Cost Insight:

- Analyse historical repair costs, including downtime and resources hours.
- Estimate future costs if the repair trend continues.

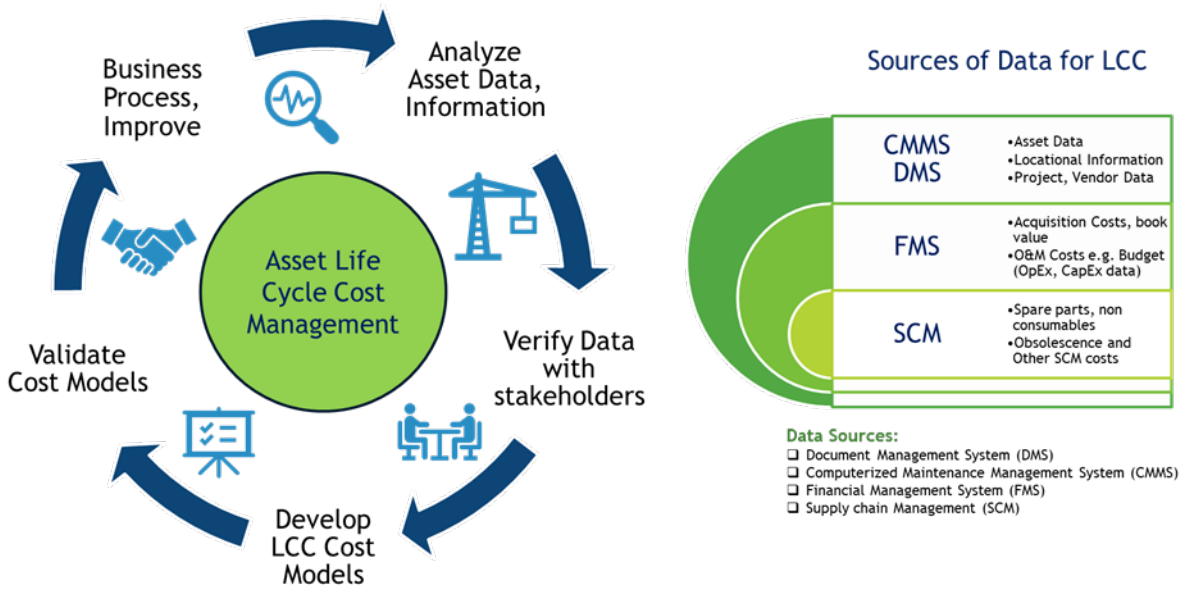


Figure: Asset Cost Management Approach of Lifecycle

- Compare with the cost of replacement or retrofit.

Decision Support

- If future maintenance costs exceed replacement cost over a given period, replacement may be justified.
- If the asset is still within its expected life and has low future failure risk, repair may be the better option.

2. Retrofit Decisions

Scenario: As a case, if in a manufacturing line runs on outdated controls, leading to inefficiencies and difficulty sourcing spare parts.

Lifecycle Cost Insight:

- Evaluate retrofit cost vs. the cost of operating an inefficient system.
- Factor in productivity improvements, energy savings, and extended useful life.

Decision Support:

- Retrofits with short payback periods and significant lifecycle savings are often preferable to full replacement.
- If retrofitting doesn't address major performance or compliance issues, it may be a temporary fix.

3. Replacement Decisions

Scenario: As a case in an aging fleet of Container Handling Equipment (e.g. UTR vehicles) incurs increasing fuel and maintenance costs.

Lifecycle Cost Insight:

- Compare cost of continued ownership (fuel, downtime, emissions penalties) with the total cost of a new fleet (including financing, residual value) and with the options of electrification.
- Include benefits from warranties, modern features, and fuel/energy efficiency.

Decision Support:

- Replacement is viable when new assets offer lower lifecycle costs and operational risk.
- Useful when LCC analysis shows a net present value (NPV) gain or return on investment (ROI) improvement.

3. Repurposing Decisions

Scenario: A decommissioned building is considered for conversion into a data centre.

Lifecycle Cost Insight:

- Analyse conversion costs versus benefits of reusing existing infrastructure.
- Factor in potential operational efficiencies, regulatory compliance costs, and building longevity.

Decision Support:

- Repurposing is viable when the repurposed asset has a lower LCC than new construction and supports strategic objectives.
- May also yield sustainability and branding benefits.

Benefits of Lifecycle Cost-Based Decisions

Following list provides some of the benefits for the LCCs;

- Data-Driven Justification: LCC helps build solid business cases for capital approval.
- Optimized Resource Allocation: Focuses investment where long-term value is highest.
- Risk Management: Identifies cost and performance risks early in decision cycles.
- Sustainability and Compliance: Aligns asset decisions with ESG and regulatory frameworks.
- Improved Planning: Facilitates long-term budgeting and scenario planning.

Tools and Techniques

- Net Present Value (NPV): Adjusts future costs/ benefits to today's dollars.
- Return on Investment (ROI): Measures financial return from investment.
- Monte Carlo Simulations: Assesses risk and uncertainty in cost estimates.
- Digital Twins and Asset Performance Management (APM): Offer real-time insights into asset condition and expected costs.

Best Practices

Below is the summary of the best practices that can assist to implement the LCC approach;

- Standardize LCC Models: Use consistent assumptions and templates across asset classes. Start with simple but consistent MS excel sheets.
- Include Intangible Costs: Downtime, safety incidents, and brand impact.
- Involve Cross-functional Teams: Finance, procurement, operations, engineering, and sustainability.
- Integrate with Asset Management Plans: Align with ISO 55000 or enterprise asset management systems.
- Review Regularly: Update LCC models based on real-world performance data.

Conclusion

Making the right decision during the asset lifecycle on repairing, retrofitting, replacing, or repurposing an asset can significantly influence an organization's performance and competitiveness. Lifecycle cost analysis offers a powerful framework for navigating these choices, ensuring decisions are not just reactive or based on initial costs, but on total long-term value. By embedding lifecycle thinking into asset management practices, organizations can make smarter, more strategic, and more sustainable decisions.

