



ICOMS ASSET MANAGEMENT CONFERENCE, ADELAIDE 2010

21-25 JUNE 2010, UNIVERSITY OF ADELAIDE

ICOMS Asset Management Conference is the Asset Management Council's annual technical symposium. It commenced in 1994 as a maintenance conference, but now encompasses all aspects of engineering asset management, such as AM principles, processes, configuration management, continuous improvement, demand management, integrated support, operations and maintenance and systems engineering. Both technical and managerial aspects of asset management are covered.

See following pages for more ICOMS10 information

Partner Program

- Welcome Function: (Monday night)
- Gala Dinner: (Wednesday night)
- Tours: (Tuesday, Wednesday & Thursday)
- Farewell Cocktail Function: (Thursday pm)

TOURS

Tuesday 22nd June 2010 Wine Tour of The Barossa Valley

A personalised exclusive tour with a specialist wine guide

Time: 9.00am – 5.00pm

The Barossa Valley is Australia's best known and most historic wine region. The region produces some of the country's finest wines, with names such as Rockford, Penfolds, Seppelt, Yalumba, and Peter Lehmann all based in the Barossa. Barossa winemakers craft brilliant Shiraz and are the custodians of some of the oldest Shiraz vines in the world. Other varieties grown include Cabernet Sauvignon, Grenache, Semillon, Riesling and Viognier. Settled mainly by immigrant Lutherans, the Barossa is passionate about celebrating its heritage and traditions. Its culinary traditions are obvious at the numerous butchers, bakeries, restaurants, farmers' market and wineries, while nineteenth century European influences are reflected in the churches, shops and homes in each of the pretty towns.

Wednesday 23rd June 2010 An Introduction to Aboriginal Culture

Time: 9.00am – 1.00pm

In the company of an Aboriginal guide, learn about social history of early Aboriginal life, taste native bush food, explore cultural environments. Finally be introduced to the many facets of Aboriginal art.

Thursday 22nd June 2010 An Interlude in the Adelaide Hills

Time: 9.30am – 4.30pm

Colonel Light, founder of Adelaide, once described the Mount Lofty Ranges that cradle Adelaide, as "the Enchanted Hills". Small villages, orchards, vineyards, and beautiful gardens are all to be found here.

Social Program

Monday 21 June 5.00pm

Exhibition Opening and Welcome Cocktail Reception. Bonython Hall, University of Adelaide Sponsored by The Asset Partnership

Wednesday 23 June 6.30pm

Awards Ceremony and Annual Dinner Adelaide Hilton

Thursday 24 June

Farewell drinks
The Majestic Roof Garden

(see map page 32)

Dress

Welcome Function

Neat casual attire is recommended.

Daytime

Delegates: Neat business attire

Partners: Comfortable smart casual attire.

Annual Dinner: Smart business attire.

Registration Desk Hours

Mon 21	Registration Opens	2.00pm
	Welcome Cocktails	5:00pm
Tues 22	Opening Session	9:00am
Wed 23	Sessions start	9:00am
	Awards Dinner	6:30pm
Thu 24	Sessions start	9:15am
	Conference closes	5:00pm
Fri 25	Courses	9:00am – 4:30pm





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ICOMS TECHNICAL TEAM

1. Joanna Sikorska, ICOMS Technical Chair

Joanna has a mechanical engineering degree and PhD from the University of WA. She has 15 years experience in asset management as a practitioner, consultant and lecturer. Jo currently works in an engineering R&D consultancy called CASWA, which develops novel software and hardware solutions for asset management applications. Her areas of expertise include asset health diagnostics and prognostics, acoustic emission monitoring of rotating machinery, data quality management and reliability engineering. Jo is a regular speaker at ICOMS and has also published widely in a number of international peer reviewed journals. She is also an Adjunct Senior Lecturer at UWA's School of Engineering.

2. Deryk Anderson, Technical Team

Deryk currently works as an operations consultant, trainer and mentor to Australian and overseas organisations. He has had over 24 years experience in the management of industrial assets as a practitioner, manager and consultant across a variety of industries including mining, manufacturing, food processing and utilities. Deryk has been an active member of the asset management and maintenance community holding positions as the Queensland Chapter Chair of MESA and an Executive Member of the Asset Management Council. He is a founding member of the committee to establish the Asset Management Body of Knowledge.

3. Peter Crosby, Technical Team

Peter has worked and trained continuously in the field of naval engineering for the past 31 years, including engineering management and project engineering positions relating to ships and submarines. He served in the Royal New Zealand Navy for 24 years and retired as Director of Naval Engineering in May 2003 to join ASC. Peter has honours degrees in Mechanical Engineering and Naval Architecture, a postgraduate Diploma of Business and is a Graduate of the Royal Australian Navy Staff College. He is a Chartered Engineer and a Fellow of the Royal Institution of Naval Architects.

4. Terry Howard, Technical Team

Terry is the Manager Performance and Reliability for RailCorp in NSW and leads a team that analyses the current performance of the network and sets the strategic direction for improvement. He is a member of the Sydney Chapter Committee, and has an electrical engineering background with post graduate studies in Asset Management and Systems Engineering. Terry has extensive rail industry experience in practical application of asset management principles and is a lecturer for RailCorp's and AM Councils Asset Management courses.

5. Steve Berquist, Technical Team

Steve is a member of the Brisbane chapter of the Asset Management Council and has over 20 years experience in the field of physical asset management, maintenance management and asset performance improvement for heavy industrial plants through the application of best practices and technology. His specialty is the application of predictive maintenance and condition monitoring techniques to improve the reliability of plant and equipment. His experience includes the power generation, materials handling, mineral processing and mining industries. He is currently manager of Performance Technology for Fluor's Operations and Maintenance business based in Brisbane, Australia.

6. Melinda Hodkiewicz, Technical Team

Melinda is an Associate Professor in the Engineering Faculty at the University of Western Australia, and leads the UWA Asset Management postgraduate program. She has a background in operations and maintenance primarily in the mining industry in the US and Australia and a PhD in condition and performance monitoring from UWA. Melinda was recently nominated by Standards Australia to lead the development of a project proposal on behalf of Australian asset management stakeholders for participation in the ISO committee for asset management.



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ICOMS SPEAKERS

Asset Management "We are all in this together"

John Hardwick

Opening & Keynote Speaker (1)
Chairman,
Asset Management Council Executive
Manager,
Maintenance and Replacement Planning,
EnergyAustralia

Paul Agar

Opening Speaker (2)
Group General Manager
Asset Management and Implementation
Transfield Services

Is Asset Management a profession?

Penny Burns

Keynote Speaker (3)
Principal Director, AMQ International
Editor of "Strategic Asset Management"

Adding the Spatial Dimension

Jim Gaha

Keynote Speaker (4)
Executive General Manager,
Infrastructure Services, Transfield Services

Steps to developing an effective integrated corrosion management program to minimise costs & extend life

Rolf Gubner

Keynote Speaker (5)
Director,
Western Australian Corrosion Research Group,
Curtin University of Technology

Urban water industry – complex operating environment, adaptive asset management

Anne Howe

Keynote Speaker (6)
Chief Executive,
South Australian Water Corporation

Fighting the maintenance crisis

Joel Leonard

Keynote Speaker (7)
'The Maintenance Evangelist' of SkillTV.net, USA

The journey to predictable reliability through the enhancement of a proactive maintenance organisation using people development and modern maintenance techniques

Keith Mottershead

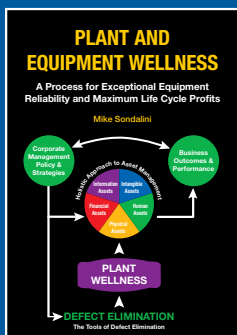
Keynote Speaker (8)
Manufacturing Services and
Facilities Operations Manager,
Rolls Royce, UK

SPECIAL OFFER FOR ICOMS ATTENDEES

PLANT AND EQUIPMENT WELLNESS

Mike Sondalini

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EA BOOKS

ICOMS ASSET MANAGEMENT CONFERENCE

Program



Monday 21st JUNE 2010

2.00pm	Registration Opens
2.00pm	Forum on ISO Standard, sponsored by Transfield Services Chair: Patrick Quain
5.00pm	Welcome Function & Exhibition Opening Sponsored by The Asset Partnership

TUESDAY 22nd JUNE 2010

9.00am	Official Opening John Hardwick, National Chair, Asset Management Council Ltd, Paul Agar, Group General Manager, Transfield Services
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9.15am	Keynote Addresses Chair: John Hardwick <ul style="list-style-type: none"> • Urban Water Industry Complex Operating Environment, Adaptive Asset Management • Fighting The Maintenance Crisis 	Anne Howe, SA Water Australia (<i>Précis 01</i>) Joel Leonard, SKILLTV.net USA (<i>Précis 02</i>)
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10.30am	MORNING TEA Sponsored by Monash University
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11.00am	Keynote Address Chair: Joanna Sikorska <ul style="list-style-type: none"> • Is Asset Management A Profession? 	Penny Burns, AMQ International Australia (<i>Précis 03</i>)
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11.30am	Panel Discussion: Is strategic asset management a concept or a reality?
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12.45pm	LUNCH Sponsored by EnergyAustralia
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	Standards & Data Chair: Patrick Quain	Human Dimensions Chair: Ernst Krauss	Asset Management Implementation Chair: Stewart Lawrence
2.00pm	Using Web 2.0 Tools To Facilitate Knowledge Transfer In Complex Organisational Environments - A Primer Glen Murphy, CIEAM Australia (<i>Paper 028</i>)	Mixing Oil And Water - Developing Strong Ties Between Operations And Maintenance Departments Ivan Winter, Ingenia Pty Ltd Australia (<i>Précis 053</i>)	State Water's Asset Management Experience Glen MacKintosh, State Water Corporation Australia (<i>Paper 017</i>)

