Asset Management Conference
Crown Convention Centre, Perth, Australia, 2-5 June 2014

Program Overview

**Monday 2 June**
- 1.30pm Registration and Exhibition Open
  - Exhibition Hall
- 2.00pm Practitioners Forum - Certification and Certification for ISO Assessors -
  - Plenary Room/A
- 5.00pm Welcome Cocktail Function
  - Sponsored by Institute of Quality Asset Management Exhibition Hall

**Tuesday 3 June**
- 8.30am Welcome and Opening Keynotes
- 10.15-10.45am Morning Tea - Exhibition Hall
- 10.45am Concurrent Streams
  - Plenary Room/A, B & C - Astral Rooms
- 12.15-1.30pm Lunch - Exhibition Hall
  - Sponsored by Asset Management College
- 1.15pm Coach Departure for YAMPs Session off site
- 1.30pm Concurrent Streams
  - Plenary Room/A, B & C - Astral Rooms
- 3.00-3.30pm Afternoon Tea - Exhibition Hall
  - Sponsored by I&E Systems
- 3.30pm- 5.00pm Concurrent Streams
  - Plenary Room/A, B & C - Astral Rooms
- 5.00pm YAMP Networking Evening Exhibition Hall

**Wednesday 4 June**
- 8.30am Welcome and Keynotes -
  - Plenary Room/A
- 10.00-10.30am Morning Tea -
  - Exhibition Hall
  - Sponsored by Teak Yew
- 10.30am Concurrent Streams
  - Plenary Room/A, B & C - Astral Rooms
- 12.00-1.30pm Lunch -
  - Exhibition Hall
- 1.30pm Concurrent Streams
  - Plenary Room/A, B & C - Astral Rooms
- 3.00-3.30pm Afternoon Tea served in the
  - Exhibition Hall
- 3.30-5.00pm Concurrent Streams
  - Plenary Room/A, B & C - Astral Rooms
- 6.15pm Annual Dinner and Awards Night,
  - Fraser's, Kings Park

**Thursday 5 June**
- 9.00am Concurrent Streams
  - Plenary Room/A, B & C - Astral Rooms
- 10.00-10.30am Morning Tea -
  - Exhibition Hall
- 10.30am Concurrent Streams
  - Plenary Room/A, B & C - Astral Rooms
- 12.00-1.30pm Lunch -
  - Exhibition Hall
- 1.30pm Concurrent Streams
  - Plenary Room/A, B & C - Astral Rooms
- 2.30pm Closing Keynotes in the
  - Plenary Room
- 4.15-5.15pm Farewell Drinks and Exhibition Close
  - Exhibition Hall

**Friday 6 June**
- 8.30am- 4.30pm Concurrent Workshops (Botanical Rooms)
  & Site Visits
CONFERENCE PROGRAM
Wednesday 4 June

8:30 Stream A: Keynote Session: Chair: Andrew Morgan
Changing Definitions of Asset Management: Thomas W. Smith, MSc, University of Wisconsin-Madison, USA (AMBoK ID: 1842)

9:15 How IT/OT Integration and the Cyber-Physical World is Changing our Lives and the Way We Are Doing Business: Achim Krüger, Vice President, EAM Solutions, SAP Germany

10:00 Experience leading a Brazilian company certified by PAS 55: Ivalo Fratella, AES Tiete, Brazil

10:30 Morning Tea - Sponsored by Teak Yew

Streams

A: Risk Management
Chair: Thomas Birdseye

B: Continuous Improvement
Chair: Sandy Dunn

C: Forum on Asset Management System Model
Discussion around the Asset Management System Model and Organisational Systems Model
Peter Kohler, Michael Killen, Gary Winsor
(Places are limited, for registration please contact: pmkohler@amcouncil.com.au)

11:00 Extent of Use of Continuous Improvement Process in Engineering Asset Management Practices in Oil and Gas Service Industry in Nigeria
Olajumọ́ A. Ifọrọ̀, Japa Mss. and Products Limited, Philippines (AMBoK ID: 1885)

11:30 Improving Woodside’s Asset Management Capability Using an Integrated Risk Based Inspection System
Matthew Turnbull, Woodside Energy Ltd Perth WA (AMBoK ID: 1838)

12:00 Lunch

Streams

A: Risk Management
Chair: Andrew Snaedsby

B: Benchmarking and Monitoring
Chair: Peter Todd

C: AMPEAK Roundtable Discussion: Performance vs Value
Chair: Malinda Holdsworth

13:30 Evaluation of Risks for Asset Management and Support Services Improvement Projects
John P.T. Mo, Mo, MRT University VIC (AMBoK ID: 1819)

14:00 Development of a Bridge Deterioration Model Using Nonlinear Analysis for Underbridges in Sydney Trains
Azam Khan, Sydney Trains NSW (AMBoK ID: 1820)

14:30 Robust Risk Management is Essential in Asset Management: Why a Spreadsheet will Not Cut it!
Andrew Ferguson, AIP Professional Services SA (AMBoK ID: 1818)

15:00 Afternoon Tea

Streams

A: Tutorial
Chair: Dave Dansereau

B: Business Performance
Chair: Nikola Bonac

C: ISO 5500X
Chair: Robert Sloan

15:30 Measuring Reliability: Tips and Tricks for a Reliability Practitioner
Mark Mackenzie, Noel Bonvicini, K2 Technology VIC
The Tutorial will cover:
• How should reliability be demonstrated/tested
• How to specify reliability requirements
• How to use reliability to focus effort
(Places are limited, for registration please contact: Mo on mbarngh@amcouncil.com.au)

16:00 • Why Measure Reliability and what are the benefits
• How should reliability be demonstrated/tested
• How to specify reliability requirements
• How to use reliability to focus effort
(Places are limited, for registration please contact: Mo on mbarngh@amcouncil.com.au)

16:30 • Building Level of Services and Customer Value into the Decision Making - Sydney Water’s Water Main Asset Management Strategy
David Zhang, Sydney Water Corporation NSW (AMBoK ID: 1833)

14:00 Round Table discussion on the Global Forum on Maintenance and Asset Management Maintenance Management Framework
Presenter: Peter Kohler, AMBoK Commissioner

18:15 Annual Dinner and Awards Night, Prasac’s, Kings Park

CONFERENCE PROGRAM
Thursday 5 June

8:30 Stream A: Maintenance Planning and Strategy
Chair: Arthur Salsman

B: Leadership and Culture
Chair: John Sander

C: Condition Monitoring
Chair: John Sander

9:00 Designing Modern Maintenance Programs for Heritage Rail Vehicles using Heritage Maintenance Analysis Methods
James Kennedy, Interiors Consulting NSW (AMBoK ID: 1867)

9:30 Maintenance of Fixed Assets: Are You Using Your Insight More Often Than Your Intellect?
Dr Carla Brosh, Western Australian School of Mines, Curtin University WA (AMBoK ID: 1877)

9:30 Using Physical Asset Management as a Strategy for the Cultural Transformation of the Department of Public Works and Highways, Through the Bureau of Equipment
Torbiko Noël Iaio, Department of Public Works and Highways, Philippines (AMBoK ID: 1801)

10:00 Morning Tea

Streams

A: Maintenance Planning and Strategy
Chair: Arthur Salsman

B: Leadership and Culture
Chair: John Sander

C: Asset Data
Chair: John Sander

10:30 Effectiveness of the Performance and Reliability Optimisation Model in Electricity Generation
Kriger Visser, University of Pretoria South Africa (AMBoK ID: 1864)

11:00 HTMi’s ‘Fast Track’ to Asset Management Improvement and PAS 55 Certification
Benjamin Stapley, Metro Trains Melbourne (MTM) VIC (AMBoK ID: 1820)

11:30 Managing Maintenance Resources for Efficient Asset Utilization
Winda Cahyo, University of Moolga NSW (AMBoK ID: 1850)

12:00 Lunch - 12:00 Annual General Meeting

Streams

A: Maintenance Planning and Strategy
Chair: Tom Carpenter

B: Configuration Management
Chair: Monique Beedles

C: ISO 55001 Implementation
Chair: Monique Beedles

13:30 Transitioning Rollingstock Maintenance Contracts – Problems & Pitfalls
Brett Wilson, Bombardier VIC (AMBoK ID: 1823)

13:30 Developing and Implementation of an Asset Configuration Management System
Verena Rajanovic, Leighton Contractors Pty Ltd NSW (AMBoK ID: 1837)

14:00 Round Table discussion on the Global Forum on Maintenance and Asset Management Maintenance Management Framework
Presenter: Peter Kohler, AMBoK Commissioner

14:30 Stream A Keynote
Maintainers of the Future
Professor Malinda Hodkiewicz, University of Western Australia WA (AMBoK ID: 1869)

15:15 Closing Address
Leadership, SAMPS, AMPS, and Growing your Business
John Hardwick, Network NSW and Co-Author of Living Asset Management, Sydney

16:15 Farewell Drinks Function and Exhibition Close

Friday 6 June

8:30 - 16:30 Workshops & Site Visit

W1 W2 W3 W4 W5
Can Shared Coal Industry Knowledge be Adapted to Improve Risk Management Outcomes in Other High-Risk Domains?