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The Asset Management

CAREER PLANNING TOOL

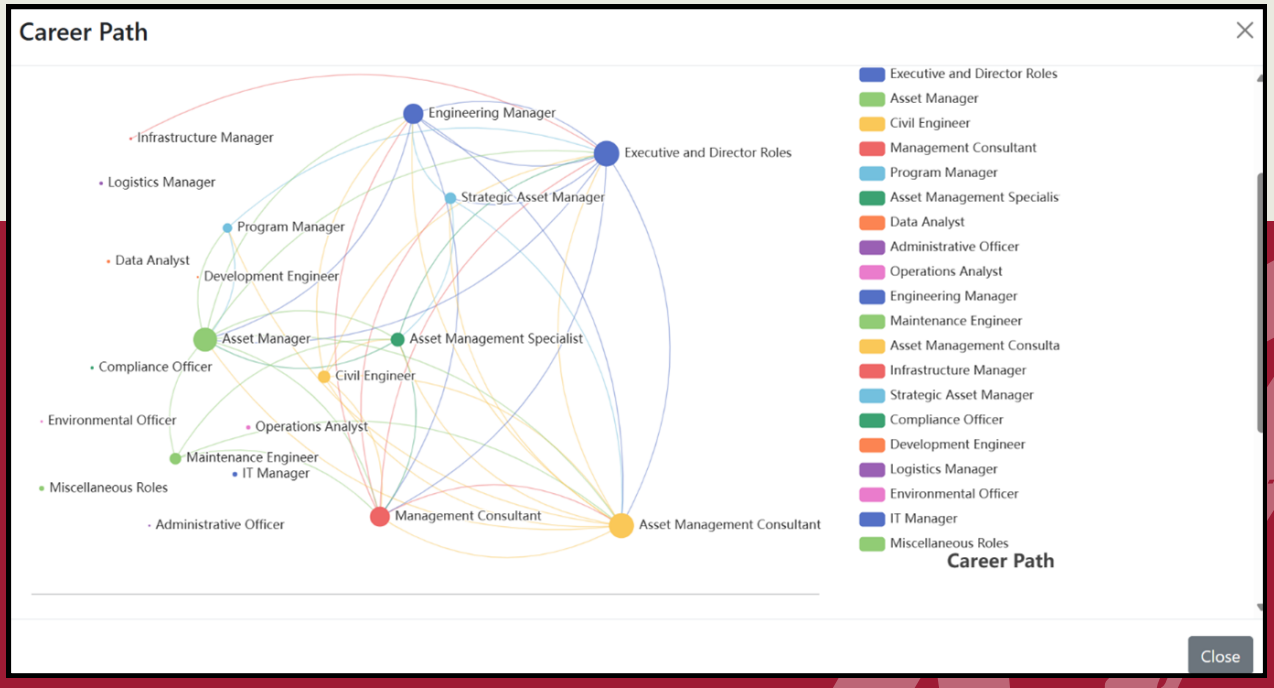
- **Wondering what asset management competencies you still need in your asset management journey?**
- **Looking for a Personalised Asset Management Career Mapping Tool?**
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Use the online tool to Create your Asset Management Individualised profile. Use your self assessment to map your future career and work on any gaps in asset management competencies.

Available to everyone from the AM Council website. Just login to the AM Council website and navigate to certification pages and AM GFMAM landscape or use this shortcut link to get started: www.amcouncil.com.au/career

There is no particular defined career path in Asset Management, but more a personal journey in collecting Asset Management competencies together with other competencies in your particular chosen field that allows one to get to the position to which you aspire.

Use the career path tool to compare your asset management competencies against those most common for various job roles and plan your future today!



STAR PROFILE – Vijendran Candasamy CPAM



Why Asset Management?

I work in an alumina refinery where asset performance is critical to safety, efficiency, and sustainability. Asset management provides the structure to make informed decisions across the asset lifecycle - balancing cost, risk and performance. It enables us to maintain reliability, optimise operations and plan strategically for the future. For me, asset management is about creating long-term value and ensuring our assets support both production goals and environmental responsibility. Becoming a CPAM has strengthened my ability to contribute to smarter, more sustainable outcomes in a high-demand industrial environment.

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

I've been working in the asset management sector since 2010, across a range of heavy industries including steel manufacturing, coal mining, port operations, rail and now alumina refining. This diverse experience has given me a broad perspective on asset performance, lifecycle planning and risk management. Each sector has deepened my understanding of how strategic asset management can drive safety, reliability and long-term value in complex operational environments.

What is your speciality?

My speciality is in reliability engineering and using data to drive asset management decisions. I focus on improving asset performance and lifecycle outcomes through condition monitoring, failure analysis and predictive maintenance strategies. With experience across steel, mining, ports, rail and alumina refining, I apply a data-informed approach to optimise reliability, reduce risk and align asset strategies with business goals. I'm passionate about turning complex data into actionable insights that support safe, efficient and sustainable operations.

What drew you to explore more about this?

I've always been driven by a desire to solve problems at their root and reliability engineering offered the perfect blend of technical depth and strategic impact. Early in my career, I saw how unplanned failures could disrupt operations and safety. That sparked my interest in using data, failure trends, condition monitoring and performance metrics - to make smarter and proactive decisions. The ability to turn data into insights that improve reliability, reduce downtime and support long-term asset health is what continues to motivate me in this field.

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

The best career advice I've received came from a mentor early in my career who told me, **"Don't just fix problems, understand why they happen."** That advice shifted my mindset from reactive to proactive thinking and sparked my interest in reliability and data-driven decision-making. It taught me to look beyond the immediate issue and focus on long-term solutions that add value. That perspective has shaped how I approach asset management and continues to guide my work today.

What makes a great asset manager?

A great asset manager combines technical expertise with strategic thinking. They understand the full asset lifecycle and make decisions that balance cost, risk and performance. But beyond the technical side, what truly sets them apart is their ability to communicate across disciplines, use data effectively and stay focused on long-term value. They're proactive, curious and always looking for ways to improve reliability, safety and sustainability. In complex industrial environments, a great asset manager doesn't just manage assets, they enable better business outcomes.

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

One of the most exciting trends in asset management today is the growing use of advanced data analytics, machine learning and AI to predict asset performance and optimise maintenance. The shift from reactive to predictive strategies is transforming how we manage risk, reduce downtime and extend asset life. In heavy industries like alumina refining, this means smarter decisions, better resource allocation and improved safety. It's exciting to see how data is becoming a strategic asset in itself, enabling more proactive and value-driven asset management.

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

One of the biggest challenges is navigating the growing complexity of data and technology while still maintaining a clear focus on value. New asset managers are expected to understand advanced analytics, digital tools and evolving standards—often while managing legacy systems and tight budgets. Balancing technical skills with strategic thinking, stakeholder engagement and long-term planning can be daunting. The key is staying curious, continuously learning and not losing sight of the core purpose: making informed decisions that deliver sustainable asset performance.