2.30pm	Does An Asset Management Standard Already Exist? Jim Kennedy, Interlogis Consulting Australia (<i>Paper 039</i>)	Blind Man's Bluff: Understanding The Need For Improved Information Sharing Between Organisations Paul Kril, EnergyAustralia, Australia (<i>Précis 058</i>)	Asset Management And The Capability To Get There Glenn Hopkins, Logica Australia (<i>Paper 045</i>)
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3.00pm	Progress In Applying PAS55 In Australia Stephen Lemon, AMCL Pty Ltd Australia (<i>Précis 051</i>)	The Role Of Trust In Inter-Project Knowledge Transfer Anna Wiewiora, QUT Australia (<i>Paper 036</i>)	Asset Management Implementation At Leading Oil Refinery In Asia Veera Anantaratikun, SKF Asia Pacific Singapore (<i>Paper 021</i>)
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3.30pm	AFTERNOON TEA
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	Roundtable: Implementing CMMS Chair: Sandy Dunn	Lifecycle Modelling Chair: Danny Azavedo	Asset Management Implementation Chair: TBA
4.00pm	Users outlining key aspects of their experiences to date in implementing CMMS. Organisations represented include: EnergyAustralia – Murray Chandler Woodside Energy Ltd – Ernst Krauss	Extracting The Value From Life Cycle Modelling Stephen Inouye, Rylson Group Australia (<i>Paper 013</i>)	How To Improve Profitability Of Metal Mills Through Asset Management Services Liang Dong, SKF China Ltd China (<i>Paper 020</i>)

4.30pm		Forecasting Renewal Expenditure For Council Buildings Dhirendra Kumar, Moreland City Council Australia (<i>Paper 049</i>)	Leading Performance Management Solutions For The Global Utilities Sector Tony Saker, UMS Group Asia Pacific Australia (<i>Paper 046</i>)
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5.00pm	Meet the Students Sponsored by University of Adelaide
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Wednesday 23rd JUNE 2010

9.00am	Keynote Addresses Chair: Gary Winsor <ul style="list-style-type: none"> • Steps to Developing an Effective Integrated Corrosion Management Program to Minimise Costs & Extend Life • Asset Management "We Are All In This Together" 	R Gubner, Curtin University of Technology, Australia (<i>Précis 04</i>) John Hardwick, EnergyAustralia Australia (<i>Précis 05</i>)
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10.30am	MORNING TEA
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11.00am	Panel Discussion: Is corrosion and structural degradation a major subject of denial in asset management today?
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12.30pm	LUNCH Sponsored by EnergyAustralia
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Wednesday 23rd JUNE 2010 continued

	RAM Modelling Chair: Joseph Mathew	Asset Management Chair: David Spiteri	Round Table Discussion on Standards for Life Cycle Data Management Chair: Peter Kohler
2.00pm	Asset Management And Availability Modelling Khalee Field, Santos Ltd. Australia <i>(Paper 015)</i>	Maximising The Remaining Life Of Cranes Joanna Sikorska, CASWA, WA Australia <i>(Paper 010)</i>	ISO 15926 addresses several information management challenges for the owners and operators of capital intensive plants. When a plant is contracted to be designed and built, ISO 15926 should form part of the requirements for the handover data deliverables. The result should include: <ul style="list-style-type: none"> • Rapid, low-cost verification of the fulfilment of the contract terms. • Reduced cost of bringing handover data into the enterprise systems.
2.30pm	Computer Modeling Of Maintenance Policy Change In Defence Glen Kerr, ASC Pty Ltd Australia <i>(Paper 030)</i>	An Analysis Of Rolling Mill Data To Identify Optimum Planned Downtime Strategies George Wood, Australia <i>(Précis 026)</i>	
3.00pm	Modelling Tools To Predict The Condition Of Underground Sewer Assets Robert May, United Water International Pty Ltd Australia <i>(Paper 035)</i>	Use Of AM Fundamentals And Techniques To Optimise A Manufactured Product. Peter Oliver, Fluid Conveyancing Australia <i>(Précis 052)</i>	
3.30pm	AFTERNOON TEA Sponsored by Airservices Australia		
	Advanced Modelling Chair: Lin Ma	Maintenance Management Chair: Byron Martin	Technology Chair: Peter Oliver
4.00pm	An Inspection Optimization Model For A System Subject To Hidden Failures Sharareh Taghipour, University of Toronto Canada <i>(Paper 044)</i>	Steady State Maintenance In Rail David Spiteri, RailCorp Australia <i>(Précis 034)</i>	How To Improve Profitability Of Mobile Geographical Information Systems Implementation For Water Infrastructure Shane Harrison, Veolia Water Australia <i>(Précis 031)</i>
4.30pm	Throughput Centered Prioritization In The Presence Of Buffers Rodrigo Pascual, Universidad Catolica de Chile Chile <i>(Paper 050)</i>	Reconfiguring a Primavera Database System for Maintenance Projects Gerard Gan, Mulgrave Engineers Australia <i>(Paper 029)</i>	Driving Best Practice AM-IT Management - International Network Asset Management Information Technology Services Consortium (NAMITS) Tony Saker, UMS Group Asia Pacific Australia <i>(Paper 047)</i>
6.30pm	AWARDS CEREMONY & ANNUAL DINNER		

Thursday 24th JUNE 2010

9.15am	Keynote Address Chair: Andrew Morgan • Adding The Spatial Dimension Jim Gaha, Transfield Services Australia <i>(Précis 06)</i>		
9.45am	Panel Discussion: Do acquisition projects really include long term asset management implications in their decision making?		
11.00am	MORNING TEA Sponsored by University of Wollongong		
	Information Utilisation Chair: Guan Peh	Risk Analysis and Management Chair: Jim Kennedy	Implementation of Good Practice Chair: Geoff Cannon
11.30am	The Application of Expert Knowledge to Implement An Intelligent Maintenance System Edgar Amaya, University of Brasilia Brazil <i>(Paper 024)</i>	Risk Assessment Of Wastewater Networks Infrastructure In Adelaide Using GIS/Infonet Kevin Spoehr, United Water Australia <i>(Paper 011)</i>	Highlights from organizations that have improved their asset management strategy and implementation. <i>Speakers include:</i> <ul style="list-style-type: none"> • Glen Pascoe, United Water • Gary Winsor, EnergyAustralia • Brad Thompson, Airservices Australia • Stuart Gibson, Transfield Services
12.00pm	Uniform Asset Coding Structures Improve Asset Management Capability Ernst Krauss, Woodside Energy Australia <i>(Précis 056)</i>	Predicting The Impact Of Asset Performance On The Punctuality Of Services In A Suburban Railway Terry Howard, Railcorp NSW <i>(Précis 033)</i>	
12.30pm	LUNCH Sponsored by EnergyAustralia		
1.30pm	Asset Management Council Ltd Annual General Meeting		
	Optimising Maintenance Chair: Terry Howard	Asset Management Models Chair: Deryk Anderson	AM Implementation Chair: Brad Thompson
2.00pm	Defect Elimination Management In An Operating Environment Graham Elliott, Santos Australia <i>(Paper 048)</i>	Round Table Discussion on How to Improve AM Models Hosted by Asset Management Council Technical Development Team <ul style="list-style-type: none"> • Capability Model • Process Models • Maturity Model 	Reliability / Availability Modelling at End of Asset Life Ernst Krauss, Woodside Energy Australia <i>(Précis 057)</i>
2.30pm	SF6 Emission Reduction From SF6 Equipment, A Life Cycle Approach Zahra Jabiri, Western Power Australia <i>(Paper 041)</i>		Quantitative Risk Based Replacement Of Critical Water Mains David Zhang, Sydney Water Corporation Australia <i>(Précis 054)</i>
3.00pm	From Paper Mountain To Electronic Dashboard Peter Litchfield, Mighty River Power New Zealand <i>(Précis 022)</i>		Develop Integrated Asset Management Decision Support Practice Lin Ma, CRC for Integrated Engineering Asset Management School Australia <i>(Précis 055)</i>
3.30pm	Closing Address Chair: Kieran Skelton <ul style="list-style-type: none"> • Multi-Refineries Turnaround Optimisation at Petrobras Athayde Ribeiro, ABRAMAN, Brazil • The Journey To Predictable Reliability Through The Enhancement Of A Proactive Maintenance Organisation Using People Development And Modern Maintenance Techniques Keith Mottershead, Rolls Royce Plc UK <i>(Précis 07)</i> 		
4.30pm	FAREWELL DRINKS		

Friday 25th JUNE 2010

8.30am	Asset Management Fundamentals	Risk and Reliability
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Urban Water Industry – Complex Operating Environment, Adaptive Asset Management

A Howe, Summary 01

SA Water is typical of the large water utilities that make up much of the Australian urban water industry. It is fully owned by the South Australian Government and provides water and wastewater services to over 600,000 customers. Publicly owned water utilities operate in a complex environment that demands efficient operation, a high level of public accountability, leading edge environmental solutions and ownership of long life infrastructure assets. The complexity has impacted directly on the industry's evolution of asset management. Philosophically, it has adopted a broad, strategic approach, which integrates with other typical high level planning processes. Practically, the industry has developed a high level of asset management collaboration between utilities that operate under different regulatory jurisdictions. SA Water's asset management journey has included having to deliver large, capital intensive solutions to particular problems (such as prolonged drought) while also ensuring that ageing infrastructure is not compromised. Its asset management framework has provided a ready means of consolidating all asset related risk and presenting required forward management plans. As a typical, asset intensive organisation, SA Water employs a variety of delivery mechanisms across both capital project delivery, and operations and maintenance. It has in place various contractual arrangements which involve a shared responsibility for asset management.