Philipp Kirschen, Darren Sprung, Minh Phu, AMBoK Id 1807, Extended Abstract

Coal mining is recognised globally as a hazardous activity, and therefore operates under high levels of regulatory and public scrutiny. Other high-risk industries, often associated with the coal supply or energy chains, including power generation and transmission, oil and gas, construction, forestry and mining, also risk shipping all need to manage a workforce operating in a high-risk environment. Further, other energy sectors such as oil and gas also need to manage a workforce in a high-risk environment. ACARP has recently funded RISKiGATE, an interactive online risk management system developed for Australian coal mining industry in the management of potential major incidents. From a broad industry perspective the RISKiGATE platform provides an environment for knowledge capture and knowledge exchange regarding current practice and facilitates a cumulative corporate memory available to all coal practitioners. This paper uses the RISKiGATE framework to classify incident/coincident data from other high-risk industries such as construction, road transportation, tunneling and oil and gas to identify opportunities for applications/adaptation of RISKiGATE knowledge. High-risk industries, such as power generation, construction, railways and road transportation, ports and marine shipping, are encouraged to engage with the RISKiGATE process to improve risk management outcomes across national supply and energy chains.

A Two-Phased Approach for Risk-Based Inspection (PBI) Programmes to Improve the Management of Pressure Equipment Integrity

Steve Matthews, AMBoK Id 1809, Extended Abstract

Risk-Based Inspection (PBI) is gaining increasing acceptance worldwide as the ‘industry standard’ methodology for developing a focus and rigorous inspection programme. The main objective of PBI is to identify and evaluate degradation and damage mechanisms that could affect pressure equipment integrity; identify inspection techniques and inspection inspection campaign on the level of risk associated with these mechanisms, aligned with local legislation and regulations. A two-phase approach has been developed with the objective of improving both the focus and cost-effectiveness of RBI programme implementations. The first phase involves a ‘system-level’ qualitative risk assessment campaign on the level of risk associated with these mechanisms, aligned with local legislation and regulations. The second phase involves semi-quantitative risk assessments and integrity management planning carried out on the individual component level, as applicable to all credible integrity threats. The two-phased RBI approach has been successfully applied to assess the remaining life of the ‘sniper’ project, an important part of one of the Company’s strategic initiatives.

Management Commitment to the Success of the PAS 55 Certification Journey

Paul Cattan, AMBoK Id 1810, Extended Abstract

A leading vertically integrated power utility company in Asia with A$11 billion in assets and more than 31,000 employees knew that to sustain their performance and reputation, and be in operation for many years to come, they need to improve their asset management maturity and therefore the Company President provided a directive that all divisions of the organisation were to be certified against PAS 55. This paper explores the experience of this highly regulated Generation division. The approach started with providing a detailed understanding of what PAS 55 is followed by ongoing guidance through the changes required to achieve the certification. However this journey would not have been successful without the commitment demonstrated by senior operation managers. This paper outlines the RISKGATE with a clear direction outlined by the Company President but also come in the form of sufficient resources, recognition of effort and celebration of success.

Asset Management in Design – what is needed?

Anselm Boehl, AMBoK Id 1811, Extended Abstract

Asset management has been widely accepted across infrastructure heavy industries with a focus on maintenance and reliability. Increasingly this focus is looking towards what life aspects of an asset. As part of this process it becomes obvious that the biggest influence on life cycle cost on an asset is in the design stage of a project. Traditionally, designers have focused on the best technical solution and more recently been exposed to the concept of “Safety in Design”. This paper intends to broaden this concept into “Asset Management in Design” and what is required to achieve this. Areas covered by way of explanation and examples are: What is the end game for an asset in its service delivery? The role and importance of user requirements and functional specification, and with that the role of management; Designing for maintenance, repair, renewal, upgrade, disposal and beyond. The role of the operator in the design process; HAIZD and HAZDOP and the need to broaden; Asset management for designers; The missing feedback loop from asset operation to design.

Increasing Asset Management Maturity at SITA Australia

David Wiley, AMBoK Id 1812, Full Paper, Extended Abstract

A leading resource recovery management organisation with revenue reaching $1 billion, was previously a waste collection business only. This resulted in limited IT systems and asset management systems. There has been a paradigm shift within SITA in recent years and we have experienced a much greater focus on creating asset management in the business. The first order of business was to improve the overall process and the second order of business was to improve the overall process and implement a consistent set of asset management processes and tools across the organisation.

Risk Based Zonal Planning Approach for Distribution Overhead Assets Victoria Hogg, AMBoK Id 1815, Full Paper

This paper presents the author’s experience in developing the RCA and RCM technologies for overhead distribution assets. The author would like to share his experience in developing and implementing the outcomes of the two processes and data influenced by the new technologies. This will be a reasonably difficult challenge to develop viable maintenance strategies for assets. This challenge becomes exponentially more difficult when developing maintenance strategies for assets which have no access and are 600miles below ground. Whether an RCA is performed before an RCM or vice versa does not matter. Both processes complement each other. This paper explains how the RCA was performed first due to number of failures. Followed by RCM to establish the right condition data to include in the deterministic analysis. The processes were based on condition monitoring and what to measure, how to measure it and who would perform the measurement. The RCA process provided a tool and real network data. The modelling tool applied: A set of business rules for asset replacement; A capital expenditure model - driven by the network state, and; A network optimisation algorithm. The network optimisation algorithm calculated the NPV of a network rebuilding project every year over the network. The best NPV strategy was identified and compared against the baseline cost of carrying out continual asset replacement for a 50 year base. This demonstrated that unconstrained lifecycle cost efficiency in the order of 20% could be achieved through optimal timing of network rebuild and discrete asset replacement.

Integration of RCA and RCM Technologies to Develop Maintenance Strategies

Chris Traianou, AMBoK Id 1819, Full Paper

This paper presents author’s experience in integrating the RCA and RCM technologies in a maintenance strategy. The paper will highlight UNE’s comprehensive approach and corresponding widespread benefits.

Enlightened Leadership in Asset Management – Managing Complexity and Growth – where there’s a will...

Graham Constable, Brian Munro, AMBoK Id 1804, Extended Abstract

Public and private sector organisations increasingly require high degrees of business flexibility and scalability to survive and have to embrace advances in IT to improve their ability to satisfy and manage complex networks of customers, suppliers and stakeholders. These organisations also realise how important the sustainable management of infrastructure is to supporting their core work. No more important are these three areas of integration than in the tertiary education sector where institutions face budgetary and operational pressures to attract students and staff. Competing demands for space, resources and money add to their challenges.

Paul Blackmore, Management Decision Optimisation

Within the University of New England (UNE), there is a refreshing level of innovative thinking that frames high levels of collaboration between operational, financial and academic staff; the integration and alignment of corporate vision and faculty strategic plans with the myriad concepts of strategic asset management is palpable. UNE is demonstrating leadership in the implementation of its change management plan, incorporating the cultural and people side of introducing a strategic asset-based approach to realising its strategic objectives. This paper will highlight UNE’s comprehensive approach and corresponding widespread benefits.

Risk – The Common Language of Asset Management Decision Optimisation

Paul Blackmore, AMBoK Id 1805, Extended Abstract

Consensus of asset-related decisions in each stage of the asset lifecycle requires a mature understanding of costs and consequences. Consequences may be positive, negative, tangible or intangible. However, how quantitative risk analyses can assist with translating the many disparate variables associated with assets to a common language, facilitating comparison of options and enabling optimisation. We discuss the benefits of quantitative techniques over qualitative approaches highlighted by risk matrices including a discussion of some of the critical things that you can do to ensure that a successful outcome can be achieved? Step 1. Decide who will participate. Step 2. Preparation. Step 3. Conduct the RCA, Step 4; Second Look; Step 5. Reporting. Step 6. Success. The only reason to investigate a problem is that it is significant and of strategic importance; this achievement is true, then the outcome must also be beneficial and provide a payback on the effort spent investigating. It is therefore important that the facilitator delivers the goods. There are many aspects that go into a successful facilitation. This paper presents these critical elements that are common to those who facilitate successfully.

Network Rebuild Investment Optimisation

Victoria Hogg, AMBoK Id 1814, Full Paper

The Western Power distribution network underwent a major expansion in the 1960/70s – with an expected life of 50 years, many of these assets are approaching end-of-life. While it is recognised that rebuilding sections of network can be more cost effective, then discrete asset replacement, the heterogeneous nature of the network (due to incremental growth, discrete asset renewal and maintenance) makes the determination of the optimal timing for rebuilding a challenge. A method for optimizing network investment over a 50 year period was developed and tested using a modelling tool and real network data. The modelling tool applied: A set of business rules for asset replacement; A capital expenditure model driven by the business risk. An operating expenditure model – driven by the network state, and; A network optimisation algorithm. The network optimisation algorithm calculated the NPV of a network rebuilding project every year over the network. The best NPV strategy was identified and compared against the baseline cost of carrying out continual asset replacement for a 50 year base. This demonstrated that unconstrained lifecycle cost efficiency in the order of 20% could be achieved through optimal timing of network rebuild and discrete asset replacement.
Promoting AM Accountability via Bipartisan Governance Arrangements

Matt Henson, AMBoK Id 1820, Extended Abstract

The Sydney Catchment Authority (SCA) utilises a bipartisanship asset management governance structure. This structure promotes separate responsibilities for both the strategic and tactical roles in asset management, ensuring clarity for asset management accountability, which is acknowledged throughout all phases of the asset lifecycle. Definiton of the accountabilities as Asset Stewards (strategic) and Asset Custodians (tactical) promotes a separation of roles and thereby buy-in of the process throughout the organisation. By ensuring assets are managed consistently with a common language supported by standardised procedures and tools within the Asset Management System (AMS), organisational unity is promoted by a common language and a shared asset management system. The AMS consists of numerous ISO asset management systems, common elements of which are managed collectively to ensure consistency of administration. Utilisation of standardised practices throughout the AMS and IMS is particularly important when embedding the accountability that defines input to other elements within the asset management lifecycle phases, otherwise preserving isolated work practices that don’t contribute to continued improvement.