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

Stay curious and never stop learning. Asset management is evolving rapidly and success comes from being adaptable - whether it's embracing new technologies, understanding data, or navigating complex stakeholder environments. Focus on the fundamentals: know your assets, understand the risks and always ask how your decisions could create value. Don't be afraid to ask questions or challenge. And most importantly, build strong relationships - collaboration is key to delivering sustainable and long-term outcomes.

What is the biggest challenge facing the asset management sector today?

One of the biggest challenges is managing the transition from traditional, reactive practices to more integrated, data-driven asset management - especially in industries with legacy systems and infrastructure. There's growing pressure to improve reliability, reduce emissions and extend asset life, all while navigating tighter budgets and workforce changes. Bridging the gap between operational knowledge and digital innovation is critical. The sector needs to invest in capability development, data quality and cross-functional collaboration to ensure asset management continues to deliver value in an increasingly complex environment.

What is your proudest career achievement?

One of my proudest achievements was at the alumina refinery where I currently work, where I transformed our defect elimination register from a subjective, opinion-based list into a data-driven, prioritised tool using Pareto analysis. This change helped shift the focus toward the most impactful issues, leading to noticeable improvements in reliability and asset performance. It also encouraged a more analytical and proactive culture within the team. Seeing how a structured, data-informed approach could drive real operational outcomes was incredibly rewarding.

What's next for you?

I'm focused on continuing to grow as a strategic asset management leader, deepening my expertise in reliability, data analytics and sustainable asset practices. I'm particularly interested in exploring how digital tools and predictive technologies can further enhance decision-making in complex industrial environments like alumina refining. I also hope to mentor emerging professionals in the field, sharing what I've learned and helping build capability across the industry. For me, it's about continuous improvement in the way we manage our assets!

When you're not busy at work, what do you enjoying doing?

Outside of work, I love spending time with my wonderful wife and our two kids. Most of my free time is dedicated to family adventures, whether it's exploring outdoors, playing games, or just enjoying a quiet weekend together. They keep me grounded and remind me of what really matters. It's a great balance to the demands of work and helps me recharge and stay present—both at home and on the job.

STAR PROFILE – Anton Glover CPAM



Why asset management?

Asset Management has been the most engaging and eye-opening experiences of my career. Asset management opens up such a wide scope of opportunities, there is so much to do, so much to be involved with, so many skills that can be bought to the table and there is so much potential to create positive change world.

I believe in looking after the things that you have. I believe in understanding the value of what you have. I believe in tracking the history of what we have. I believe in having as many facts as you can get to make the best decision at the time.

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

Moving into a dedicated asset management role is a more recent development to my career, one that I am extremely grateful for. Originally, it was only meant to be a temporary sidestep. Asset Management hadn't even been flagged as a career option for someone with my Mechatronics Engineering background in systems integration and data.

I look back at my career and I am so glad I took that sidestep. Moving in that direction really bought together a lot of my experiences from the Water industry. Developing inspections plans & schedules, database management, process analysis & monitoring, governance and business management, etc, It provided purposes, context and meaning to the skills I had acquired individually accross various workplaces and projects.

What is your speciality and what drew you to it?

I would say my speciality would be to take a systems integrators approach to the data management of complex assets within the Water Industry. It's a mouth full to say, and maybe a bit bombastic too, but I haven't thought of a simpler way to put it yet.

I don't think there was any particular point that drew me to explore that as a speciality, that's just where my career has taken me. I do feel fortunate though that my career path landed my into a fun little niche.

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

I was having coffee with a friend a few years ago who had launched their own IIoT business. As we were talking about careers and journeys etc, he said something to me along the lines of, "Know what your value is to the company you work for, compare that to your value in the marketplace, and then understand where you stand within the company and compare that to the marketplace. That way you can make career decisions based on the facts you need to have and where you are at." It was a piece of advice that has helped grow my career, salary and (indirectly) put the world in some much-needed perspective.

What makes a great asset manager?

Someone who is not only a good communicator, but a great networker. Being able to network between teams and groups, regardless of where a project is in its delivery, or an asset is within its lifecycle, or who current is in possession of the asset etc, is a sure-fire way to seamlessly produce tangible outcomes.

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

The most exciting trend I've observed in the water sector from my systems integration background is that asset management is quite undersold and has huge potential for growth the tech space, the amount of low hanging fruit is an innovators dream. It's an opportunity to start some profile building and create outstanding business cases for remote monitoring and the sharing of data & reporting. Making minor changes to create momentum and innovate, that's the exciting part.

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

It might sound a bit bleak, but I feel there is a bit of a pay celling for engineers who want to enter into the Asset Management field working for LWU's. Those engineers who would enjoy it and that are also really ambitious, might just become frustrated at the pay celling. I have encountered this challenge in my career, but I have tried to navigate around that by supplementing my asset management experience into other engineering roles that really lack understanding and skillset in that space. It's provided me with some freedoms to continue to purse asset management related changes for my employer and the wider organisation.

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

To be a good Asset Manager, you need to be like a spider at the centre of its web. The web is the entangled complicated network of business functions, where each strand of silk connecting line to a different part of the business (Finance, Operations, Projects, Services, Community Engagement etc). Your job as the spider is to pay attention for a vibration down any one of those lines of silk. When you feel a movement, go down and investigate. If there is a tasty treat, then you have come away with something actionable, but if it was a false alarm, use it to show your presence, network and socialise with the others in the environment. If the web is damaged, help to repair it, be involved in the process before returning to the centre.

What is the biggest challenge facing the asset management sector today?

With the delivery of essential services, there are key stakeholders being torn from one job to another, or consistently putting out fires, or getting caught up in the fast pass nature of the business. It leaves them with little to no time or capacity to address effective asset management requirements. In the thick of it, the "care factor" might seem to be non-existent. So trying to get support or push for best practices during those times, is difficult. That would be a contributing factor to staff retention and attracting skills to the regional areas of our country when there might be a reputation or perception of not taking asset management seriously.

What is your proudest career achievement?

That would have to be as part of my volunteer career as a firefighter. It was a very emotional and proud moment being awarded a National Emergency Medal for my involvement in the 2019-20 bush fires. It was a piece of recognition I never thought to receive, a lot of us didn't think we would have received it. I still look back and remember driving up through the blue mountains and the mid-north coast and seeing all the signs that people put out to the side of the road thanking us Fireys for our help. The random people in the street, who you could tell were shook from the events, that would come up to us and say thank you. There was a lot of people in crisis, tired, and in fear during those fires. I look back at that whole summer, and I was proud of being able to lend a hand to people who needed it. Being able to volunteer and give back is something I would recommend to anyone, just as a part of living a good life, join a service or club where you help others and the community. Take pride in being a volunteer, because Australia really does run off the back of its volunteers!