Fighting The Maintenance Crisis

J Leonard, Summary 02

More and more companies are feeling the symptoms of the maintenance crisis. Deferred maintenance is reaching chronic levels as current equipment continues to age, while sophisticated, new equipment needs more care, attention and custom configuration. Companies are struggling to find internal talent that has the skills and education to replace the retiring baby boomers. Attend this session to discover some proven solutions to this crisis, discuss innovative approaches to thrive in this adverse business environment. The average age of hundreds of thousands of maintenance people across the globe is 48. Many of the boomer generation have started to retire, leaving empty maintenance positions unfilled. Companies are facing a challenge in finding qualified workers to fill these vacancies. With no one to fix broken pipes, frayed wires, aging equipment, and few who understand how to support modern automation technologies, nations are finding themselves in what Joel Leonard has coined, "The Maintenance Crisis."

Is Asset Management A Profession?

P Burns, Summary 03

Whenever I ask asset managers "Are you a professional?", they will always say "Yes!", but a professional what? A professional engineer, economist or accountant, or a professional asset manager? In this paper I look at the question of whether it is possible for a multi-disciplinary field such as asset management to be a profession. Which leads on to an even more interesting question, do we really want it to be? And, if not a profession, then what? Is it a trade, albeit a skilled trade, is it a field of application, perhaps it is even a vocation. Why is this question important? Well, unless we know what we are, how do we know the most effective way to develop? How do we know the best way to promote? How can we be sure about the methods we choose to educate? I explore these questions by comparing asset management to well established professions such as journalism, education and medicine and find that there is much to be learnt from each of these that can improve our understanding of the nature of asset management and make us more effective asset managers.

Steps To Developing An Effective Integrated Corrosion Management Program To Minimise Costs & Extend Life

R Gubner, Summary 04

An integrated corrosion management program should be part of the overall asset management and preservation program and should not be treated as/in a separate system. Integrity of assets is a characteristic of sound and safe performance for which it was designed. Other subsets of the overall integrity management program include, e.g. mechanical damage and operating stress. This presentation will outline steps for developing an effective integrated corrosion management program with the aim to minimise costs and to extend life whilst reducing the risk for failure. Cost implications of inadequate corrosion control include both direct and indirect costs, which are correlated. For example, inadequate coating maintenance (direct cost) will lead to increased maintenance and repair costs later (indirect costs), which often outweigh the initial costs of simply maintaining the adequate condition of the coatings. The implementation of an Integrated Corrosion Management Program, that result in the reduction/elimination of corrosion related damage/deterioration of assets, will not only assist in compliance with regulatory requirements but also has a direct effect on the assets overall economic performance

Asset Management – We are all in this together

John Hardwick, Summary 05

The journey towards excellence in Asset Management can often be a confusing one – Which way do I go? How far do I go? What tools are there to help me? The Asset Management Council (AM Council) is participating in a range of initiatives, both locally and internationally, with the aim of creating and sustaining knowledge within the Asset Management community of Australia, and harmonising this knowledge on a global scale. Internationally, the AM Council is represented on the Global Forum on Maintenance & Asset Management (GFMAM), which draws experts together from around the

world to share advancements, knowledge and standards. Its purpose is to provide global collaboration and alignment regarding maintenance and asset management. The AM Council are working with the Institute of Asset Management UK (IAM) on the development of an Asset Management Landscape which includes a conceptual model, a defined list of Asset Management subjects and an Asset Management Maturity Scale. An international accord is also under development in order to provide international recognition of qualifications in Asset Management. Progress is also being made into the development of an ISO Standard on Asset Management. Input for each of these initiatives is driven from the AM Council working groups under the Technical Development Team. So, what does that mean to you? It is important to understand how all of this fits together, where your organisation is in the Asset Management journey and what tools, techniques and initiatives can help you and your organisation take the next steps.

Adding The Spatial Dimension

J Gaha, Summary 06

This paper describes the journey Transfield Services has embarked upon to enhance our Integrated Asset Management Processes & Systems with spatial data. This journey started with an early identification of benefits from being able to integrate Asset Management processes with spatial data. All system design has been driven through business defined use cases, this approach has ensured all scenarios are considered and covered thoroughly throughout the project lifecycle. The journey has expanded to include spatial integration for the work crews, improving process efficiency and accuracy of data. As a service provider, transparency for clients is essential, our systems and processes have incorporated this, adding the ability to share spatial data through web services and client portals. Ultimately, this has created a product which differentiates Transfield Services, based on an integrated approach where we combine financial, asset, condition and spatial data, the sum creating greater value than the component parts. The key benefits have been empowerment of field users; increased productivity; configuration management; powerful analytics to support strategic asset management decisions and improved client visibility. The current focus has been in Infrastructure, we now plan to leverage the standard processes and innovation across our wider organisation. This paper shows where Transfield Services is now in its journey and where it aims to go on the continuing journey.

The Journey To Predictable Reliability Through The Enhancement Of A Proactive Maintenance Organisation Using People Development And Modern Maintenance Techniques

K Mottershead, Summary 7

The maintenance organisation had for many years been seen as no more than a necessary evil and as such had received no development or real structure, having had much success developing an existing maintenance organisation by introducing a new structure, working patterns, developing

the skills of the staff and raising the profile, I was "invited" to help. Following a brief company overview and putting the "project" into context, focus is given to the issues and challenges faced from years of "culture" and strong demarcation lines and the path taken to the current state and the future direction, the research and review methods for benchmarking, best practice and general information gathering will be discussed.

Maximising The Remaining Life Of Cranes

J Sikorska & P Kelly, Paper 10

The 10-year design life of most crane hoists (and 25-year life of structures) presupposes a pattern of lifting that is specified at design time. When actual load conditions, such as the number and duration of lifts, differ from the original estimates, crane life can be reduced substantially, even when its rated capacity has not been exceeded. Furthermore, the crane owner/maintainer may be unaware of this change. This paper will: (a) demonstrate how remaining design life of cranes and hoists can be determined using AS1418 (and its referenced standards), (b) demonstrate the effect of load spectra on crane life, (c) discuss the benefits of logging crane utilisation in real time and review monitoring options currently available, (d) illustrate how this data can be used to maximise the safe life of the crane, and finally (e) discuss how poor crane operation (jogging) can dramatically reduce available crane life.

Risk Assessment Of Wastewater Networks Infrastructure In Adelaide Using GIS/Infonet

N Mahoney K Spoehr & R May, Paper 11

The wastewater collection network in metropolitan Adelaide consists of a large number of assets distributed over a wide geographic area. This poses significant challenges in both conducting and prioritising asset management activities for these assets, including maintenance, rehabilitation, condition assessment and replacement. United Water has met these challenges in a cost-effective manner by developing prioritisation models utilising the functionality of GIS and InfoNet. The wastewater collection system in Adelaide includes over 80,000 wastewater access chambers, termed 'manholes', and 900 sewer vent stacks, commonly known as 'educt vents'. To conduct condition assessments for every manhole and educt vent in wastewater networks was not a financially viable option, and would not effectively manage risk. It was therefore decided to develop theoretical prioritisation models for the manholes and educt vents, to ensure that the assets with the highest risk of failure were identified for targeted condition assessment. Expert models were developed using GIS and InfoNet software packages after an extensive review of available techniques and programs. The models were used to identify the assets, which would theoretically be in the worst condition. Results of the model predictions have been encouraging, indicating a good correlation between theoretical condition ratings and known problem areas. This work has highlighted the importance of GIS and InfoNet software packages as powerful asset management decision-making tools.

Extracting The Value From Life Cycle Modelling

R Johnson, Paper 13

The theory of Life Cycle Modeling has been available for over 50 years and whilst it is a complex question to answer in its own rite the more difficult question is 'what do I do with the model once I have it?' Whilst the theory of Life Cycle Modeling has been around for many years the truth is only very few have attempted to apply this theory in real life asset management applications. The reasons for this are many and varied, however, the underlying theme more often than not, is not being able to understand what benefits are derived from having the information available. It is not a process for the faint hearted. There is considerable investment required to collate the necessary information and conduct the required analysis to build representative models. If the investment is large and the return is unknown, it is easy to understand why asset managers are reticent to commit to the process. The technical detail of how Life Cycle Models are developed is a subject of its own. This technical detail is not covered here. In this paper we will seek to identify where the value comes from when you embark down the path of developing Life Cycle Models for your assets and how that value is extracted to deliver a real return to your business. Only by understanding the value to be gained will we be in a position to commit to the investment.

Asset Management And Availability Modelling

K Field & M Chadderton, Paper 15

Santos, with the assistance of Shell Global Solutions, has undertaken an overhaul of its Reliability and Maintenance Management System for its Cooper Basin Assets to improve equipment performance and reduce costs. This initiative includes modelling equipment availability and capacity through the usage of Availability Assurance and Reliability Modelling software. A major obstacle encountered was receiving management support and recognition of the merits of availability modelling. Upon receiving endorsement, availability and capacity modelling of the CO2 Trains in the Moomba Gas Processing Facility has highlighted key train specific vulnerabilities within this system. Subsequently, this has demonstrated past reliability projects may not have addressed the true causes of downtime. Availability assurance has ensured a movement away from a subjective and reactive approach to reliability to one based on failure history and equipment criticality. Consequently, this paper outlines how availability assurance has been successfully used to move from a system of deferred production between upstream and downstream assets, to a holistic business approach whereby effective production (based on equipment capacity and availability) is the key parameter of success.