Flexible Development of Asset Category Specific AM Plans

Matt Henson, AMBoK Id 1821, Extended Abstract

The Sydney Catchment Authority (SCA) is developing a suite of asset management category specific Asset Management Plans (AM Plan) that facilitates optimal decision making by identifying and assessing the performance requirements and risks of each asset. The AM Plan was intended to be the tool which provides the information and analysis to allow the SCA to optimise asset lifecycle costs, meet specified service level requirements and mitigate risks to a level that is reasonably practicable and acceptable. The SCA recognised that the AM Plans are being undertaken across the organisation by various teams, with limited guidance and integration. The primary challenge between each asset category precludes use of a standardised template, development of the AM Plans has rather adopted a flexible approach responding to situation specific management priorities. These high level priorities consider the following themes for each asset category – overview, objectives, performance, decision making, investments and flexibility, and then the document maintains ‘ownership’ of their document, thus ensuring that the plans and their integration within the business planning cycle.

Asset Integrity Management: A Structured Approach

Martin Brown, Alexandra Knight, Dr Steven Wagstaff, AMBoK Id 1822, Extended Abstract

Managing any asset portfolio, and the most important asset throughout its lifecycle is a balance of risk, cost and performance. A targeted Asset Integrity Management (AIM) strategy should be considered whenever the structural integrity of such an asset could have an effect on its through-life cost, safety or availability. Typically, the factors which may compromise the structural integrity of most assets are ageing, usage, damage, environmental effects, repair, rework or combinations of these. In essence, AIM is a multi-stage approach to manage the structural integrity of any asset throughout its entire lifecycle – starting from its design inception and ending at the point of disposal. AIM takes the core integrity of an asset as its starting point, and uses a full appreciation of the integrity to generate a rigorous yet cost-effective inspection and maintenance regime. An AIM strategy typically involves the development of an Asset Integrity Management programme. Asset Management itself is not new – but the practice of taking the core integrity of an asset as a starting point and then developing an inspection and maintenance through-life management plan around it is something which could offer significant benefits to an organisation that owns high value and critically important assets.

Preparing for ISO 55000 – Developing a Global Facility Asset Management Framework – Including a Case Study at Olympic Dam

Kevin Leeder, AMBoK Id 1823, Extended Abstract

Sodeco employs over 430,000 people and provides service delivery to clients in over 80 countries. Sodeco embarked on a major project to develop a Global Asset Management Framework to drive standardisation, consistency and share best practices across the organisation. The British Standard Institute’s asset management framework, ISO 55000, was identified as the most appropriate framework to meet Sodeco’s global facility management requirements. This decision also prepared the ground for the future expectations of the ISO 55005 suite of asset management standards. A core team of specialists representing each global region was formed to manage the AMP project. The framework was developed in four levels of hierarchy including, asset management policy, AMP core processes, local operating procedures and technical standards. The Sodeco process that was implemented to deliver a successful project including, global team structure, preparation of the framework design, and development of each specific framework element. The paper and presentation will then go on to explain the deployment of the AMP to deliver the facility management at selected global facility management contracts, and specifically refer to delivery of facility management services to BHP Billiton at the Olympic Dam (mine site villages and Osborne Downs Tunisite) in Western Australia.

Transitioning Rollingstock Maintenance Contracts – Problems & Pitfalls

Brett Witcomb, AMBoK Id 1825, Extended Abstract

In recent years it has become increasingly common to privatise public transport services and asset ownership. In particular trains and trams, this move has been either a complete change of ownership or a mixture of ownership and the identification of just the maintenance aspect of the operations. Over the last ten years, Bombardier Transportation Australia, has mobilised eight rail maintenance projects with five different customers. These projects have involved a combination of Bombardier manufactured units as well as ROLgunstock manufactured by other companies. When transitioning a maintenance business, each stakeholder, from the customer to the travelling public and even various functions your own business, has a different opinion about what the line of sight is at the time they are getting. The key to a smooth transition is in the preparation of a plan. A successful plan is one that has the ability to adapt to any changes that may occur during the transition, ensuring that a “Plan B” is in place for critical areas, i.e. Day Operations, IT, etc. The plan to introduce a new product will always differ slightly to the transition of an existing, however, the core rules remain the same, deploy from a defined plan and communicate effectively with all stakeholders.

Development of a Bridge Deterioration Model Using Nonlinear Analysis for Underbridges in Sydney Trains

Aamir Khan & Ehsan Khan, AMBoK Id 1828, Full Paper

Recent under bridges are an essential and integral component of a safe Rail network. As our Rail network ages, many bridges are becoming obsolete. This obsolescence is a result of natural deterioration, of the materials used in construction, and of earlier design standards that no longer accommodate the speed, dimensions, loads, and volume of modern traffic demands. The Sydney Trains maintains an inventory of over 423 under bridges, 908 overbridges and 288 footbridges across its whole network. The current network inspection plan is a detailed inspection every two years and a mid-cycle inspection binarially in between detailed inspections. Bridge inspectors are required to assign a subjective condition rating score of brittle to excellent. This score depends on an evaluation of the capability of the bridge to immediately stopping the trains to report in the bridge examination report. The development of Sydney Trains bridge deterioration model is a particularly similar in the approach to the Markov chain models. Stochastic condition rating and it assumes that an under bridge can either remain in the current state or transition to another state. The condition rating information is extremely valuable for making bridge management decisions and development of Technical Maintenance Plans. Based on the Webdel analysis, the deterioration path for key deterioration elements in Sydney Trains have been presented in this paper.
A Review of Data Visualisation for Asset Management Key Process Indicators and its Potential Impact on Quantitative Information Communication

David Caro, AMBoK Id 1831, Extended Abstract

Visualisation of Key Process Indicators KPI is a challenge to asset management professionals, the use of tables, graphs and charts has been commonly used to communicate quantitative information in several organisations, nevertheless relevant information remains concealed by the use of bulky design practices, rendering many communication efforts, ineffective. Proper data visualization and analysis can significantly improve decision making in the asset management and maintenance area. Lycodorum Asset Management has begun exploring different models and concepts to improve communication design practices making communication efforts efficient and effective. The purpose of this extended abstract is to share the initial results of the assessed conceptual models and will include: A brief description of each model and concept, An explanation of the implementation requirements, Potential advantages and disadvantages; and Visualisations and analysis samples. Some of the models discussed in the extended abstract will be: Dynamic charts; Time based interactive visualisation; spark chart data (Radar, Bubble, etc.); Sparklines: Small line charts without axes or coordinates that represents trends; Box plots: Charts that represent groups and their respective quartiles; Trellis plots. Layout of smaller charts that represent parts of a conceptual whole.

Production Reliability Analysis to Improve Asset Management

Weylon Malek, AMBoK Id 1832, Extended Abstract

This paper presents the benefits of utilising Weibull Process Plots to analyse daily production data to identify improvements in asset management. The use of Weibull Process Plots provides a ready means to identify trends and other chronic and/or Reliability issues. The benefit of discovering the gap between naming completion and project delivery can provide a ready means to identify and target improvements. These improvements can be quantified using “what if” simulations in a System Availability model. This can then be used to present opportunities for reducing maintenance costs and increase reliability.

Build Level of Services and Customer Value into the Decision Making – Sydney Water’s Water Main Asset Management

David Zhang, AMBoK Id 1833, Full Paper

Sydney Water’s water network consists of about 21,000 km of water mains. Sydney Water is a statutory state owned corporation, with the Department of Planning, Industry and Environment (DPIE) as the economic regulator. Sydney Water has developed a comprehensive set of decision frameworks and business processes to manage the life cycle of water main assets to achieve a desired level of service and financial return within an acceptable risk. With the current constrained financial environment, affordability is the most imminent issues before water industry as customers is seeking value for money. It is required us to reduce capital investment programs and deliver effectively and efficiently, while improving customer expectations. This paper presents the analysis the asset performance are against the level of services and details how Sydney Water explores the opportunities to build the level of services and customer value into the asset management strategy and decision framework to optimise the capital investment programs.

Effectiveness of the Performance and Reliability Optimisation Models in Electricity Generation

Urge Visser, Wilson Kudiru, AMBoK Id 1834, Full Paper

Since 2008 the electricity supply in South Africa has at times been unable to fulfil its growing demand for electricity. Various assets are available to the Eskom assets such as load shedding to the capacity or reducing the demand. One of these initiatives was the introduction of a performance and reliability optimisation (PRO) model at 13 stations in South West. The primary aim of the model was conducted to determine the effectiveness of the PRO model and to determine whether it was increasing plant availability and in reducing energy losses. The expectation was that the PRO model would also increase plant performance through increases in preventative maintenance compliance. This paper discusses an analysis of maintenance history from SAP reports and other performance data at the power stations as well as a survey from 70 respondents. The investigation indicated that the plant performance did not improve significantly after implementation of the PRO model although there was a significant improvement in preventative maintenance and schedule compliance. A number of factors that contribute towards poor plant performance were also identified and ranked. The survey indicated that the age of the plant, lack of discipline and production pressure were major contributors.