What's next for you?

Well I'll be moving into a new role by the time this comes out, I'll be the Water & Sewer Reticulation Network Engineering for our Local Water Utility. I'm looking forward to taking my asset management and systems engineering experience into the operational role. There is a lot of desire for innovation in that space and a lot of low hanging fruit to grab creating some momentum. I'm keen to create positive change!

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

My current project has some family significance to it, I'm restoring a 1974 Suzuki A100. After some research I discovered it was an American import. The interesting aspect there is needing to track down a lot of unique parts specific to the American release of the motorcycle to make sure the restoration is as it should be. I'm looking forward to being able to take it out for a run down to the beach on a Sunday morning, grab a coffee at one of the cafes and then watching the sunrise. It's the simple things in life that are becoming more enjoyable.

STAR PROFILE – Johan Snyman CSAM



Why Asset Management?

Because it is where everything I have learned, technical, strategic, operational, comes together to create real, measurable value.

I started my career on the tools, as a Radar Technician, then an Electrician, and later as an Automation Specialist. I loved solving problems, getting systems back online, and making things work better. But even early on, I realised that technical fixes alone were not enough. You could be the best tradesperson in the room, but if the work were not aligned with the bigger picture, if it were not the right work, on the right asset, at the right time, it did not move the needle.

That is what drew me to asset management. It sits at the intersection of strategy, engineering, finance, and operations. It is not just about maintaining assets, it is about making decisions that optimise their whole, of, life performance. It gave me a framework to connect reliability with return on investment, and maintenance with long, term sustainability.

I have worked across defence, facilities, ports, utilities, and mining, and the same principle always holds true: assets exist to deliver value. Our job is to make that value visible, measurable, and achievable.

I will admit, I stumbled into formal asset management. I was a solid Maintenance and Shutdown Manager, but in 2010, a serious incident at a refinery involving a hydrogen vessel changed everything. I was tasked with restoring the plant's integrity. That led me to UWA, where I met Professor Melinda Hodkiewicz. That conversation was a turning point. I began to pursue asset management deliberately, through qualifications, system design, major implementations, and eventually developing the AM8760 simulation model to teach and apply it.

Meeting Dave Daines at BHP further accelerated that journey. Since then, I have seen asset management turn around underperforming businesses, justify major capital decisions, and shift mindsets from reactive cost centres to proactive value creators.

The AM8760 framework became a cornerstone of my work. It is about aligning asset decisions with the full operational calendar, 8,760 hours a year, and ensuring every action contributes to business outcomes.

So why asset management? Because it is where I have built my career, created impact, and found purpose.

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

I have been in asset management for over 30 years, but the way I have practiced it has evolved significantly.

I started my development in a technical school (HTS Sasolburg) in what would today be vocational training with my career path as an electrician and

then worked in a career on the tools, as a Radar Technician, then an Installation Electrician, and later as an Automation Specialist. In those early years, I was managing assets in the most hands-on way possible: maintaining, repairing, and optimising systems in real time. I worked in steel mills, defence, mining, oil and gas, and utilities, environments where failure had real consequences, and where I developed a deep understanding of structure, discipline, and reliability.

That was the foundation. But 15 years ago, my focus shifted from managing assets to managing asset management.

My global journey shaped that transition:

- In South Africa, I built my technical base, working directly with maintenance systems, reliability practices, and asset performance improvements.
- In Mozambique, I moved into infrastructure and project delivery, navigating complex environments and learning to lead across cultures and constraints.
- In Australia, I refined and scaled my asset management expertise. I have worked across ports, facilities, FMCG, robotics, heavy industry, and mining, delivering everything from ISO 55001 implementations to shutdown strategies and digital asset management systems.

Over time, my roles evolved from operational to strategic. I began designing system frameworks, collaborating with executives, and preparing the next generation of asset leaders. I developed the AM8760 simulation model to help organisations understand the full, year impact of asset decisions, and I have led award, winning transformations that turned reactive maintenance cultures into proactive, value, driven systems.

A pivotal moment came in 2010, after a major incident at a refinery involving a hydrogen vessel. I was tasked with restoring the plant's integrity. That led me to UWA, where I met Professor Melinda Hodkiewicz, a turning point that launched my formal journey into asset management. Later, working with Dave Daines at BHP, I saw how structured asset management could transform entire businesses.

So, while I have always been close to assets, the last 15 years have been about building the systems, strategies, and cultures that make asset management a driver of business value, not just a cost centre.

Wherever I have worked, whether in an engine room, a boardroom, or a shutdown bunker, the goal has remained the same: build systems that work, empower people to use them, and make asset value visible, measurable, and achievable.

What drew me to this specialty was the consistent gap I saw between operational effort and strategic value. Early in my career, I saw highly skilled people working hard, but without a clear line of sight to business outcomes. Work orders were closed, but asset risk was not reduced. Budgets were spent, but value was not measured.

That disconnect made me ask better questions, *Why are we doing this? What is the actual value? How do we know it is working?* and asset management gave me the language and structure to answer them.

As I moved into more senior roles, I saw the power of a structured asset management system to change behaviours, drive better decisions, and justify investment. ISO 55001 gave clarity. GFMAM and AMC frameworks gave structure. But more importantly, implementation gave results, improved uptime, optimised spend, and making sure the work lines up with business goals.

That is why I kept digging deeper. I did not want surface, level compliance; I wanted systems that work, that last, and that people believe in. That is how AM8760 was born, because people needed to experience that alignment, not just read about it.

It is the combination of technical, strategic, and human elements that keeps me in this space. Asset management is where all those elements come together to create real,

lasting value.

STAR PROFILE – Johan Snyman CSAM

The best career advice I ever received did not come in the form of encouragement, it came as a challenge. Someone once told me, "You can't do that." I heard it back in school, when I was a bit wild and always insisted on doing things my way. But instead of discouraging me, those words lit a fire. They pushed me to question the status quo, explore alternative methods, and never settle for "that's how it's always been done."

That mindset taught me a powerful lesson: activity is different from impact. Just being busy does not mean you are delivering outcomes that matter. I learned to pause and ask everybody around me the most important question: *"What do you think?"* a question that invites insight, challenges assumptions, and empowers others.

Another question that is guided me throughout my career is: *"Is this helping the asset, the operation, or the business?"* If the answer is no, it is time to rethink.