State Water's Asset Management Experience

G Mackintosh, Paper 17

State Water is NSW's rural bulk water delivery corporation, annually delivering more than 5,500GL of water to regional NSW on average, along 7,000km of river. The storage

and delivery of water is entirely dependent on its major infrastructure assets, which have a current replacement value of around \$2.9 billion. We manage and operate 20 dams and more than 280 weirs and regulators to deliver water for town water supplies, industry, irrigation, stock and domestic use, riparian and environmental flows. It was recognised by regulators that State Water could improve its efficient levels of operations and a realignment of the organisation into a functional structure was undertaken in 2008. In conjunction with this realignment, State Water has also embarked on the development of a more structured, rigorous and systematic approach to asset management. This paper outlines the background and operating environment of State Water, including the drivers for change. It demonstrates how it has started this process and outlines work to date and the path the Corporation is moving along into the future. It will examine the Asset Management Framework State Water has developed to provide a high level framework which ties together the business and asset planning strategies, policies, systems, activities and relationships required to systematically implement State Water's asset management business discipline.

How To Improve Profitability Of Metal Mills Through Asset Management Services

L Dong & HN Sun, Paper 20

After over 20 years fast development, China's metal industry is facing challenges from over-capacity as well as increased costs of raw materials, energy and labour. Improving equipment availability and efficiency and reducing maintenance-related costs and losses are key measures for metal mills to lift their profitability. This paper describes a successful case that the SKF service team helped a Chinese metal mill to reduce its planned and unplanned production downtime as well as maintenance costs of rolls, spares, grease, energy and labor through integrated asset management services. The services included client-need analysis, EAM implementation, criticality / RCM analysis, spare alignment and optimization, online and offline condition monitoring, RCFA, KPI following up, training and etc.

Asset Management Implementation At Leading Oil Refinery In Asia

V Anantaratikun, Paper 21

Maintenance organization is structured differently in individual companies, but in most organisation we can recognize the need for a function that sees its purpose as one "Matching Maintenance and Operating efforts to business needs". That short phrase carries a lot of implications: • Planned maintenance is done because there is a business case of doing it. • A Conscious decision can be made to run to failure on some equipment where it makes sense from a business perspective. • Prioritisation the work to ensure that important works are properly defined and completed before less important works. • Effective business process with clearly defined roles & responsibilities for each discipline. • Develop and measure

Key Performance Indicators prior, during and post the program. This paper attempts to describe a real world case study of asset management development and deployment at 560,000 bpd oil refinery. The key components of the implementation include assessment, asset strategy, risk based work selection, work planning & scheduling, operator basic care, root cause analysis, job performance profile and key performance indicators. As the result, the refinery is able to achieve +7% work productivity, and more than 450% ROI with payback in less than 11 months.

From Paper Mountain To Electronic Dashboard

P Litchfield, Precis 22

Documenting the condition of 39 hydro generators and 20 thermal generators, which are divided into 27 asset groups used to take 20 engineers around four weeks. The output of the process being in excess of 1000 sheets of printed text in over 27 volumes which included condition scores and profiles, history and failure modes, all of which had varying degrees of use throughout the remainder of the year. This output was then fed forward into the Asset Management Plan and other business processes. A project team was tasked with developing an electronic dashboard that replaced the paper documents, which was capable of being updated throughout the year. An additional benefit to come from the project was that engineers were allowed to continue their engineering role and station staff that needed to reference plant condition also had access to the very latest data available. This paper will document the transition from a paper based life cycle study to an electronic based dashboard which slices and dices plant by asset or location, displays condition and allows assets to be compared location by location.

The Application of Expert Knowledge to Implement An Intelligent Maintenance System

EJ Amaya & AJ Alvares, Paper 24

Maintenance activities play an important role in keeping performance, reliability and safety levels in process and manufacturing plants. In the last decades, Condition Based Maintenance (CBM) have been used in many industries, the main idea of CBM is to monitor the health of critical machine components and system almost in real time during operation and support the maintenance decisions based on the assessed condition. Recently, many companies are developing a new philosophy in maintenance technology called IMS (Intelligent Maintenance System). In this paper is shown an IMS based on OSA-CBM (Open System Architecture for Condition Based Maintenance) architecture. Furthermore, it is present the seven OSA-CBM layers implementation, especially the diagnostic layer using an expert system. Finally, satisfactory fault diagnostics has been verified using maintenance indicators before and after the IMS installation in the hydroelectric power plant of Balbina. These valuable results is using in the decision support system to pre-schedule maintenance work, reduce inventory costs for spare parts and minimize the risk of catastrophic failure.

An Analysis Of Rolling Mill Data To Identify Optimum Planned Downtime Strategies

G Wood, Precis 26

How does planned downtime influence unplanned downtime of manufacturing equipment? How can the total time lost, planned plus unplanned, be minimised? Symmetrical and asymmetrical hyperbolic relationships between planned and unplanned downtime are supported by data from steel rolling mills. The curve of total downtime exhibits a flat minimum, allowing experimentation with the planned time without risking a significant increase in the total downtime. A cost in dollar terms is assigned to each of the planned and unplanned downtimes to enable an economic decision for the optimum planned downtime. In many cases an increase in planned downtime results in a significant reduction in total downtime cost. The merits of total downtime minimisation under the prevailing maintenance regime and then moving to a better regime are discussed. The result provides a tangible basis to counter a trend to cut maintenance time and budgets in a period of financial crisis. This analysis can be applied to other manufacturing processes.

Using Web 2.0 Tools To Facilitate Knowledge Transfer In Complex Organisational Environments - A Primer

G Murphy, Paper 28

An often neglected but well recognised aspect of successful engineering asset management is the achievement of co-operation and collaboration between various occupational, functional and hierarchical levels present within complex technical environments. Engineering and technical contexts have been well documented for the presence of highly cohesive groups based around functional or role orientations. However while highly cohesive groups are potentially advantageous they are also often correlated with the emergence of knowledge and information silos based around those same functional or occupational clusters. Improved collaboration and co-operation between groups has been demonstrated to result in a number of positive outcomes at an individual, group and organisational level. Example outcomes include an increased capacity for problem solving, improved responsiveness and adaptation to organisational crises, higher morale and an increased ability to leverage workforce capability. However, an essential challenge for organisations wishing to overcome informational silos is to implement mechanisms that facilitate, encourage and sustain interactions between otherwise disconnected groups. This paper reviews the ability of Web 2.0 technologies and mobile computing devices to facilitate and encourage knowledge sharing between "silo'd" groups. Commonly available tools such as Facebook, Twitter, Blogs, Wiki's and others will be reviewed in relation to their applicability, functionality and ease-of-use by engineering and technical personnel. The paper also documents three case examples of engineering organisations that have successfully employed Web 2.0 to achieve superior knowledge management. With a number of clear recommendations the paper is an essential starting point for any organization looking at the use of new generation technologies for achieving the significant outcomes associated with knowledge transfer.

Reconfiguring a Primavera Database System for Maintenance Projects

G Gan, Paper 29

Primavera P6 is a widely used tool for planning both big and small maintenance projects as it can be a very powerful tool to track project progress and cost and business. Unfortunately, for various reasons, when used for maintenance rather than capital projects, P6 implementations are often suboptimal and fail to deliver the promised benefits. Common faults include cluttering of databases shared by multiple users, improperly assigned codes and difficult integrating data with CMMS data. This paper summarises the experiences gained over the past five years from using and implementing Primavera software for clients from mining and processing industries. Methods of configuring the software for optimal usage in the maintenance project environment will be presented. Common problems seen across the industries are also discussed. Finally, improvements for implementing best practise P6 systems will be recommended. A case study is used to demonstrate how the database can be reconfigured to suit the maintenance environment.

Computer Modeling Of Maintenance Policy Change In Defence

G Kerr & S Nesterov, Paper 30

Most assets that allow businesses and government to deliver required services have long term operational and maintenance lifecycles. Through life, these assets undergo changes in maintenance policy due to acquired maintenance data, advances in technology, and changing financial and contractual conditions. This paper explores the application of computer modelling techniques to evaluate the effectiveness of existing and alternative maintenance solutions before significant resources are committed to changing system operation and maintenance practice. It presents a modelling approach in which the performance of an existing in-service maintenance system using alternate maintenance policies through analysis of model outcomes. The paper describes the Collins Class Submarine maintenance system, along with some alternative maintenance options, and defines suitable criteria for measuring maintenance performance. Finally, corresponding stochastic models, underlying assumptions and modelling results are presented.

Mobile Geographical Information Systems Implementation For Water Infrastructure

S Harrison, Precis 31

Today mobile computing technology is an integrated part of our business processes as it enables non-location specific task completion. Geographic Information Systems (GIS) are a vital source of information for field-based workers; however this information is normally only available via a PC and corporate network. The combination of GIS and mobile computing technology enables field-based staff to make informed decisions in the field without the need to 'return

to base' or attempt to transmit this information over the phone. The Veolia Water pipeline maintenance staff on the Western Corridor Recycled Water Project are now using this technology to provide efficient field information transfer. Western Corridor is owned by Queensland state authority WaterSecure and is part of the South East Queensland Water Grid. There are now a number of rugged and compact devices on the market that enable this function and more. The devices chosen for this application are also deployed to perform: asset data capture, stock management and incident reporting. The devices selected also include a barcode scanner and camera. The scanner is used to assist with asset and spares identification and the camera is used for asset condition capture and incident reporting. The system software enables customised forms to be loaded into the field devices to capture any geographically referenced dataset required.