Improving Project Delivery – Will the New Asset Management System Standards Series ISO 55000 Make a Difference?

Ernst Krauss, AMBoK Id 1836, Full Paper

Project Managers are striving to a degree that usually gets vitiated numerous times, is change of resources, and, required considerable effort to deliver. Skills shortage and lack of experience are often blamed for inadequate outcomes in Project delivery. Increasing complexity of project delivery challenges not only the Project Manager, but discipline engineers and Owner personnel equally. Owners often experience significant issues in starting up new plants, maintaining those plants and most of all do not get the expected benefit (production and revenue) from the beginning of a new Operational Project. Delays in Operations Projects with Operations embedded in Operations personal in Projects, delivering also “Operational Readiness”. Why has nothing changed significantly? Observing major project outcomes and the value erosion experienced, indicates the need for radical improvement and change of project delivery strategy.

Train Unloading Facility Defect Elimination Program

Cristiano da Costa Cunha and Indra Gunawan, AMBoK Id 1837, Full Paper

A total of 4% of availability increase was achieved in an Iron Ore Train Unloading Facility a Six Sigma approach, supported by statistical techniques such as Pareto and Jackknife, is used to identify the main causes of loss and implement corrective actions, based on repetitive data collected from the use model accounting system. A classification method was utilized to separate production delays into different categories and target the focus of the defect elimination program. For each cause analysis and fishbone diagrams, effective defect elimination tasks are identified to eliminate the problem: root-cause analysis and effective resource allocation are utilized to achieve an increased value adding defect elimination strategy. A control process of ongoing monitoring and analysis allows to maintain sustainability of the program throughout the lifecycle of the asset and continuously improve availability. A total of 3.3 Mt of increased iron ore production per annum through Unloader facility was the result observed in the last 12 months.

Case Study – Balancing Capital Efficiency with Optimising Operational Performance

Joshua Jardine, AMBoK Id 1838, Full Paper

Presentation of a case study demonstrating how involvement of Asset Management specialists in the early project phases (planning and detailed design) lead to formulation of valuable decision support tools. Options analysis models were built establishing that additional CPEX of ~$3bn (on a $12 Bn project) could accomplish potential NPV (Net Present Cost) savings of some $840M while enabling some $4bn in other benefits and value in areas such as safety. Furthermore, improved asset availability could also be achieved rendering potential revenue gains of ~$480M for the first 3 years. Improvement of ~$1bn per year was high if in the opportunity for balancing capital efficiency with operational performance optimisation across asset lifecycle. This evidence can be used to support management discussions or for the need for creating operational solutions to problems that may have been “designed in”, both of which can be costly.

Changing Definitions of Asset Management

C. T. Smith, AMBoK Id 1839, Full Paper

The International Organization for Standardization (ISO) 55000 Standard for Asset Management represents a significant change to our understanding of asset management as it brings broader activities associated with asset management and moves them in several new directions. From tactical to strategic; From isolated life phases to a full lifecycle view. From individual assets to assets and systems of systems; From program management to a management system. And to moves asset objectives from a performance focus to a value focus. Overall, the standard will elevate the status of asset management in many organizations and formalize its contributions. Asset managers at all levels need to understand these potential changes and be ready to meet the new challenges that they impose, as well as take advantage of the new opportunities they offer. It is evident that this is a major step forward towards a “make a difference” philosophy that will incorporate the whole lifecycle view and moved up to a portfolio view of assets as systems. The new standard encompasses this whole pyramid.

The Role of Asset Maintenance Organisations in Improving Return on Assets

Ankur Baner, AMBoK Id 1840, Extended Abstract

The worldwide assets management industry is a $4.5 trillion market, and it is growing. By 2022, Oil & Gas will contribute substantially to the economy through the next 30 to 40 year asset lifecycle. Organisations engaged in engineering maintenance, preservation, and the like are seeking opportunities as a challenge to demonstrate technical leadership, cost efficiency, flexibility and innovativeness in making these assets outperform their projected returns. This abstract and ensuing presentation will investigate how core maintenance services such as asset preservation and fabrication using leading edge technology can help expedite start up on greenfield projects as well as reduce lead times on brownfield projects in an environmentally friendly manner using asset preservation techniques; for production and transmission facilities as a case study, the extended abstract will investigate the criticality and enormity of the management and operations asset management demand to our understanding of asset management. It broadens the activities associated with asset management and formalizes its contributions. And it moves asset objectives from a performance focus to a value focus. Overall, the standard will elevate the status of asset management in many organizations and formalize its contributions. Asset managers at all levels need to understand these potential changes and be ready to meet the new challenges that they impose, as well as take advantage of the new opportunities they offer. It is evident that this is a major step forward towards a “make a difference” philosophy that will incorporate the whole lifecycle view and moved up to a portfolio view of assets as systems. The new standard encompasses this whole pyramid.

Delivery reliable customer Outcome Through performance Based Maintenance Service

Alan Roland, Adel Ali, AMBoK Id 1844, Extended Abstract

The Main Roads is one the key Divisions of the Department of Transport (DoT) maintaining a network of approximately 10,000 lane-km and the network
is growing rapidly due to increased demand and economic development of the Abu Dhabi Emirate. The traditional way of construction and maintenance is based on a "measures and value" i.e. the amount of work being measured and paid for on agreed rates for different work items. Consideration is given to the Performance Specified Maintenance Contracts (PSMC) as medium to long term alternative that will define the minimum conditions of highways, road structure. A pragmatic approach and ongoing commitment from the DOT – Main Roads management to improve the decision making process can have a positive effect on successful PSMC implementation. It will trig the stakeholders to put in place the necessary tools to make the new approach work and to build industry capability and capacity. This paper provides a brief background on Performance Specified Maintenance Contracts (PSMC) and a pilot project recently implemented, describes the main reasons for such PSMC contracts for Abu Dhabi Emirate, presents a spectrum of performance indicators and response times, gives special attention to the performance specifications and control procedures.

**Are Your Decisions Truly Optimal?**

Boudewijn Neijens, AMBoK Id 1847, Extended Abstract

As asset managers are faced with the need to make decisions every day. Often these decisions involve selecting one project over another, based on which project brings the highest value to the corporation. But how exactly do we quantify value? Are we sure that we’re picking the right projects? Are the decisions we make truly optimal and defensible? Join Cappeller for an interactive session exploring how to optimize portfolios of projects. Participants will be challenged to value and rank the various projects of a sample portfolio while respecting multiple financial, technical and time constraints. We will gradually iterate towards the optimal portfolio, while at the same time discovering the challenges presented by real-life scenarios where subjective to numerous constraints might be competing for scarce resources. To conclude we will highlight the benefits of optimization over more traditional ranking or prioritization techniques.

**Effective Asset Management Programs through Open Data Systems and Mobility – Global Best Practice Cases Study**

Das Drum, AMBoK Id 1850, Full Paper

As asset management processes evolve with the introduction of ISO55000, the ways of collecting and consuming information must also change. New and innovative asset management practices and programs are being developed to meet these new challenges. Effective asset management programs need data systems that speak to each other – Open systems, inter-departmental, and user-friendly ease-of-use from diverse levels of knowledge across the work force are critical to gaining company-wide compliance and productivity through the use of the same source of asset management information. This paper identifies key factors in global best practice. Find out how the South African Department of Foreign Affairs manage their asset base across 192 countries using mobility, how one of Australia’s leading Defence and service companies in the field of lifting and rigging equipment – A. Noble & Sons Limited have even increased their fleet size from 20,000 assets Australia-wide since 2007, and how South Australian Police maintain their radio and traffic cameras across the State. All 3 organizations have successfully implemented a common management system which puts input and use of information across multiple levels of users from data collection through to Finance, Operations, and QMIS compliance.

**Managing Maintenance Resources for Efficient Asset Utilization**

Winda Nur Cahyo, Khaled El Akrouzi, Richard Dwight, Tieltang Zhang, AMBoK Id 1850, Full Paper

Efficient asset utilization can be measured by many performance parameters. Asset productivity is one measure of how efficiently an asset is deployed and maintained. In a company looking to implement an appropriate maintenance resource management will enhance utilization of asset and improve asset productivity. In this paper, a policy to manage efficient asset deployment is developed covering human resource and supporting material required to perform maintenance activities. The methodology encompasses policies for recruitment, training, and outsourcing. Supporting material management includes policies for procurement of critical asset parts. This will provide an efficient and effective environment for improving asset productivity while using maintenance resources to their maximum potential. This policy includes in-house maintenance, maintenance outsourcing, and maintenance resources required for the maintenance of assets. The paper presents the combined criteria at the related departments for efficient asset utilization.

**Condition Monitoring Programs Defined as a Process with Performance Measures at Each Step. Leads to Precision Maintenance Initiatives which Eliminate Systemic Problems.**

Chris Purska, AMBoK Id 1851, Full Paper

For many organisations Condition Monitoring (CM) programs have plateaued and are not returning maximum benefits. The steps undertaken in any CM program can be characterised in the form of a process map. Establishing performance measures for each step identifies where an organisation’s CM program has plateaued. Where it is “STUCK”. Clarification of purpose and focussing energy on the correct top in the process can result in optimisation.

This paper explains the process map and gives several examples of performance measures for each step. An effective CM program should be identifying and solving through the use of Precision Maintenance Initiatives. The paper presents the fundamental “WHY” behind Precision Maintenance, in the language of equations that Engineers understand.