That simple but profound advice has shaped everything I do, from planning shutdowns to designing asset management systems. It is influenced how I lead teams, engage with executives, and build systems that do not just tick boxes they solve real problems.

It started as a challenge. It became a mindset. And it has never failed me.

A great asset manager connects **technical insight** with **strategic thinking** and drives **decisions that create value.**

To me, a great asset manager has:

- **Clarity of purpose –** They understand that assets exist to enable organisational objectives, not the other way around.
- **Decision discipline –** They know how to balance cost, risk, and performance across the asset lifecycle using data, context, and risk, informed judgment.
- **System thinking –** They see the whole value chain, from planning and design through to operations, maintenance, and renewal, aligning people, processes, and systems.
- **Credibility on the ground and in the boardroom –** They can engage tradespeople and executives with equal confidence, translating strategy into language that resonates at every level.
- **A bias for action –** They do not wait for the perfect system; they make incremental improvements that deliver real impact.
- **Resilience and curiosity –** They ask questions, challenge assumptions, and keep learning.

In short, a great asset manager builds trust, makes value visible, and leaves behind a system that works without them.

The most exciting trend in asset management today is the **shift to ensure the** w*ork we do actually supports the business and delivers results that matter* driven by data, systems integration, and a stronger focus on decision, making.

Organisations are moving beyond just having an asset register and maintenance plan. They are asking:

- *Are we spending in the right places?*
- *What risk are we carrying?*
- *How do we demonstrate the value of our decisions to stakeholders?*

This shift is being accelerated by digital tools, like predictive analytics, real, time condition monitoring, and digital twins, but the real power lies in how those tools are used to inform smarter, faster, and more transparent decisions. What excites me most is the maturity of the conversation. Boards are now asking for asset risk profiles, long, term investment scenarios, and evidence of asset stewardship. And frontline teams are starting to see how their work

connects to business outcomes. That alignment between boardroom, engineering, operations, and finance, is where the future of asset management is heading. It is not just about managing assets better. It is about using assets to manage the business better.

The biggest challenge facing up-and-coming asset managers today is navigating complexity without getting lost in it.

Modern asset management demands more than technical know, how. You need to understand finance, risk, regulation, digital systems, and organisational culture, all while being held accountable for long, term outcomes with short, term constraints.

Many new asset managers come in well, trained technically but struggle to:

- Connect their work to strategic goals.
- Influence decisions across functions.
- Speak the language of executives and CFOs.
- Prioritise in environments flooded with data but short on insight.

There's also pressure to adopt every new tool, AI, digital twins, advanced analytics, without a clear purpose or maturity framework behind it.

The key challenge is learning to **think in systems, focus on value,** and **communicate clearly across the business.** Without that, it is easy to end up buried in compliance tasks, reactive noise, or technology distractions, delivering activity, not impact.

Asset management is not just a technical role, it is a leadership role. And stepping into that space with confidence, clarity, and credibility is what sets great asset managers apart.

My advice to an up and coming asset manager is simple: focus on value, not just activity, and learn to connect your technical knowledge to business decisions.

Here is what I would tell them:

- Learn the business – Understand how your organisation makes money, what your customers value, and how your assets enable that. If you do not know the commercial context, you cannot make strategic decisions.
- Get fluent in the language of risk, cost, and performance – Asset management is about trade, offs. Be the person who can explain those trade, offs clearly to decision, makers.
- Do not chase tools, build systems – Digital tech is powerful, but without process and purpose, it is just noise. Get your fundamentals right before layering on complexity.
- Work across silos – Great asset managers build trust between operations, maintenance, engineering, finance, and executives. Learn to listen, influence, and bring people together.
- Stay curious but stay grounded – Frameworks like ISO 55001 and the GFMAM Landscape combined with the AMC models, exist for a reason. Use them to guide your thinking, but never forget the practical reality of the site, the crew, and the customer.

Most importantly: own your role as a decision, maker. You are not just managing assets; you are helping the organisation decide how to get the best from them. That mindset changes everything.

The biggest challenge facing the asset management sector today is bridging the gap between strategic intent and operational execution, especially in complex, asset, intensive environments.

Many organisations have frameworks, plans, and systems that look good on paper, but they struggle to embed those consistently across frontline operations. The result is misalignment: strategy says one thing, but daily decisions say another.

STAR PROFILE – Johan Snyman CSAM

Specifically in my field, designing and implementing ISO 55001, compliant systems, the challenge is getting beyond documentation and delivering cultural adoption. It is not enough to have a SAMP or an AMP. The hard part is getting planners, maintainers, engineers, and executives to think and act in ways that reflect those documents.

Other key challenges include:

- Data quality and integration – Organisations are collecting more data than ever but still struggle to trust or use it effectively.
- Workforce capability – There is a growing skills gap, particularly around strategic thinking, risk, based decision, making, and systems leadership.
- Siloed thinking – Finance, operations, and engineering often operate in isolation, making it hard to manage lifecycle value.
- Short, term pressure – Asset managers are expected to deliver long, term value in environments that reward short, term results.

The sector does not need more reports. It needs strong implementation, decision discipline, and a culture of asset accountability that runs from the boardroom to the workshop. That is the challenge, and the real opportunity.

My proudest career achievement is leading the development and implementation of an **ISO 55001, certified Asset Management System at Southern Ports,** transforming how the organisation managed critical port infrastructure across three geographically dispersed sites.

This was not just a compliance exercise; it was a full system uplift. We built a clear line of sight from board, level objectives down to work execution. We integrated strategic planning, risk, based maintenance, lifecycle costing, and performance monitoring into one cohesive framework. And most importantly, we did it with the people on the ground, through engagement, training, and cultural alignment.

That system went on to win national recognition, but what makes me proud is the legacy it left:

- Better decisions based on risk and value.
- Clearer roles, accountabilities, and priorities
- A stronger safety and performance culture
- And a structure that continues to deliver value well beyond the certification

I have delivered many successful programs, shutdown strategies, and digital initiatives, but that system proved what asset management can achieve when it is properly embedded, owned by the business, and focused on outcomes. That is what I stand for, and that is still the benchmark I hold my work against.