Predicting The Impact Of Asset Performance On The Punctuality Of Services In A Suburban Railway

T Howard, Precis 33

Within the rail industry, the use of traditional reliability block diagrams and availability modelling techniques has been limited in application to individual elements of the total system. This limitation arises in part from the complex interaction between the primary physical system elements; signals, track, points, power, rolling stock, etc, but also from the impact of non-asset events such as those arising from operators and passengers. Overlaying this with a multifaceted timetable of services has meant that a system (network) view of the relationship between asset performance and the punctuality of services has been too difficult to model and undertake a quantitative predictive analysis. Within RailCorp, this has constrained the organisations ability to substantiate asset investment decisions with measurable improvements to service punctuality.

Steady State Maintenance In Rail

R Simpson, Precis 34

In 2002, RailCorp adopted a 'Steady State' maintenance strategy for the maintenance of below rail infrastructure assets in the Sydney metropolitan area. Central to this maintenance strategy is the fact that assets have a life expectancy beyond which it becomes uneconomic to maintain them. For infrastructure systems such as rail where there is a large population of individual assets of various ages and conditions, a certain number become due for replacement each year. If assets are replaced just before they become inefficient and unreliable, then the total asset condition is considered to be in 'Steady State'. The average number of assets to be replaced each year can be calculated using the recorded asset population, an engineering evaluation of asset life and an assessment of asset condition. This calculation is useful in determining annual budgets, forecast maintenance requirements and in the determination of any 'Financial Gap' (ie. the difference between scope achieved and the 'Steady State' target).

Modelling Tools To Predict The Condition Of Underground Sewer Assets

R May D Tran J Mashford & D Marlow, Paper 35

Understanding the condition of underground sewer assets is an essential step within the asset management cycle. Conventional methods of sewer inspection are both time consuming and costly, which restricts the number of assets surveyed each year to a small sample of the entire network. Consequently, accurate models are required to predict and forecast the condition of non-surveyed assets to allow asset managers to prioritise and plan reinvestment over the entire network. In a comparative study, the utility of several modelling approaches was investigated for two key tasks: ranking the relative risk of assets, and predicting the condition grade of assets. Ranking systems were built using an expert hierarchical ranking model, and a novel fuzzy hierarchical ranking model. Predictive models were developed using conventional statistical Markov models, and a novel data-driven modelling approach using support vector machines (SVMs), which is an artificial intelligence technique that is similar to artificial neural networks (ANNs). Results of the study showed that, in comparison to the expert model, the fuzzy ranking provided an improved framework for model development and the ability to better encapsulate expert knowledge, which may be imperfect or uncertain. In terms of condition prediction, the misalignment of the objectives of surveys and modelling led to sparse data sets that prohibited statistical modelling approaches. In contrast, the method based on SVMs was able to achieve 96% correct classification using readily available survey data.

The Role Of Trust In Inter-Project Knowledge Transfer

A Wiewiora G Murphy & B Trigunarysyah, Paper 36

Knowledge is a powerful organisational asset yet intangible and hard to manage, particularly in a project environment where there is a tendency to repeat the same mistakes rather than learn from previous project lessons. A lack of effective knowledge sharing across projects causes reinventions that are costly, and time consuming. Research on knowledge transfer has focused mainly on functional organisations and only recent attention has been directed towards knowledge transfer in projects. Furthermore, there is little evidence in the literature which examines trust in the knowledge transfer processes. This paper studies how the three types of trust - ability, benevolence, and integrity impact on knowledge transfer from the inter-project perspective. Three case studies investigated the matter. A detailed description of the work undertaken and an analysis of interviews with project professionals from large project-based organisations are presented in this paper. The key finding identifies the positive impact of ability trust on knowledge transfer. However, it was also found that perception on both integrity and benevolence varied across organisations suggesting that there can be a possible impact of organisational factors on the way trust is perceived in inter-project knowledge transfer. The paper concludes with a discussion and recommendations regarding the development of trust for inter-project environment.

Does An Asset Management Standard Already Exist

J Kennedy, Paper 39

There is no Asset Management Standard published by an internationally recognised standards body. Recent efforts to extend PAS55 to a full ISO Standard are, like the development of many valued standards, unlikely to produce an outcome for many years. However, other shorter term options may be available. Asset management has been defined by some international peak bodies in the asset management domain as a lifecycle management process. This definition would tend to focus attention on the processes that comprise lifecycle management of a physical system. Such a standard already exists in the form of ISO/IEC 15288:2002 Systems engineering – Systems lifecycle processes which was accepted as an AS/NZS standard in 2003. This paper shall identify why we need a standard for asset management and describe how the latest IEC 15288:2008 and its many supporting ISO, IEC and other international standards can provide that capability now. This proposition shall be tested by mapping the standards to the Asset Management Council's top level Asset Management Process Model.

SF6 Emission Reduction From SF6 Equipment, A Life Cycle Approach

ZN Jabiri & D Sharafi, Paper 41

Environmental pressures from governments, investors, customers, suppliers, and communities have raised environmental awareness of asset-intensive organisations in responsible management of Sulphur Hexafluoride (SF6) equipment, as the most potent greenhouse gas known. Investigation contributing factors to SF6 emission from equipment assists asset owners to better understand their current environmental footprint, which eventually influences their decisions on capital and operational investment, such as asset renewal, utilizing new pollution control technologies, improvement of current or proposed capital expenditures, and direction of environmental activities. This paper presents a Life Cycle Approach to equipment utilization, which first assists in identifying cause of SF6 emission from equipment, and second proposes potential solutions and areas for improvement. This approach has been initiated in Western Power since two years ago, and so far has led to reduction of 40 kg of SF6 emission from High Voltage Circuit Breakers across its network.

An Inspection Optimization Model For A System Subject To Hidden Failures

S Taghipour D Banjevic & AKS Jardine, Paper 44

This paper proposes a model to find optimal periodic inspection interval over a finite time horizon for a multi-component repairable system subject to hidden failures. The components' failures can only be rectified at periodic inspections. At inspection, a failed component is either minimally repaired or replaced with some age dependent probabilities. A penalty cost is incurred for the elapsed time from a failure to its detection at the next inspection. This model finds the optimal inspection interval with minimum expected cost. The main technical problem of finding the expected cost with delayed replacement or minimal repair of a component is solved in this paper. Recursive procedures are developed to calculate probabilities of failures in every interval, expected number of minimal repairs, and expected downtimes for optimization over a finite time horizon. Numerical example of the calculation of the optimal inspection frequency is given. The data used in the examples is adapted from a hospital's maintenance data for a general infusion pump.

Asset Management And The Capability To Get There

G Hopkins, Paper 45

The combined regulated asset value of electrical distribution network companies, in Australia is approximately \$40bn. The operating expenditure (opex) for asset based activities and capital expenditure (capex) to maintain and grow that value is in the vicinity of \$6.8bn for a year. The importance of managing assets is self-evident; the importance of assuring a learning asset management business to execute this management is less evident. The documented statistics that support these expenditures are based on highly summarised and aggregated data that makes it difficult to determine the performance of assets. Throughout both the publicly available and internal documents in a distribution network businesses the performance in relation to the asset life cycle standard is typically presented in terms of operational performance and volumes of work as agreed in the previous period. The operating expenditure budget for maintenance activities is consistently under spent in power utilities reviewed and a common observation is that assets are not performing to life cycle expectations. This counterintuitive relationship needs explanation. The view of many asset managers is that a large proportion of the capital replacement/renewal budget is in fact 're-badged' maintenance. This capitally funded maintenance effort is a method of re-setting the maintenance strategy by providing a new asset injection. That is providing capital injection to alleviate capacity issues in applying effective maintenance across the network. This work is essentially providing a catch-up facility for maintenance performance. Providing essential maintenance activities through remediation is a capital based version of corrective maintenance. This is not a generally accepted method of executing and improving an Asset Management strategy and hence jeopardises efficient delivery of effective asset management services. The considered view is that most

Distribution Network Service Providers (DNSPs) do not have the processes and the systems in place to establish asset management services in a way that would promote continual improvement. Hence establishing asset management presence (Asset Management 'business') needs a clearly identified strategy, processes and systems and, most importantly the capability and organisational maturity. This is a separate and very different approach to developing an analysis of performance through the collation and aggregation of multiple sources of data for a regulatory submission. Although the requirements of the regulator should not impact the asset management effort, the lack of systems and processes make it the only time when the utility organisation must have an in-depth review. The regulatory review of a power utility in Australia does not appropriately cover the effectiveness of the asset management business. In order to break the cycle of maintenance strategy substituting for asset management strategy and a five year regulatory review substituting for a regular Asset Management strategy review there needs to be a structural change in the typical asset management organisation. Asset managers need be in the forefront of driving business process management, supported by robust information systems that have embedded governance and quality features that are asset management centric.