**The Uncertain Future: Planning for Alternate Realities**

Anna Robak, AMBoK Id 1852, Full Paper

Our assets are expected to last up to 100 years, but might not become obsolete and will be replaced at speeds we would not have thought possible only one hundred years ago, and communicating in ways that were only science fiction thirty years ago. Even the possibility that the nature of our services could drastically change within our assets’ lives, it is only prudent that we consider alternate realities when planning for future services. This paper explores the possible outcomes of a handful of future scenarios, including: Physical resources are irreplaceable factors to meet the demand for services; The impact of the future market on the level of service and future operations and maintenance costs. The Department of Transport (DoT) – Main Roads (MR) is managing, operating and funding for services for approximately 15,000 kilometres within Abu Dhabi Emirate. The network is growing rapidly as a consequence of population, asset growth and other improvements carried out by the DOT where road projects are vested and handed over by a third party. As asset management, four typical applications, including construction quality control/quality assurance (QC/QA), layer modul estimation, estimation of remaining service life and possible future changes for the asset are studies to assess the possible future changes for the asset and other improvements carried out by the DOT where road projects are funded/ vested and handed over to a third party. As part of asset management, four

**Estimating Optimal Long Term Funding Allocation Systematic Approach based on Network Needs & Availability**

Alman Roland, Prof. John Yeaman, Prof. Mark Porter, AMBoK Id 1853, Full Paper

Roads are usually funded through budget allocations determined as part of annual government budgetary processes. Roads with different characteristics and functional classifications may be managed by different road agencies or regional authorities and the financial resources required to maintain and replace these assets are allocated from different sources. For example, most state and local governments provide funding for roads, and municipalities provide funding for sidewalks, and transit systems. The aim of this paper is to develop a model to develop a model to provide a basis for analysis to determine the combined criteria at the related departments for efficient asset utilization.

**Improving Points Reliability on Perth’s Metropolitan Rail Network – A Case Study**

Rebecca Taylor, Simon Ayres, AMBoK Id 1854, Full Paper

With increasing patronage demand on Perth’s metropolitan rail network, improved reliability of the infrastructure and reduction of consequential delays is becoming increasingly important. In recent years, one of the major impacts affecting the reliability of train service operations have been attributed to points assets. Points provide the means for one train to pass from one train line to another, based on which project brings the highest value to the corporation. But how exactly do we quantify value? Are we sure that we’re picking the right projects? Are the decisions we make truly optimal and defensible? Join Cappeller for an interactive session exploring how to optimize portfolios of projects. Participants will be challenged to value and rank the various projects of a sample portfolio while respecting multiple financial, technical and time constraints. We will gradually iterate towards the optimal portfolio, while at the same time discovering the challenges presented by real-life scenarios where subjective to numerous constraints might be competing for scarce resources. To conclude we will highlight the benefits of optimization over more traditional ranking or prioritization techniques.

**The Role of Condition Benchmarking in Asset Management, Case Study for Pavement Asset in Abu Dhabi – UAE**

Alman Roland, Daisi Ledermann, AMBoK Id 1859, Extended Abstract

Best practice asset management involving benchmarking to ensure that a continuous improvement cycle is maintained. Infrastructure assets benchmarking incorporates the level of service, performance, condition, safety and environmental effectiveness. It is important to consider alternate realities when planning for future services. This paper presents a case study where all the above tools are used to evaluate the condition of a road network that operates in a complex environment with a number of stakeholders, including road users, government agencies, and private sector companies. The research will provide a solid basis for a systematic approach and resulting a tool for assessing fund consideing various scenarios. This system will be flexible and can be adjusted to provide a confidence to the road authorities and governments on needs versus available revenue. The system also will assist the government funding agency to compile and integrate funding request from various authorities to optimize fund bids. This research will be unique in that it will provide the road network owner’s view point and be driven by value for money rather than profit whilst meeting the fundamental principles of sustainability, innovation, and risk management.

**Financial Return of the Performance Culture**

Mark Broussard, AMBoK Id 1859, Full Paper

In 2012, Strategic Asset Management (SAM) introduced a unique approach to organizational improvement called The Performance Culture™. The concept and model of The Performance Culture™ was theorised and refined over four phases, each with three supporting elements. Two of the enabling elements, Purpose and People, focus on leadership and organizational development. Two of the performance elements, Process and Performance, focus on elements which drive the financial results of the enterprise. To achieve the desired results, these two elements should also change and invest in certain aspects of managing it effectively. The paper identifies key variables for implementing The Performance Culture™. This paper illustrates how asset management drivers are influenced by a number of factors which include: cost drivers, risk and opportunity drivers, regulatory compliance drivers, and other factors which influence the financial performance, and the interrelationships of the variables involved in the process. Financial improvement and predictable levels of return—no matter what the economic conditions—are critical and compelling case for companies to consider implementing the Performance Culture™, as well as improved performance throughout an organisation.

**Extent of Use of Continuous Improvement Process in Engineering Asset Management Practices in Oil and Gas Service Industry in Nigeria**

A systematic approach to realizing the extent of problems associated with assets and providing mechanisms for improvement is offered by Asset Management (Wilson, 2009). Continuous Improvement Process (CIP) is a systematic approach to improving an organization with small incremental steps, over time (Irani and Sharp, 1997). The continuous improvement process is an ongoing activity and there is dearth of information on its usage in engineering asset management (SIA and the Oil and Gas Services (OOS) industry.
in Nigeria needs the highest level of focus. The study therefore, examined the extent of the use of CIP in EAM in the OGS industry in Nigeria. The research covered 60 OGS companies in Nigeria. Data were collected through questionnaire and were analysed using descriptive and inferential statistics. The findings revealed that CIP was recently embraced by many companies and that their assets performance level. The study concluded that OGS industry were practising EAM and had introduced CIP

Integrating Asset Management across Fremantle Ports

Alessandra Mendes, Rouzbeh Pourazim, Steve Marley, Dario Vallini, Hessam Mohseni, Frédéric Illin, AMBoK Id 1885, Full Paper

Asset ownership is a significant cost to Fremantle Ports and developing a best practice strategic asset management (SAM) framework that provides a simple, logical and innovative approach for optimising the whole of life cycle cost of asset delivery in meeting the agreed levels of service and risk exposure has been a corporate priority over the past years. With the development and implementation of the SAM framework well underway, Fremantle Ports now focuses on the integration of asset management practices across the business, from operational through to tactical and strategic planning. A pilot project has been proposed to assess and improve asset management practices across one of Fremantle Ports’ most critical asset classes, the wharves and jetties. This paper reviews the findings and challenges of this project and the various tools that were developed, including a flexible cost model. This model is based on asset condition and related deterioration curves that allow for remaining life. In addition, the model enables the selection of most cost-effective rehabilitation strategies while considering risk profile and available funding, assisting Fremantle Ports in decision-making processes by providing an actual and optimised lifecycle cost plan.

A Tool to Investigate the Status of Engineering Asset Management in Organizations

Khaled El-Akrut, Richard Dwight, Teiling Zhang, AMBoK Id 1887, Full Paper

The paper defines Engineering Asset Management (EAM) as a system and establishes a framework for it that addresses a set of activities used by managing engineering asset related activities. The framework is proposed to guide organizations in investigating if the status of the EAM system that they have in place is adequate to serve the intended objectives. It also serves as a guide for researchers in EAM. A ‘retroactive’ approach in the context of case studies is shown in order to assist in the development of the framework.

Designing Modern Maintenance Programs for Heritage Rail Vehicles using Heritage Maintenance Analysis Methods

James Kennedy, Jennifer Edwards, Peter Kohler, AMBoK Id 1887, Full Paper

The development of preventive maintenance programs for regularly used productive equipment, using modern risk based analysis techniques such as RCM, is well documented in the public domain. Not so the development of preventive maintenance programs for leisurely utilised safety critical equipment. Operating large heritage rail transport equipment on the public rail system amongst normal traffic presents some unusual challenges. Large steam locomotives consists having up to 20 fully occupied historic carriages, even when required for only a handful of days per year, must be as safe as normal well used rail traffic yet be cost effectively maintained by a mixed group of paid and volunteer staff. This paper presents a successful application of a “heritage” maintenance analysis process, developed in the mid 1970s and last used almost 20 years ago in power stations. Our system development, to develop a cost effective and defensible program for the working carriages of the Rail Transport Museum at Thirroul in New South Wales. The paper will demonstrate how decades of experience was cost effectively harvested to develop a defensible preventive maintenance program, which achieved our objectives. The paper will reflect on the unique usage of Heritage assets designed for commercial operation more than 80 years ago.

Asset Health Management – A Strategic Perspective

Yvonne Power, AMBoK Id 1888, Extended Abstract

The Australian Resources Industry is continually looking for ways to reduce operating costs, increase safety and to optimise asset performance. While initiatives such as implementing remote operating centres, installing on-line condition monitoring sensors, phasing out legacy data analysis and engineering specific equipment manufacturers to provide specialist diagnostic services provide short term benefits, organisations must consider having an Asset Health Management (AHM) strategy as a long term approach to managing asset performance across the life of the asset. This paper presents an overview of AHM as a strategic initiative. It presents Asset Health Management strategies which have been successfully implemented at Transfield Services. Within large-scale technical operations, the long challenges of implementing these strategies at all levels within an organisation from those in the field to upper level management. It also presents some of the benefits of implementing methods which are sustainable and suitable for the long term benefit of the organisation and the industry as a whole.