What is next for me is **helping the next generation of asset managers and organisations build systems that deliver value, at scale, and with purpose.**

I am focused on three priorities:

1. Expanding AM8760 – The simulation I developed is evolving into a full learning platform to teach asset management principles in a hands-on, scenario, driven way. It is already used to train professionals across industries, and I am scaling it to support boards, graduates, and frontline leaders alike.
2. Advising on high, impact implementations – I am continuing to work with organisations, particularly ports, utilities, and mining, to design and embed ISO 55001, aligned systems that actually work in practice, not just on paper.
3. Publishing and mentoring – I am documenting the lessons from 30+ years in the field through publications, case studies, and mentoring. The goal is to share proven approaches, challenge outdated thinking, and support practical leadership in asset management.

For me, it is not about chasing the next role, it is about driving maturity in the sector, lifting capability across the industry, and making sure asset management remains grounded in value, not jargon.

You have recently authored a book on Asset Management System implementation.

Yes, I have authored a book that explores how to implement an asset management system using structured methodologies and a delivery model and using AI to align the methodology.

The idea was born from years of hands, on experience in asset, intensive industries, where I saw firsthand how traditional approaches often fall short in delivering sustainable value. I wanted to create something practical, actionable, and scalable; something that could help teams move beyond compliance and into performance.

AI played a pivotal role in shaping the book. It helped me structure the content, validate methodologies, and even simulate implementation scenarios.

At the heart of the book is the **AM8760 framework**, which I developed to align asset management activities with the full operational calendar, 8,760 hours a year. It is a way to ensure that every decision, every intervention, and every system is designed to support continuous value delivery. The framework integrates:

- **Strategic alignment** with business objectives
- **Operational planning** that reflects real, world constraints
- **System design** that supports both compliance and performance
- **Team engagement** through clear roles, responsibilities, and feedback loops

The **Southern Ports Implementation** were instrumental in grounding the book in reality. They provided case studies, data, and insights into how structured asset management can transform port operations, from maintenance planning to executive engagement. These papers demonstrated how a well, implemented system can reduce downtime, improve safety, and unlock hidden value in existing assets.

One of the key messages in the book is that **activity is different from impact.** Just being busy does not mean you are delivering outcomes that matter. That is why I emphasize the importance of asking powerful questions like "*What do you think?"* and *"Is this helping the asset, the operation, or the business?"* These questions drive clarity, accountability, and innovation.

Ultimately, the book is more than a guide, it is a mindset. It is about challenging the status quo, embracing structured thinking, and using technology (like AI) to build systems that solve real problems. I am looking forward to seeing how these ideas resonate with professionals across industries.

When I am not deep in asset systems or strategy workshops, I keep things simple. I enjoy b**eing outdoors,** whether that is walking along the coast, working on DIY (LEGO) projects, or spending time on the kayak fishing, anything that gives me space to think without screens or noise.

Zandra and I are currently preparing ourselves for the BIG LAP, yes, we are going to do it, and based on my career history, this is becoming an asset management system implementation.

I also enjoy writing, especially reflecting on projects, lessons, and the people I have worked with over the years. It helps me process experience and share knowledge in a meaningful way, whether through articles, case studies, or just a relevant story.

And when I really want to switch off, I spend time with my two grandchildren, enjoy a good meal, and stay curious, our profession is an evolution and we need to stay informed and see the future, whether it's through reading or whitepaper research that challenge my thinking. Balance helps me come back sharper, more grounded, and ready to tackle the next challenge.

My career has taken quite a few turns, across continents, industries, and disciplines, but always centred around one thing: making assets perform better, for longer, and with greater value. And always supported by Zandra and my two daughters as they

STAR PROFILE – Johan Snyman CSAM

travelled the globe to support me always be where I am working.

What did you learn from working in Defence and Mining, and how does that help you in Asset Management?

Working in Defence and Mining shaped how I approach asset management today, through deep exposure to risk, precision, pressure, and performance accountability.

From Defence – *Overberg Test Range (OTR):* At Overberg Test Range in South Africa, I supported operations within one of the most technically demanding and security, critical environments in the Defence sector. OTR managed high, value, high, risk assets including radar systems, telemetry installations, and missile testing infrastructure, where failure was not just costly, it was unacceptable.

Here is what I learned:

- System integrity and readiness are non, negotiable, Defence assets at OTR had to function under strict conditions, with zero tolerance for downtime during tests. This sharpened my understanding of asset criticality, configuration control, and contingency planning.
- Documentation and traceability matter, Every asset action at OTR had to be traceable and justifiable. That experience drove home the importance of audit, ready systems, lifecycle documentation, and alignment to international standards.
- Interdisciplinary coordination is essential, Collaborating with engineers, scientists, operations teams, and national defence bodies taught me how to build systems that work across technical, regulatory, and operational boundaries.

From Mining: Mining taught me how to apply that same level of rigour in harsh, high, pressure, production, driven environments. I have worked across large, scale mines, processing plants, and infrastructure services, where:

- Production never stops; I had to develop maintenance strategies that delivered reliability without holding up throughput.
- People matter as much as systems, Success in mining comes from frontline buy, in, especially in remote sites. I learned how to create asset processes that are practical, visual, and owned by the workforce.
- Data needs purpose, From asset registers to condition monitoring, I saw firsthand that data is only useful when it drives better decisions.

How it Helps in Asset Management:

Together, Defence and Mining gave me a dual perspective:

- Defence taught me how to engineer for risk and certainty.
- Mining taught me how to manage assets under constraint and complexity.

This background now helps me:

- Build structured, standards, aligned asset systems with clear roles, traceability, and assurance.
- Deliver risk, based maintenance and planning frameworks that work under production pressure.
- Design decision, making models and training tools (like AM8760) that link asset performance to business value.
- Operate confidently across strategy, systems, and frontline operations.

Whether it is a radar array or an ore handling plant, the principles remain the same: align purpose, manage risk, make value visible. That is what I have taken from those sectors, and it is shaped everything I do in asset management.

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Exploring how strategic asset management drives performance, resilience and value

Join AMPEAK26, a world-leading asset management conference featuring exhibits, case studies, and technical insights from across industries. It's the ultimate meeting place for asset managers to explore emerging trends, share knowledge, and find practical solutions to use in the workplace.

Come and hear from asset management experts covering lifecycle issues for all assets, take part in interactive sessions, chat to exhibitors and networks with professionals across all sectors and industries.

The theme for **AMPEAK26** is **Powering Productivity and Prosperity,** and there are five key topics that will be of interest to academia, directors, CEO's, executive managers across asset rich organisations, asset management and maintenance practitioners, including:

Workforce Transformation and Knowledge Retention:

Empowering people to drive performance - leadership and capability for the future

This theme explores how asset-intensive organisations are addressing critical workforce challenges — from skills shortages and an ageing workforce to knowledge loss and evolving expectations of new generations.