Leading Performance Management Solutions For The Global Utilities Sector

T Saker & R Champagne, Paper 46

For decades now, businesses have been dealing with a range of Performance Management challenges, from the simple measurement of organisational and work unit performance, to the larger and more complex challenges of establishing reporting transparency and driving accountability for sustainable results. While these challenges are not new, the increasing visibility of business failures means that the Performance Management Process and its impact on the business model, revenue targets and basic stakeholder commitments is under greater scrutiny than ever. To be truly successful, utilities must employ a company-wide approach to Performance Management - driving accountability and business performance by designing strategy, goals and performance measures to support the initiatives, investments and daily operating priorities of the business. In this paper, we will discuss the role of the "Enterprise Level" Performance Management Process (EPM) and its importance in reestablishing the confidence of stakeholder groups through programming the corporate "dashboard" with the right measures, the right targets, aligned accountabilities, and effective linkages to business. We will discuss the lessons learned and the implementation and readiness challenges in embarking on such an ambitious initiative.

Driving Best Practice AM-IT Management - International Network Asset Management Information Technology Services Consortium (NAMITS)

T Saker & E Keating, Paper 47

For some time now, Transmission and network companies have been contemplating a means by which to effectively measure and understand the value of IT in enabling superior business and asset management performance. The quality and delivery effectiveness of the business support services provided by Information Technology (IT) organisations contributes significantly to the performance of every section of the Transmission/Distribution Network Service Provider (T/DNSP), and to the T/DNSP as a whole. Asset Management groups in particular rely heavily on IT to provide the data, functionality and services that enable them to manage the network assets and to achieve target levels of performance and reliability. With escalating issues of aging infrastructure and the continued load growth and expansion of the network necessary to meet customer demands, utilities must ensure now more than ever that their assets achieve the highest levels of performance and reliability. Capable and effective network asset management and capital project delivery is therefore crucial to the success of any T/DNSP. In this paper we will discuss the Network Asset Management Information Technology Services Consortium Study (NAMITS), a program founded in 2008 and driven by the transmission industry to provide insight to T/DNSP's worldwide into how and where they can improve the effectiveness, efficiency, focus or responsiveness of their IT support to the Asset Management business.

Defect Elimination Management In An Operating Environment

G Elliott, Paper 48

Santos is implementing a complete business process for managing defect elimination within its assets. We describe the journey from ad hoc investigations to a fully integrated management process yielding focused solutions to root causes behind defects. This paper describes the need for change, the processes and responsibilities in the organisation, the root cause analysis methodology and the implementation issues at all levels, from shop floor to management.

Forecasting Renewal Expenditure For Council Buildings

D Kumar I Patnaikuni & S Setunge, Paper 49

The performance or service life prediction of building systems and their components is a very difficult and complex task. Though many technical papers related to material and component durability have been published over past two decades, they had a negligible impact on the development of an effective approach for durability design. Though ISO presents a valuable methodology based on factor method in the area of service life estimation but it requires considerable local knowledge about the degradation of components and materials. The factor method is very simple but it does not take account the variability of the processes involved. A lot of work is being done in the area of service life prediction, but there is very little that can be readily used by building as-set managers. Hence, there is a great need to develop a simple model which can be easily calibrated and used. The model proposed here can be easily implemented by practitioners and would be of benefit to infra-structure Managers of City Councils.

Throughput Centered Prioritization In The Presence Of Buffers

R Pascual D Godoy & D Louit, Paper 50

In an environment of scarce resources and complex production systems, prioritising is key to confront the challenge of managing physical assets. In the literature, there exist a number of techniques to prioritize maintenance decisions that consider safety, technical and business perspectives. However, the effect of risk mitigating elements – such as intermediate buffers in production lines – on prioritisation has not yet been investigated in depth. In this line, the work proposes a user-friendly graphical technique called the System Efficiency Influence Diagram (SEID). Asset managers may use SEID to identify machines that have a greater impact on the system throughput, and thus set prioritised maintenance policies and/or redesign of buffers capacities. We illustrate its applicability using three study cases: a four-machine transfer line, a vehicle assembly line, and an open-pit mining conveyor system. The results confirm that the machines with greater unavailability are not necessarily the most important for the efficiency of the production line, as it is the case when no intermediate buffers exist. The tool also highlights how common-practice Pareto analysis using capital investment can be criticized, as low cost equipment may be the critical factor for the throughput, and thus, the first to be chosen if efficiency is considered as key performance indicator. As a decision aid tool, SEID emphasizes the need to move from a maintenance vision focused on machine availability, to a systems engineering perspective.

Progress In Applying PAS55 In Australia

S Lemon, Precis 51

Many organisations would like to develop their asset management systems in line with a common framework or standard, allowing them to take advantage of international best practice developments and to facilitate benchmarking across different organisations and industries. PAS55, the British Standards Institution's specification for the "optimised management of physical assets", is rapidly emerging as the de facto international standard for asset management, having been introduced in 2004, updated in 2008, and now forming the basis for the development of ISO standard '55000' (with the support of the Asset Management Council and Standards Australia). This presentation focuses on case study examples of organisations that have used PAS55 as a framework for the development of their Asset Management Systems, and the experiences of organisations that have been assessed and certified against PAS55 in Australia. This presentation also discusses how the Institute of Asset Management (IAM), as the original sponsor for the development of PAS55 and proponent of the new ISO standard, has introduced formal criteria for the appointment of companies as 'Endorsed Assessors' for PAS55, and for the assessment process itself. This ensures that organisations undertaking assessments are suitable and reputable, and that their assessment processes have been formally acknowledged as consistent with the IAM requirements.

Use Of AM Fundamentals And Techniques To Optimise A Manufactured Product.

P Oliver, Precis 52

Most people associate Asset Management with the management of big utilities, large companies or consultancies. It is seen as a process by which an organisation's assets are managed from cradle to grave in a way that can be measured and managed in a cost accountable and hopefully profitable way. An understanding of the concepts and ideals of Asset Management can also be a distinct advantage for small business and companies involved in manufacturing processes. If you consider all of the "possessions" of a manufacturer, and that these are actually assets of your company, no matter for how short a period, then you can start to see how mainstream asset management process can not only apply, but be beneficial to your company and its bottom line.

Mixing Oil And Water - Developing Strong Ties Between Operations And Maintenance Departments

I Winter, Precis 53

Many companies experience a breakdown in communication and shared objectives between Production (Operations) and Maintenance Departments. The development of such shared vision and objectives is becoming paramount to meeting the ever increasing safety, environmental and performance demands of businesses. This paper is aimed at:

- Identifying why communication between these departments breakdown.
- Identifying the factors which are not only critical for improving the relationships between these departments but also for gaining improved asset performance.
- Highlighting human aspects of work places and the needs of people which are important for success.

People need to be "Given life" in order to succeed and this is as important, if not more important than any technical program.

Quantitative Risk Based Replacement Of Critical Water Mains

D Zhang S Baxter & G Kane, Precis 54

Sydney Water's water network comprises approximately 21,000km of water mains ranging in size from 100mm to over 3000mm in diameter. Sydney Water manages its water network assets in two classes being either critical or non-critical. Critical water mains are defined generally as water mains with diameter 300mm and above. The non-critical water mains have smaller diameter and these mains have a lower impact when they fail. As such, a response based maintenance strategy is developed to manage non-critical water mains and their renewal is based on the failure history. In contrast, critical water mains pose a high consequence of failure both from a water supply perspective and for community or social impacts, and require a more proactive management approach. To prevent the potential failure of critical water mains, Sydney Water has developed a quantified risk based replacement model to assist the renewal decision-making. This paper provides an overview of Sydney Water's quantified risk based replacement model, understanding of likelihood of failure and consequence of failure from both direct cost to Sydney Water and the social impacts to the community, decision-making process, its effectiveness and future improvement areas.

Develop Integrated Asset Management Decision Support Practice

L Ma & Y Sun, Precis 55

There is increasing demand for optimising Engineering Asset Management (EAM) decisions. EAM activities without optimisation could result in significant financial waste while optimal decisions must be made based on a holistic view of the whole business objectives, activities, resources, processes, asset conditions and other constraints of the organisation. This presentation demonstrates a novel, integrated decision support methodology to address such a need. This methodology enables multiple factors, and different objectives and constraints to be considered effectively in making globally optimised decisions. The decision support platform generated based on this methodology is flexible and can be easily customised to meet individual organisations' needs. Several industry case studies are presented to illustrate the applicability of the proposed methodology.

Uniform Asset Coding Structures Improve Asset Management Capability

I Houthuysen & E Krauss, Precis 56

Asset identification in a business is generally driven by two requirements: Positive identification of equipment for engineering and maintenance purposes and the need to report on the financial status of Assets. The latter is related to the fiscal position and tax obligations, maximising the capital outlay or operating costs. The former is identifying the equipment unambiguously for a variety of operations and maintenance functions. Many organisations find themselves maintaining separate Asset Registers for each of these drivers. In many instances that leads to some degree of confusion when the financial and technical people start discussing assets, as the boundaries of these assets are often different. The paper proposes that alignment of Asset Registers is possible and desirable providing tangible benefits to the Business. Uniform Asset coding enables simplified record keeping, reporting and decision making improvements, as the case study explains.

Reliability / Availability Modelling at End of Asset Life

E Krauss, Precis 57

While generally acknowledged to be of value to Projects and Project deliverables, Reliability / Availability modelling (RAM) has not reached its full potential during the Operations phase of many Plants or Process Assets. It is even less applied during a critical phase in the Asset Life Cycle, namely when an Asset nears its end of useful life. This can happen for various reasons, be it that the Asset will be abandoned due to obsolescence, changes to processes, Consumer demand or a myriad of other valid reasons. Optimising plant maintenance and uptime are among the key elements that need to be considered if the end of life phase, if only for the reason of least expenditure for maximised plant output. RAM can assist in the decision making of how to manage at optimum level the declining phase in Asset life. The paper examines some drivers for optimisation in this phase and demonstrates in a case study the value derived from this reliability and risk centred approach.