Maintainers of the Future

Professor Melinda Hodkiewicz, AMBoK Id 1889, Full Paper

In the last two decades we have seen significant changes in how engineers are trained and the roles of operators due to advances in process control, remote operations systems and development of autonomous assets. However the day to day work of maintenance technicians remains the same – to ensure the physical service sectors have changed very little. This paper looks at trends in asset management particularly with respect to assets in remote locations and how these trends might affect the role and competencies of our maintainers of the future.

Maintenance Evaluation Case Study

Geoffrey Fox, AMBoK Id 1871, Extended Abstract

This paper details a case study at a mining and mineral processing operation. Bluefield Asset Management Services conducted a “Bluefield Evaluation” which looked at the equipment throughput and how it was impacted by the quality of the maintenance strategies being employed and the quality and consistency of the execution of those strategies in the field. Producing high quality equipment maintenance strategies and maintenance instructions is vital to achieve world class reliability and maintainability. Well thought out, consistent and defensible work instructions define the quality standard required in the field, and support and motivate the field personnel as they strive to achieve quality and consistent execution of that work. The Bluefield evaluation identified specific improvements in the work instructions and the maintenance strategies to remove ambiguity and increase the subjectivity of the inspections. However, more importantly, the evaluation and subsequent improvement program allowed the site to obtain the necessary information to improve their inspection processes within the organisation. The improved work execution quality provided rapid equipment reliability improvements and a stable foundation for the Bluefield intervention to be effective. This paper presents key findings of the evaluation, the underlying causes, the actions identified and the progress which has been made in implementing them.

Improving Woodside’s Asset Management Capability Using an Integrated Risk Based Inspection System

Matthew Turnbull, AMBoK Id 1876, Extended Abstract

Woodside is Australia’s largest independent oil and gas company, which has a diverse range of assets operating in a number of countries. Woodside produces around 950,000 barrels of oil equivalent each day and operates diversified facilities which we operate on behalf of some of the world’s major oil and gas companies. Woodside strives for excellence in safety and environmental performance and continues to strengthen relationships with customers, co-venturers, governments and communities to ensure we are a partner of choice. In 2010, Woodside embarked on a large scale, multi-year programme to implement Bentley’s world class integrated risk based inspection system, AssetWise Hara Performance Management. Learn how the team implemented an integrated Inspection Data Management system (IDMS) to help Woodside establish a single source of truth for inspection information, advancing our journey towards production excellence.

Exploring the Effect of Political Risks in Large Infrastructure Projects in Politically Unstable Countries

Saeed Mirza, Azam Khan, Daniyal Milan, AMBoK Id 1877, Extended Abstract

This research aims to explore and identify political risks on a large infrastructure project in Pakistan, while taking into consideration whether sufficient objective information can be gathered by project managers to be able to utilise risk modelling techniques. During the study the political situation progressed from a disequilibrium environment to a chaotic situation. The study shows that a detailed project study of the Naeemul_Jehum Hydroelectric Project in Pakistan, implements a probabilistic model using the principle of decision decomposition and Bayesian probabilistic theorem and answers the question: was it possible for project managers to obtain all the relevant objective data to run a probabilistic model?

Synergy Between Methodology and Technology to Improve System Performance

Sridhar Ramakrishnan, AMBoK Id 1885, Extended Abstract

There was an opportunity to eliminate a bad actor on our expansion project through a combination of robust asset selection methodology (RCM) and utilization of a novel tool (Production Simulator). Boiler feed water is the heart of any SAGD operation. However, ensuring improvements in the supply of high pressure feed water to the boiler is a challenging task because the process design is a complex network of heat exchangers and prine-movers, controlled and protected by advanced instrumentation and control systems. Failure of assets in this complex network interrupts steam generation, directly causing deleterious effects to the production process. This is especially critical during褐 (brown) out failures in the production process. With Fujian from the senior management was selected by the following condition and gathering of the RCM analysis with right skill-set. On many occasions, operational and maintenance strategies were developed with the assistance of operations staff with very little input from operators. By using data collected and analysis, effective collaboration with operations helped us utilise simulation producer to be trained and equipped to utilise the right skills for the right questions of RCM “what happens when each failure occurs”, and “in which way does each failure matter”. RCM helped us develop a robust maintenance and reliability strategy for a critical system having over 100 tagged assets, in addition to some re-design recommendations one of which can save up to $1 Million as failure avoidance cost. By identifying the right training, competency, and implementing the recommendations fully within a specific timeframe, we expect to save millions of dollars across these systems.

Asset Management Stewardship and Best Practice in Toll Road Operations and Infrastructure

George Vasiliadis, David Evans, Heinz Volma, Les Hill, Mike Mundy, AMBoK Id 1896, Full Paper

Transfield Services has considerable experience in operating and maintaining major toll roads such as Clyde and Eastern Link in Melbourne since 1999, and more recently the M2/Lane Cove Tunnel in Sydney since 2007. Known as TransTech, our approach to Operations and Maintenance (O&M) and modelling analysis, effective collaboration with operations helped us utilise simulation producer to be trained and equipped to utilise the right skills for the right questions of RCM “what happens when each failure occurs”, and “in which way does each failure matter”. RCM helped us develop a robust maintenance and reliability strategy for a critical system having over 100 tagged assets, in addition to some re-design recommendations one of which can save up to $1 Million as failure avoidance cost. By identifying the right training, competency, and implementing the recommendations fully within a specific timeframe, we expect to save millions of dollars across these systems.

ASSESSMENT COUNCIL
Assetivity has been established of simple, robust, repeatable sustainable improvement through transfer of knowledge and skills to our clients, and the establishment of simple, robust, repeatable management processes. Assetivity has been nominated for a variety of awards including State Finalist for the Telstra Business Awards for the 3rd year running, as well as being listed in the BRW Fast 100 for the fifth time and the SmartCompany Smart50 for the third time.

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Assetivity Pty Ltd

Assetivity is a hybrid Engineering and Management Consulting organisation assisting organisations to obtain maximum value from their capital and operational assets. Assetivity has extensive experience in the areas of asset management, strategic management, maintenance and reliability management, operations management and other disciplines and professions; and to promote practitioner participation in and enhance the asset management and maintenance engineering capabilities of asset management practitioners and organisations; to promote excellence in the practice of asset management and maintenance engineering; to promote practitioner participation in and contribution to activities of the Company; to facilitate linkages at national and international levels; to facilitate active participation from other disciplines and professions; and to encourage experienced and informed investment into the body of asset management knowledge.

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Bentley Systems Pty Ltd

Bentley Systems is a leader in full asset-life cycle management from design, construct, hand over, operations and maintenance. With over 2,000 employees in over 50 offices worldwide, annual revenues surpassing US$550 million and over $1 billion in research and development acquisitions. Bentley’s Asset Performance Management’s (APM) APM Cloud is recognized as the leader in the asset management industry. APM Cloud provides organizations with an open and flexible platform for managing assets, and its unique closed-loop workflow approach helps organizations transform operations to ensure business continuity and productivity throughout the asset lifecycle.

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AM Peak

AM Peak is the leading provider of asset management solutions and services in Australia. AM Peak provides strategic asset management solutions and services to businesses across a range of industries, including mining, manufacturing, energy, utilities, transport and infrastructure. AM Peak’s team of experienced asset management professionals is dedicated to helping clients achieve their business objectives through effective asset management and maintenance programs.

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Astellix Ltd

Astellix is a hybrid Engineering and Management Consulting organisation assisting organisations to obtain maximum value from the capital invested in their assets. Astellix has extensive experience in improving the asset performance and operational capability of organisations in asset-intensive industries, such as mining, manufacturing, energy, utilities, transport and infrastructure. Astellix brings a comprehensive set of Asset Management tools and services to every assignment. We can assist with Asset Management Strategy Development, Asset Management Planning, Asset Management Implementation and Asset Management Training and Audits. Assessed by the IAM. Astellix also offers a wide range of services in Operations Management, Asset Management and Supply Management, all of which are tailored to each unique situation. Our focus is on developing long-term sustainable improvement through transfer of knowledge and skills to our clients, and the establishment of simple, robust, repeatable management processes. Astellix has been engaged in improving the asset performance and operational capability of organisations in asset-intensive industries, such as mining, manufacturing, energy, utilities, transport and infrastructure. Astellix brings a comprehensive set of Asset Management tools and services to every assignment.

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Bentley Systems Pty Ltd

Bentley Systems is an operations, maintenance and construction services business, operating globally in the resources, energy, industrial, infrastructure, property and defence sectors. Bentley Systems works closely with its clients, helping them to achieve their business outcomes through optimising the sustainable performance of their assets. www.transfieldservices.com

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Lycophyton Asset Management

Lycophyton Asset Management Pty Ltd has its headquarters in Perth Western Australia with offices in Brisbane (Queensland) and Manila (Philippines). We are an engineering consultancy providing a range of Asset Management services to clients in the Petrochemical, Oil & Gas, Mining, Minerals Processing, Manufacturing and Marine sectors. Established in 1989, our company is recognised as a leader in the Asset Management field. We pride ourselves on providing practical solutions for our clients with significant experience in re-engineering existing systems for Brownfield operations as well as developing and implementing new systems for Greenfield developments.