- Leadership and change management in asset management
- Capability frameworks, competency standards, and continuous upskilling
- Mentoring, knowledge transfer, and strategies to prevent knowledge loss
- Workforce diversity, inclusion, and wellbeing (including mental health)
- Inspiring the next generation of asset management professionals – career pathways and competency development

Data-Driven Decision Making and Digital Innovation:

Harnessing technology, information, and analytics for smarter decisions

This theme shows how data and digital tools are being leveraged to drive better maintenance decisions, optimise asset performance, and reduce costs.

- Data governance, integration, and assurance of data quality
- Predictive analytics, AI, machine learning, IoT, and condition monitoring
- Digital twins, BIM, and smart/connected assets
- Cybersecurity and protecting digital asset information
- Digital engineering and advanced information management systems
- Closing the digital ROI gap: from investment to realised business value

Strategic Alignment and Value-Focused Asset Management:

Embedding asset management into enterprise strategy and governance

This theme focuses on how organisations are aligning asset strategies with enterprise and societal goals to drive productivity, resilience, and stakeholder value.

- Asset management planning and risk-based decision-making
- Governance, compliance, and integration with ISO 55001:2024
- Communicating asset management value to executives and boards
- Investment prioritisation and lifecycle costing
- Policy, standards, and regulation for improved productivity
- Measuring and demonstrating asset management's contribution to organisational, national and societal outcomes

Operational Excellence, Reliability and Safety:

Driving performance, assurance, and resilience in operations

This theme seeks insights into how organisations are improving their planning, scheduling, reliability engineering, and execution disciplines to maximise asset availability and safety

- Reliability-centred maintenance and asset strategies, assurance frameworks, and performance metrics
- Improving planning, scheduling, work management processes and tools-in-hand/field time workforce productivity
- Resilient operations for aging and critical infrastructure
- Failure analysis and condition monitoring
- Integrating safety and risk management into reliability and maintenance

Sustainable Asset Management and Societal Value:

Embedding sustainability and resilience in asset decision-making

Delivering resilience, decarbonisation, and long-term prosperity

This theme focuses on how asset management supports decarbonisation, climate adaptation, circular economy practices, and broader social outcomes.

- Decarbonisation strategies and managing the energy transition
- Circular economy and asset reuse, refurbishment, and sustainable procurement
- Embedding climate risk and resilience in asset strategies
- Financing models and mechanisms for sustainable infrastructure
- Nature-based solutions and innovative practices for resilience
- Measuring and reporting ESG and societal outcomes of asset management

PERTH LOCATION

This year's conference is being held at Crown Perth, with various social events such as our welcome reception, and you won't want to miss our Gala Awards night. The prestigious dinner and 2026 awards ceremony will be held on the Tuesday evening.

NOMINATE YOUR ORGANISATION FOR AN AWARD

Nominations for asset management excellence are available in a range of categories. Awards will be presented at the gala dinner.

HOSTED BY: ASSET MANAGEMENT COUNCIL

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www.ampeak.com.au

CHAPTER **NEWS**

BRISBANE

Asset management practitioners from across Brisbane – along with our Mackay and Townsville hubs dialling in to contribute – came together in October for an engaging, hands-on workshop on Asset Management Planning: Good Practices and Tools. The session focused on how effective planning underpins good asset management across the full life cycle – from identification and acquisition through to operation, maintenance and eventual disposal.

Working in rotating breakout tables, participants explored different planning aspects and life cycle phases, using the GFMAM Asset Management Landscape and ISO 55001 as common reference points. Each table was tasked with unpacking "good practice" – not just what it looks like on paper, but the practical how to that makes it work in real organisations. Along the way, attendees and hub participants shared examples from their own contexts, discussed pitfalls and enablers, and compared the tools and techniques they use to support planning.





The workshop was highly interactive, with groups leaning over templates, whiteboards and worksheets to test ideas and build on the insights of previous rotations. The final plenary brought these threads together into a consolidated view of what robust asset management planning can and should look like.

A key outcome of the session was the development of a shared resource, the Good Practice Evaluation Artefact: Asset Management Planning, capturing the workshop's collective insights, examples and recommendations. This artefact will support practitioners in assessing and strengthening their own planning approaches, and stands as a tangible output from a very productive and collaborative Brisbane Chapter event.

MELBOURNE

The AMCouncil Melbourne Chapter gathered in October for an insightful session exploring how to elevate data to the status of a true strategic asset.

Guest presenter Michael Mowat shared his approach to treating data as a core enabler of defensible investment planning—moving beyond data clean-up to demonstrate the tangible link between data quality, decision confidence, and asset performance.

Michael guided attendees through practical steps for establishing robust data governance, defining data requirements aligned to decision-making, and using high-confidence information to build transparent and trusted business cases. The session was a timely reminder that in asset management, information is not just an input—it's an investment in itself.





NEW ZEALAND

Professionals from across New Zealand came together in Christchurch in October for an insightful evening on Inland and Coastal Water Assets – Supporting Economic Development. The event explored how well-managed water assets underpin local and regional growth, connecting practical asset management with broader economic and community outcomes.

CHAPTER **NEWS**

Attendees heard first from Kees Bentjes (Engineering Manager) and Tony McCormack (Chief Executive) on the Rangitata Diversion Race, showcasing how a deliberate asset management strategy supports long-term reliability, water security and regional productivity. This was followed by William Campbell (Engineer – Ports and Coastal Marine, WSP) and Tristan Williams (Head of Maintenance and Security), who shared real-world insights into marine asset management at Lyttelton Port Company. Their session highlighted the importance of resilient coastal and port infrastructure in enabling trade, supporting jobs and managing exposure to environmental and climate-related risks.

The session sparked thoughtful discussion on how inland and coastal water assets can be managed to support sustainable economic development, now and into the future.

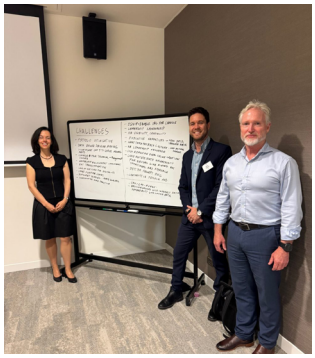
PERTH

The Perth Chapter was pleased to welcome corporate member representatives to a special technical breakfast in November, bringing together leaders from across the asset management community to reflect on 2025 and look ahead to the opportunities and challenges of 2026. Over a light breakfast, attendees heard updates on the Asset Management Council's achievements, explored emerging strategic themes, and engaged in thoughtful discussion on asset management in some of the most complex environments in the world.