Blind Man's Bluff: Understanding The Need For Improved Information Sharing Between Organisations

P Kril, Precis 58

Often Asset Management decisions are made in isolation. Such decisions are based on the information and experience found only within the organisation, or worse still within one segment of the organisation. The lack of communication within and between businesses, means that less than complete information is being utilised to make asset management decisions that have the potential to affect the very core of the business. Without such information exchanges, asset management organisations run the risk of making ill informed purchasing, operational, maintenance and replacement strategy decisions, that result in sub-optimal outcomes for the business. Understanding the need for improved information sharing within and between organisations is a critical task for the asset manager of tomorrow.

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Transfield Services delivers essential services to key industries in the resources and industrial, property and infrastructure sectors. A leading global provider of asset management, operations, maintenance, and project management services. Transfield Services has more than 28,000 employees in Australia, New Zealand, the United States, the United Arab Emirates, Qatar, New Caledonia, South East Asia, India, Chile and Canada. Transfield Services Limited is publicly listed in Australia. Global Annual Revenue in 2009 was A\$4.3billion.

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Assetivity is a fast growing consultancy that specialises in physical asset management. A hybrid management and engineering consulting organisation, we focus on making improvements to Engineering, Production, Maintenance and Supply Management processes and systems for organisations in capital-intensive industries. This includes many leading, blue-chip, global organisations in the Mining and Mineral Processing, Oil & Gas, Utilities, Power Generation, Defence and Heavy Manufacturing sectors.

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CIEAM



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The Cooperative Research Centre for Integrated Engineering Asset Management (CIEAM) has established itself at the centre of engineering asset management research and development in Australia, and as the hub of an international network of leading institutions around the world. Over the last seven years CIEAM has addressed the issues of soaring asset maintenance costs through an integrated program of technology development, management solutions, coordination with national and international industry, research groups, and education and training. Working with four industry sectors across five key research programs CIEAM's aim is to improve the effectiveness and efficiency of infrastructure management; and the profitability of Australian industry. CIEAM's research is based on finding solutions for addressing:

- The ageing national engineering infrastructure issue
 - A general under-investment in asset maintenance
 - A reduction in the cost of maintenance and the total cost of engineering asset ownership
 - A new integrated asset management regime across all industry sectors
- CIEAM's participants are working together with leading Australian researchers and consultants to address key issues in asset management. CIEAM's research is aligned with industry needs and their members are committed to the challenge of improving Australia's asset management systems.

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The Asset Partnership



Welcome Function Sponsor

The Asset Partnership delivers value driven outcomes for the management of physical assets. We focus on three key outcomes:

- Throughput improvement from existing assets by optimising equipment reliability, availability and operational use of the assets
- Reduction in the cost and risk (safety, environmental, operational) of asset ownership
- Optimisation of capital outlay on assets.

The Asset Partnership enjoys an enviable reputation for delivering 'bottom line' impact solutions through our partnership-style working relationship. Our people have hands-on experience in a wide range of industries, particularly those that depend on the efficient and effective deployment of physical assets.

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Monash University



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Monash University has a global outreach with campuses in Australia, Malaysia and South Africa. It has earned world standing in many fields for its research and teaching. Of its 55000 students, 7500 study off-campus. Monash has been involved in asset management education for over 20 years. Based at its Gippsland Campus in the power generation belt of Victoria, its postgraduate programs in maintenance and reliability engineering have evolved to reach students in every continent. Students can customise studies to best meet their needs. Two graduate certificates, a graduate diploma and master's degree are offered. The programs operate on a semester length basis, enabling entry at mid-year. Web-enhanced delivery is used in the continual improvement of Monash distance teaching. Ray Beebe, who co-ordinates the programs, has presented a paper at every ICOMS up to 2009.

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Airservices Australia



Afternoon Tea Sponsor

Airservices Australia is a Government-owned corporation providing safe and environmentally sound air traffic management and related airside services to the aviation industry. It has responsibility for covering the Australian Flight Information (FIR) region which is over 11 percent of the earth's surface. This includes not only Australian airspace but also international airspace over the Pacific and Indian Oceans. Airservices has a fixed asset base of more than \$600 million across 600 sites around Australia. We have 3000 employees including approximately 900 air traffic controllers working from two major centres in Melbourne and Brisbane and 26 control towers at international and domestic airports. A staff of over 650 provide aviation rescue and fire fighting services at 21 of the nation's busiest airports where there are more than 300,000 passenger movements a year. Airservices delivers a wide range of other services to commercial passenger, freight and charter airlines, airport owners and operators, the Australian Defence Force and general aviation community. Australia is a signatory of the International Convention on Civil Aviation. Australia's commitment to this convention is stated in the Federal Government, Air Navigation Act of 1920. Airservices is required to provide services and facilities for purposes relating to the safety, regulation or efficiency of air navigation. The Air Services Act 1995 requires Airservices Australia to conform to the International Convention on Civil Aviation and associated Annexes. Our services are regulated activities and Airservices holds operating certificates for Civil Aviation Safety Regulations (CASR) parts 139H, 143, 171, 172 and 173.

Contact: Brad Thompson
brad.thompson@airservicesaustralia.com

ICOMS 10 Exhibitors

ARMS Reliability



ARMS Reliability is a services, training and software organisation specialising in reliability analysis and root cause analysis for both new and existing projects. The business was founded on a passionate desire to empower other companies to move away from reactive behaviours, recognising that technical solutions alone do not drive this transition. This premise has remained unchanged since we commenced operation in 1995. Our goal is to perform on as wide a field as possible whilst maintaining our reputation for service excellence.

Contact: John McIntosh
jmcintosh@globalreliability.com

Assetivity



Assetivity is a fast growing consultancy that specialises in physical asset management. A hybrid management and engineering consulting organisation, we focus on making improvements to Engineering, Production, Maintenance and Supply Management processes and systems for organisations in capital-intensive industries. This includes many leading, blue-chip, global organisations in the Mining and Mineral Processing, Oil & Gas, Utilities, Power Generation, Defence and Heavy Manufacturing sectors.

Contact: Sandy Dunn
sandy.dunn@assetivity.com.au

Asset Management Council



The Asset Management Council is a leading organisation for physical asset management through several key areas: developing a body of knowledge, promoting excellence, and educating and supporting practitioners and the broader community. The Asset Management Council, a non-profit organisation and Technical Society of Engineers Australia, is continuously working to promote, foster, facilitate and network the practice of maintenance engineering and asset management.

Contact: info@amcouncil.com.au

CASWA



CASWA is a high technology company and develops new technology that supports its engineering asset management expertise. We have extensive experience developing "sensor to summary" remote sensing, data acquisition, storage, analysis, and reporting systems for Industrial and defence customers. Our business model allows our customers to leverage new technology and extensive R&D efforts without the expense and risk of an in house R&D program and our strong links with academia and the engineering community keep us at the forefront of EAM science and technology.

Contact: Paul Kelly, paul@caswa.com

OMCS International



OMCS International is an Australian based company specialising in consulting, training and implementation of reliability improvement methods which are based on RCM but start with your existing maintenance program rather than start from zero. The core of our business is known as PM Optimisation (PMO2000®) with the living program driven with Data Analytics and Modelling and Investigation Management methods. The complete software and methods can provide an enterprise wide approach that is deployed by many global companies. PMO2000® is SAP Certified.

Our training programs have been delivered to thousands of operations and technical people. We have a network of over a dozen licensee companies all over the world to which we license the right to distribute, implement and train in our methods.

Contact: Allison Rae
allison.rae@omcsinternational.com

Peerless Industrial Systems



And Epigen – Celebrating 40 years in 2010. Coating, Lining & Repair materials - Epigen and Prolong composite polymer ranges include linings for acid & aggressive chemical resistance, grouts & backing compounds, coatings for Potable Water & WWT facilities, process tank linings, non-skid flooring, pump repair & rebuilding materials, turbine & motor chocking grouts, joint sealants, adhesives, metal repair compounds and emergency repairs. The company has long-term associations with clients in the water industry, mining, mineral processing, petroleum, refining, materials handling and storage industries. Recent major projects include the full provision of the linings for the Merrimac Treatment Plant expansion and upgrade on the Gold Coast, North Auckland WWTP, with past notables being the WA21 innovative wastewater treatment plant expansion at Woodman Point in Perth's southern suburbs, and the provision of full lining materials for the Landers Shute Water TP north of Brisbane. Water Industry products are approved to AS4020 and have a successful history dating back to the 1970's. The Epigen Chemproof 4000 range of novalac epoxy products; a leader in the field of acid and aggressive chemical resistance; has been installed at major resource and processing sites throughout Australia. Peerless Industrial Systems enjoy an excellent reputation in liaising with contract applicators, consultant design engineers and asset owners to qualify a protective system for their particular operating environment. Working with all parties ensures that the principle receives a system that achieves the maximum service life.

Contact: Nick Subotsch
nick@epigen.com.au

ICOMS 10 Exhibitors

Relegen Pty Ltd



Relegen Pty Ltd is a leader in the development and delivery of ground-breaking asset management solutions for all industries. Years of experience working at a mission-critical level with Australian Defence, blue-chip multinational corporations, small and medium size business and local and federal government, has given Relegen an unparalleled understanding of the principles and best practices behind enterprise asset management. This know-how is the foundation of Relegen's in-house development of the most advanced enterprise asset management software system on the market, the baseLINE Framework. Relegen is Australian owned and has been in operation for more than 10 years.