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KE Technology Pty Ltd

KE Technology Pty Ltd has provided winning asset management solutions tailored to industry needs. Founded in 2000, KE has established itself as a leader in maintenance engineering and asset management services at all stages of the resource life-cycle. With offices in Perth, Brisbane and Singapore, and two further agents representing the company in the United States and Europe, KE's proven experience ensures its ability to offer expertise on an expanding global client base. Certified to the following standards: AS/NZS 4367:1999, ISO 9001:2008 Asset Management Services, in 2013 KE was awarded the prestigious Gold Asset Management Award from the Asset Management Council for the successful completion of Woodside’s N2 Production Readiness project. With eight integrated divisions, KE provides complete asset management services and support capability: strategic consulting; maintenance and reliability management; operations engineering support; operational readiness; advanced digital systems; commissioning services; governance & integrity management; supply chain management. KE is committed to providing clients with safe, reliable, fit-for-purpose asset management and engineering services. The company’s expertise is continually refined, ensuring it can provide leading edge services in line with the latest available enterprise asset management systems.

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I&ESYSTEMS

I&ESYSTEMS is a systems engineering for control, safety, SCADA, turbine machinery and power applications. They define operational requirements, design, configure, supply and commission these systems. They replace, retrofit and upgrade systems with minimum downtime and have performed many complex upgrades in hazardous operations during full production based on high integrity, error free designs developed using our System Information Modelling software DAD. Their view is that the highest quality and their record for accuracy, and adherence to schedule and budget, on many projects successfully completed around the world demonstrates this. Their DAD System Information Modelling tools provide an excellent representation of any physical system, where digital components, connections and functions are linked just like their physical counterparts. DAD’s impact on system design is ground-breaking, delivering a time and cost saving of greater than 60% when compared with any current methods, and continues to deliver accuracy and consistency for the lifetime of any connected system.

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IQA-AM

Institute of Quality Asset Management

Institute of Quality Asset Management

IQA-AM is a private registered Training Organisation, formerly known as the Asset Management Council provides Certification, Training, Conferences, a Body of Knowledge and the Global Forum of Maintenance and repair management services to its members and the ever-increasing global asset management community. The object of the Association is to promote, encourage and enhance the asset management and maintenance engineering capabilities of asset management practitioners and organisations; to promote excellence in the practice of asset management and maintenance engineering; to promote practitioner participation in and contribution to activities of the Company; to facilitate linkages at national and international levels; to facilitate active participation from other disciplines and professions; and to encourage experienced and informed investment into the body of asset management knowledge.

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Sponsors

Sponsors
Geomatic Technologies (GT) is a recognised leader in advanced mobile and spatial technologies and is an Australian leading provider of IT integrated solutions and services. GT’s solutions portfolio includes solutions and services for mobile workforce management, asset capture and inspection, web mapping, data validation and geocoding services, and solutions for data access, data management and data distribution. GT has a long and successful track record supporting asset management activities in sectors like government, transportation, water and power, telecommunications, insurance and real estate.

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Geomatic Technologies

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K2 Technology Pty Ltd

Award-winning asset management solutions tailored to industry needs. Founded in 2000, K2 has established itself as a leader in maintenance engineering and asset management services at all stages of the resource life-cycle. With offices in Perth, Brisbane and Singapore, and two further agents representing the company in the Asian market, K2's growing network ensures its ability to offer expertise to an expanding global client base. Certified to ISO 9001 as an Administration Services Standards, in 2013 K2 was awarded the Australian Geomatics Management Award from the Asset Management Council for the successful completion of Woodside's N2 Production Manifold Replacement. With eight integrated divisions, K2 provides complete asset management services and support across capability, strategic capture, business process and reliability management; operations engineering; sensor and surveillance; advanced surveying and mapping; advanced data systems; commissioning services; governance; integrity management; supply chain management. K2 is committed to providing clients with safe, reliable, fit-for-purpose asset management and engineering services. The company's expertise is continually refined, ensuring it can provide leading edge services in line with the latest available enterprise asset management systems.

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Capability Partners

Established in 1995 as Capability by Design, Capability Partners is a 100% Australian owned company that provides asset management and safety-related engineering services to clients with complex, high energy physical assets. Our core competency is the holistic understanding of risk and its application to asset management and safety, within a business framework. We have developed a unique set of software tools to make our processes repeatable, efficient and cost effective. Our approach achieves a demonstrable balance between cost, risk and asset performance – a cornerstone of the ISO 65000 suite of engineering frameworks. We partner with commercial and public sector organisations in industries including defence, oil and gas and utilities in order to inform, ‘safety of use’ and ‘fitness of purpose’ of their assets, through our Lifecycle. As acknowledged industry thought leaders, we bring an innovative approach to our work, providing effective and individually tailored solutions to complex asset management problems.

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I&E Systems

I&E Systems are systems engineers for the utilities industry. I&E Systems is a leading provider of solid state protection, SCADA, control, ICS, CMMS and data distribution. GT has a long and successful track record supporting asset management activities in sectors like government, transportation, water and power, telecommunications, insurance and real estate.

Contact: Marielle Watt

Laborde

Landgate is Western Australia’s primary source of land information and geographic data, providing services to Government, business and individuals rely on. Landgate provides Western Australians with easy access to location information including Property Details, Titles, Valuations, Property sales and reports. Mmaps, Aerial photography, Satellite imagery. As a Statutory Authority, Landgate maintains the State’s official register of land ownership and survey information and is responsible for valuing the State’s land and property for government interest. Landgate is at the centre of the State’s location information technology. In 2008 we launched the Shared Land Information Platform (SLIP) Enabler, an application that has revolutionised the way spatial information across government and business is provided to the community with easier access to it. It provides the infrastructure and services required to access Western Australia’s considerable land and geographic information resources. At Landgate we recognise that making the right decisions requires location information. We provide location information for optimal decision making, including government, business and the community.

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Jacqui.Corunna@landgate.wa.gov.au

Logsys Power Services

Logsys employs around 150 dedicated electrical industry professionals and specialises in all aspects of overhead and underground electrical installation and maintenance as well as Electrical and Structural Information Services. Logsys has good working relations with Global companies in the USA (Dow Chemical, Gillette and France (Soltec) which are global leaders in their specific fields. Our Services include, but are not limited to, design and installation of Concentrator Photovoltaic systems, utility wood pole restoration systems and pole-breaking assessments, Street Lighting installation and Maintenance including globe replacements, Electrical and Structural design services, Live line glove and barrier maintenance services, Transmission and Distribution asset inspections and construction services, metal pole inspections, HV & LV switchgear maintenance. Thermo graphic surveys and condition monitoring as well as Asset Management Plans.

Contact: Johan Jankovitz

johan@logsys.com.au

McBee Associates

Riva is Australia’s Advanced Asset Management Software. Solutions provide a platform for our clients to perform long-range asset management planning and decision making, by bringing together your organization’s data from various sources including, spatial, work management and financial systems. Riva allows for the incorporation of your organization’s current and past practices and integrating them with your corporate databases, work order systems and other applications to source the inventory and condition of assets. Our technology generates a lifecycle cost and risk profile for each asset, as well as a capital and maintenance strategy with prioritization. Capabilities. And, it all happens in real time, so your plan is always current and up to date for up to 150 years.

Contact: Mark Wellard

david.wiley@au.pwc.com

OMICS International

The core business of OMICS International is currently focusing on the Formation of reliability improvement methods which, are based on FCM principles but build on what you already have rather than start from scratch. The core of our business is known as Planned Maintenance Optimisation (PM02008). Over the past fifteen years, OMICS International and its licencees have guided implementation of reliability assurance using PM02008 on over 200 client sites in many countries, industries and countries.

Our training programs have been delivered to thousands of operators and technical people. We currently have a network of over a dozen licensee companies all over the world. We provide them to our clients to distribute, implement and train in our methods. If you would like to know more please visit our stand at the ICOMS conference.

Contact: Rob van Duijken

rob@OMICSinternational.com

PWC The Asset Partnership

The Asset Partnership is amongst Australia’s leading consulting organisations. We specialise in helping our clients make efficient and effective use of their investments in physical assets. We work with you to: Identify operational constraints and improve through: Optimising life cycle costs; Deliver outputs with reduced safety and operational risks Our highly experienced consultants have experience in many industries and sectors including Mining and Minerals Processing, Defence, Power Generation, Utilities, Aerospace, Food and Beverage and Transport.

Contact: David Wiley

david.wiley@au.pwc.com

SAP

SAP is as market leader in enterprise application software, SAP (NYSE: SAP) helps companies of all sizes and industries run better. Founded in 1972, SAP is the leading provider for “Systems, Applications and Products in Data Processing” (SAP). With a focus on innovation and growth as a true industry leader. Today, SAP has sales and development locations in 66 countries across four continents, SAP applications and services enable more than 100,000 customers worldwide to operate profitably, adapt continuously, and grow sustainably.

Contact: Ben Johnsen

ben.johnsen@sap.com

Teak Yew

As a Corporate Leader you strive to create value for your shareholders. You make the decisions that matter. We provide independent Strategy advice to support your decision making and generate long-term value. Our specialist expertise focuses on capital allocation. Our highly experienced consultants have experience in many industries and sectors including Mining and Minerals Processing, Defence, Power Generation, Utilities, Aerospace, Food and Beverage and Transport.