Perth Chapter Chair Adam Rotapel opened the session with a warm welcome and an overview of the Chapter's activities and achievements throughout 2025. Adam highlighted the strength of the local corporate member community, the growth in engagement across technical events, and the ongoing focus on building asset management capability and collaboration across sectors in Western Australia.

This was followed by an insightful national and international update from Asset Management Council Board Director Dr Yvonne Power, who outlined the Council's major achievements in 2025 and the strategic themes and objectives guiding the work program for 2026. Dr Power spoke about the AMCouncil's role in lifting asset management maturity, strengthening partnerships, and supporting practitioners to respond to productivity, resilience and sustainability challenges in an increasingly complex operating environment.

The morning concluded with a powerful case study, Asset Management in Conflict Zones, presented by Perth Chapter Committee Member Dale Whelan. Drawing on the example of asset management in Ukraine, Dale explored how organisations continue to manage critical infrastructure under conditions of severe disruption and uncertainty. The session prompted a rich, facilitated discussion on the lessons for Australian organisations, including the importance of preparedness, prioritisation, robust decision-making frameworks and strong stakeholder relationships when operating in challenging or rapidly changing contexts.





SYDNEY

The Sydney Chapter hosted a thought-provoking event in October that brought together industry leaders, professionals, and property managers to explore one of Australia's most important and complex asset classes — residential strata.

The session examined the major risks and opportunities within strata asset management, from building defects and missing records to lifecycle costs and governance challenges that affect both owners and communities. A key theme was how the sector can move from reactive maintenance to proactive, data-driven management practices, using the Australian Building Manual Guideline as a foundation for better systems, accountability, and transparency.

CHAPTER **NEWS**





Key Insights

- Translating build quality achieved during design and construction into sustainable long-term performance.
- Managing liability, procurement, and governance risks in strata portfolios.
- Leveraging lifecycle costing, transparent levy planning, and digital documentation.
- Turning "buyer beware" challenges into opportunities for innovation and confidence.

Speakers drew on key milestones such as the Shergold Weir Building Confidence Report (2018), the NSW Government's reforms, and the Australian Building Manual Guideline (2020) to reinforce that protecting property value is about more than compliance — it's about creating resilient, safe, and sustainable communities.

Expert Speakers

- James Sherrard, NSW Building Commissioner – Department of Customer Service
- Stuart Smith, Managing Director – WebFM, Principal Author of the Australian Building Manual Guideline
- Brendyn Williams, Principal Consultant – Pentagon Management

Each speaker shared valuable insights into how structured asset management, strong governance, and digital tools can transform the way we manage residential property and deliver long-term confidence to owners and residents.

The event also highlighted the power of volunteering through professional bodies — offering opportunities to build confidence, develop leadership and communication skills, and engage directly with industry leaders.

In November, Sydney hosted a panel on how NSW can move from reactive recovery to proactive, risk-informed resilience in asset management. A special shout-out to our Canberra Chapter, who gathered as their own hub to tune into the technical component.

The panel explored the increasing frequency and severity of extreme weather in NSW and what it means for government-owned assets and community resilience. Insights came from:

Amanda Leck, Head of Adaptation, Mitigation and Reconstruction, NSW Reconstruction Authority, on the $300M+ State Disaster Mitigation Plan and tools such as LSPA and CCIRA enabling councils to prioritise resilience upgrades.

Suzanna Remmerswaal, Associate Director, Sustainability & Resilience, AECOM, on integrating climate-risk modelling and nature-based solutions across the asset lifecycle.

Michael Drayton, Market & Product Specialist, Moody's Analytics, on catastrophe modelling and data-driven investment decisions.

Key takeaways

- Resilience is about protecting communities and service continuity—not just hardening assets.
- Nature-based adaptation offers scalable, cost-effective co-benefits.
- Transition risks must be factored into planning and investment.
- Cross-agency and industry collaboration is essential to embed resilience.
- Data and modelling are unlocking smarter, targeted investment pathways.





How Much KNOWLEDGE & EXPERIENCE Protects Your Assets?



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CSAM
Certified Senior Practitioner in Asset Management

CPAM
Certified Practitioner in Asset Management

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Date of Birth Engineers Australia Membership No

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AREAS OF INTEREST (Please tick)

Technical Topics

- ☐ Reliability
- ☐ Availability
- ☐ Maintainability
- ☐ Performance
- ☐ Spares Planning
- ☐ Maintenance Planning and Scheduling
- ☐ Maintenance Plan development and implementation
- ☐ Maintenance Policy/Strategy development
- ☐ Logistics
- ☐ Shutdown planning and the maintenance interface
- ☐ Asset Management
- ☐ Other:

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- ☐ Skills development
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- ☐ Other:

Return completed Membership Application with payment to:
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GROUP AFFILIATION

☐ Young Asset Management Practitioners (18-35 year olds)

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☐ Newcastle ☐ Canberra ☐ Sydney ☐ Illawarra ☐ Mackay
☐ Melbourne ☐ Adelaide ☐ Brisbane ☐ Hobart
☐ Darwin ☐ Overseas ☐ Gippsland ☐ Perth

MEMBERSHIP FEES Effective Jan 2015 (Please tick one membership type only)

Individual Annual Fee (including GST)

☐ Member $190.00
☐ Student $35.00

Corporate Band Annual Fee (including GST)

☐ Unlimited $11,500.00 ☐ 11-20 $3,950.00
☐ 6-10 $2,100.00 ☐ 0-5 $1,100.00

GST (10%) does not apply to overseas memberships.

CORPORATE MEMBER NOMINEES

Gold – 10 nominees, Silver – 10 nominees, Bronze – 5 nominees

	Name	Email	Date of Birth (Mandatory)	AM Council Chapter
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Contact Asset Management Council to provide more corporate nominee details.

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Method of Payment (please tick one and enclose payment)

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☐ Money Order or Cheque drawn in AUD from an Australian bank) payable to **Asset Management Council Ltd**

☐ International Money Order

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(Australian or New Zealand Bankcard only acceptable)

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Beca Limited
Beyond Asset Management
Brisbane Airport Corporation
Bureau Veritas Australia
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Channel Terminal Services
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DCCM
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Department of Planning, Industry & Environment
Egis
Endeavour Energy
Fire Rescue Victoria
Fraser Coast Regional Council
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Fresh Hope Communities
Gladstone Area Water Board
Gladstone Regional Council
Goulburn Valley Water
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