Contact: Paul Bennett
paul.bennett@relegen.com

Rylson Group



The Rylson Group is an internationally recognised provider of management, engineering, and logistics consultancy services to a range of industries including the mining, mineral processing, oil and gas, power and energy, heavy industry, transport, utilities, defence, government, services, automotive, food and beverages, manufacturing and chemical processing industries. Rylson is a leader in its field offering innovative products and world-class services to its 'Blue Chip' client base in Canada, United Kingdom, S Korea, China, Philippines, PNG, Nauru, Solomon Islands, Indonesia, Western Samoa, Fiji, New Zealand and Australia.

Contact: admin@rylson.com.au

The Asset Partnership



The Asset Partnership delivers value driven outcomes for the management of physical assets. We focus on three key outcomes: • Throughput improvement from existing assets by optimising equipment reliability, availability and operational use of the assets • Reduction in the cost and risk (safety, environmental, operational) of asset ownership • Optimisation of capital outlay on assets. The Asset Partnership enjoys an enviable reputation for delivering 'bottom line' impact solutions through our partnership-style working relationship. Our people have hands-on experience in a wide range of industries, particularly those that depend on the efficient and effective deployment of physical assets.

Contact: Stephen Young
Stephen.young@assetpartnership.com

The Online Workshop



The Online Workshop 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. The center for development is located in Melbourne Australia, with sales offices in Colorado USA, and support/sales offices in Brisbane Australia and Beijing China. While this company and product are new, they respectively have a bloodline that breeds success. KDR Creative Software Pty Ltd is the original author and owner of a highly successful computerized maintenance management software application called FMMS. For the past eighteen years FMMS has been implemented for local and international customers including the Royal Australian Navy, Hydro Tasmania, Queensland Rail, BHP Petroleum, Hamersley Iron, LSI Logic, Seagate Technology, IBM, and Alcoa, enabling them to better manage the combined billions of dollars that they expend on maintaining their assets and keeping their workplaces safe.

Contact: Geoffrey Montgomery,
gmontgomery@theonlineworkshop.com

Transfield Services



Transfield Services delivers essential services to key industries in the resources and industrial, property and infrastructure sectors. A leading global provider of asset management, operations, maintenance, and project management services. Transfield Services has more than 28,000 employees in Australia, New Zealand, the United States, the United Arab Emirates, Qatar, New Caledonia, South East Asia, India, Chile and Canada. Transfield Services Limited is publicly listed in Australia. Global Annual Revenue in 2009 was A\$4.3billion.

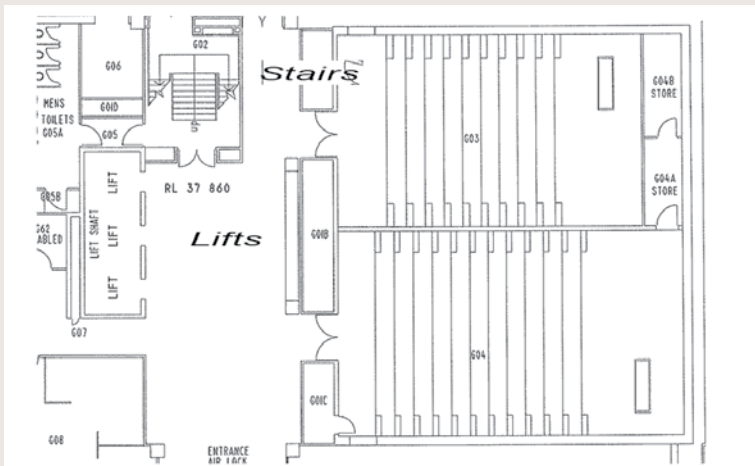
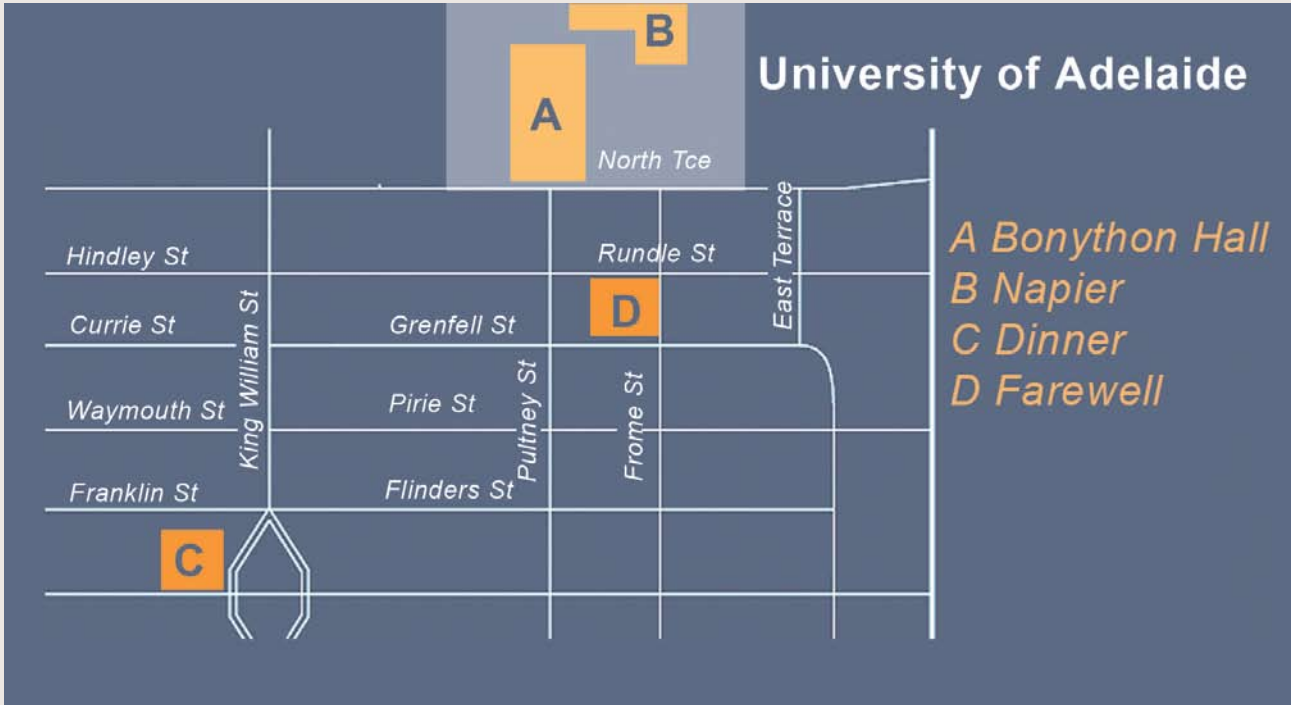
Contact: Paul Agar
AgarP@transfieldservices.com

Venue Sponsor

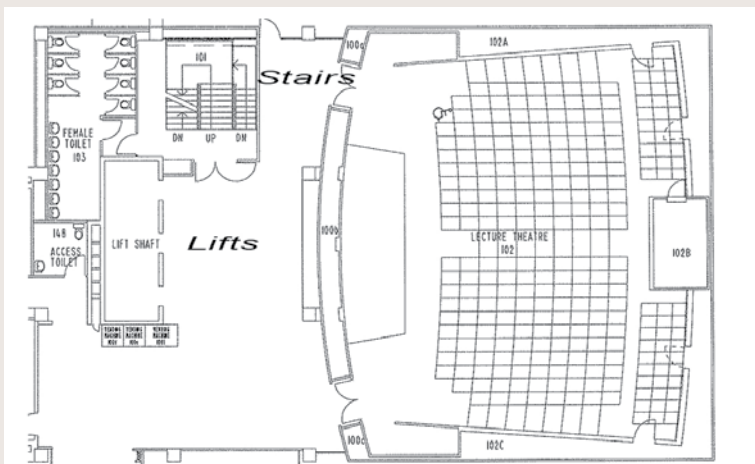


THE UNIVERSITY
OF ADELAIDE
AUSTRALIA

ICOMS10 Venue Map



NAPIER:
 Ground Floor
 Stream B & Stream C





An industry leader in asset management



Australian companies and Governments are increasingly looking at innovative ways to get more out of assets.

There is currently an estimated **\$200 billion** worth of projects planned for the Australian oil and gas industry alone*. And Prime Minister Kevin Rudd has recognised the need to get asset management strategies right in order to make improvements to our ageing infrastructure.

Getting **the best out of an asset** is a **LifeCycle** process which starts at the development phase – not after.

Transfield Services provides **LifeCycle Solutions** for Asset management throughout the Asset cycle from project development through to operations, maintenance and modifications. Those who operate and maintain assets are now called upon to play a part in asset design and equipment selection. By doing so, it represents the best chance of **avoiding future maintenance costs and issues**.

How do we know? **Transfield Services is an industry leader in asset management.** We partner with Australian and international clients like Woodside, RasGas, Suncor, VicRoads, Australian Rail Track Corporation in South Australia and Sydney Water Corporation. Transfield Services is also the patron of the Asset Management Council.

Our **LifeCycle Solutions** asset management system provides a range of structured business processes which together with skilled management, assists clients to **achieve maximum value**.

Contact us today to find out more.

Paul Agar

Group General Manager Asset Management & Implementation

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