Contact: Monique Beadles

mbeadles@teakyew.com

The Online Workshop

The Online Workshop Pty Ltd is a new company that has been specifically created to be the vehicle for the development of a new generation Enterprise Asset Management software product called SmartAsset. While this company and product are new, they represent the culmination of a project that has been a decade in the making. KDR Creative Software Pty Ltd is the original author and owner of a highly successful computerized maintenance management software application called ICMOS International Maintenance and Facility Management System (IFMMS). SmartAsset is a new generation, comprehensive enterprise asset management application that enables asset owners to better manage and maintain their plant, equipment and facilities and save millions using NET SmartAsset not only provides rich
functionality, it extends the user interface to allow deployment options including both the traditional graphical user interface (GUI) and browser style interfaces that allows internet/intranet/wireless deployment including an application service provider option for those customers wishing to minimise their IT investment.

Contact: Shane Burquest
shane.burquest@theonlineworkshop.com

Transfield Services Pty Ltd

Transfield Services is an operations, maintenance and construction services business, operating globally in the resources, energy, industrial, infrastructure, property and defence sectors. They work closely with our clients, helping them to achieve their business outcomes through optimising the sustainable performance, integrity and output of their assets. www.transfieldservices.com

Contact: Nayyar Eshan
shsann@transfieldservices.com

Vitech Reliability

Vitech Reliability is an Australian-owned organisation established in 1995 providing product sales, application support and training for machine reliability and dynamic measurement technologies. We equip industry with reliability and measurement solutions in Australia and New Zealand. Vitech Reliability offers: Vibration monitoring, machine diagnostics and portable & fixed CM solutions for rotating plant, Electric motor analysis and infrared thermal imaging solutions, Machinery alignment and corrective technology and NDT inspection technologies and dynamic measurement solutions, to the following industry sectors; heavy industry, water and waste water, power generation, defence, manufacturing, pulp & paper, food industry, mining, oil & gas, Refining.

Contact: Emma Wright
emma@vitechreliability.com

VIZIYA Corporation

VIZIYA is the industry leader in bolt-on software products that enhance ERP-based asset maintenance systems. VIZIYA’s proprietary WorkAlign™ Product Suite delivers seamless integration into existing Enterprise Asset Management (EAM) systems and is uniquely applicable to any existing ERP system. Our products work as bolt-on modules to existing maintenance software - they’re fully functional, fully extending the capabilities of your system. Opposed to being a standalone application, we leverage your ERP system’s APIs so you don’t need a separate database or integration bridge. Your data stays where it belongs – in your ERP system’s database. So, whether you’re still using your asset management module, in the middle of implementation, or still evaluating its potential, VIZIYA can meet your needs and give you the tools to effectively manage your business. With over 47,000 users at 710 sites from Fortune 1000 companies, VIZIYA is the industry-standard for EAM systems worldwide.

Contact: Vikesh Dayaram
vikesh.dayaram@viziya.com
Running concurrently so delegates can only enrol in one workshop or the Site Visit Tour 8.30am - 4.30pm

**WORKSHOPS & SITE VISITS**

**W1 Creative Technique to Evolve Condition Based Maintenance Strategies**

**SAP**

Traditionally we have solved problems by overlapping what is viable from a business sense with what is technically feasible. Design Thinking is an approach to solving problems that starts with what is desirable from a people perspective. Design Thinking is generally considered the ability to combine empathy for the context of a problem, creativity in the generation of insights and solutions, and rationality to analyse and fit solutions to the context.

The intent of this workshop is to combine the collective ideas of the workshop participants and apply a Design Thinking approach to Condition Based Maintenance. The outcome will be a comprehensive approach to real time monitoring and analysis of condition based data in order to maximise equipment uptime and operational efficiency.

**W2 Asset Management Fundamentals**

**Ernst Krauss, AM Council**

This one-day training course helps participants understand the fundamentals of asset management and how those fundamentals can provide benefits to an organisation.

Course Objectives

- Define asset management
- Identify the principles that underpin asset management
- Identify available asset management tools and techniques applicable to an organisation
- Identify opportunities to apply these learnings to improve individual and organisational performance

To recognise and quantify your learning, there is an online exam initiated on the day of the course.

**W3 Results Oriented Reliability and Maintenance**

**Andrew Pringle, Managing Director and Senior Consultant, IDCON Australasia**

This one-day workshop is designed to help organisations to accelerate their reliability and maintenance improvement initiatives. The basic principles of maintenance remain the same no matter what industry you are working in. Many organisations know what to do to achieve world-class performance, but only the best actually do it.

The workshop will enable participant to learn;

- ‘What good reliability and maintenance looks like’ and ‘how to get there’
- What exactly should you focus on in order to develop and execute world-class reliability and maintenance management practices
- How to visualise and connect maintenance and reliability with the results of the whole organisation
- How to sell the maintenance initiatives to top management

**S V Day of Site Visits**

This one-day tour will take in the following industry sites:

**Perth Desalination Plant**

Completed in late 2006 the plant produces 45 billion litres of fresh drinking water a year – around 17% of Perth’s water supply.

**Australian Marine Complex Common User Facility (AMC CUF)**

WA’s first floating dock.

**WesternPower Operation Centre**

The Network Operations and Control Centre (NOCC) forms part of the System Management Division and manages the operation of the distribution network 24 hours a day, 7 days a week.
Registering yourself?

a. Register online, amcouncil.com.au/conference
b. Return the registration form by email/fax with your payment as indicated on the form

Please note: Only individual participants can register themselves online.
All prices include GST

Registering Someone Else?

Please complete a registration form for each individual you are registering and return the form/s by email/fax as indicated on the form.

When completing the form:
• Please type or use BLOCK CAPITALS in ballpoint pen
• Cheques and bank drafts are to be made payable to the Asset Management Council in Australian dollars
• Retain a copy of this form for your future reference

DELEGATE INFORMATION

Title: First Name: Family Name:
Position:
Company Name:
Postal Address:

  Postcode: Country:

Telephone: Fax:

Email of participant:

Special dietary requirements: Please detail

Personal detail on delegate list: Name, Organisation and Email Name and Organisation

☐ Please do not include me

PAYMENT DETAILS

☐ Payment by EFT/cheque/bank draft/purchase order

EFT Info: BSB: 633-000  Account Number: 139147284  Account Name: Asset Management Council Ltd
Swift code: bendau3B
Please enclose your cheque, draft or purchase order made out in Australian dollars to the Asset Management Council Ltd

☐ Payment by credit card Please debit my ☐ Visa ☐ MasterCard ☐ Amex ☐ Diners

Cardholder Info:
Cardholder Name:
Card Number: Expiry Date: / CCV:

Cardholder Signature: Date:

Email for Tax Invoice/Receipts (if different to above):

SUMMARY OF PAYMENT AND REGISTRATION DETAILS (Refer to prices overleaf)

Registration Type – If indiv. Day/s, please specify: $ 
Workshop or Site Visits – Please specify: ☐ W1 ☐ W2 ☐ W3 ☐ SV $ 
Payment for accompanying spouse or partner: $ 
Payment for additional USBs of proceedings: $ 
Payment for additional Social Function Tickets: $ 

TOTAL: $
## Registration Prices

**Full Conference Attendance**
Includes attendance at all sessions on Tuesday, Wednesday & Thursday, lunches and refreshments, Practitioner Forum Monday, a USB of proceedings, Welcome Function, entrance to the Exhibition, YAMP Networking Evening, Annual Dinner and Farewell Drinks.

<table>
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<tr>
<th></th>
<th>Non-member</th>
<th>Member</th>
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<tr>
<td>Full Conference</td>
<td>$2560</td>
<td>$2310</td>
<td>$900 (NM)</td>
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<tr>
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<td>$2410</td>
<td>$2150</td>
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<tr>
<td>Presenter</td>
<td>$2050</td>
<td>$1800</td>
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**Day Registration**
Includes attendance at all sessions, lunch and refreshment breaks on the day of registration and entrance to the Exhibition. Please specify which day/s in the payment summary overleaf.

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<td>One day only</td>
<td>$900</td>
<td>$770</td>
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<tr>
<td>Three days</td>
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**Workshops**
Please indicate which workshop you will be attending in the payment summary overleaf.

- **W1.** Creative Technique to Evolve Condition Based Maintenance Strategies
- **W2.** Asset Management Fundamentals
- **W3.** Results Oriented Reliability & Maintenance

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**Site Visits (SV)**
Perth Desalination Plant, Australian Marine Complex Common User Facility and WesternPower Operations Centre

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<tr>
<td>SV</td>
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**Three-day Partner Program**
Three-day tour includes Welcome Function, YAMP Networking Evening, Annual Dinner and Farewell Drinks. Individual days can be bought (See below)

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<tr>
<td>Partner Program</td>
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**Partner name for registration badge:**

**Additional Tickets**
Social function tickets are included in the Full Conference Registration fee and the three-day Partner Program fee, as detailed above.

- Welcome Function (Mon)
  - $80 per ticket
- YAMP Networking (Tue)
  - $35 per ticket
- Annual Dinner & Awards (Wed)
  - $190 per ticket
- Farewell Function (Thu)
  - $50 per ticket
- Partner Program (per day)
  - $200 per ticket

**Additional USB**
$88 each

Please summarise your choices and payments overleaf.

*proof of student identity will be required upon registration

Please return your completed form via:

**Email:** AMPEAK@amcouncil.com.au
**Fax:** +61 (0)3 98192615
**Mail:** Asset Management Council, PO Box 2249, Hawthorn VIC 3122 Australia

**Early bird prices apply until April 30th.**