The 2002 International User Group Conference

VENUE

26th - 27th Feb 2002
Manly Pacific
Parkroyal
55 North Steyne, Many
Sydney
Australia

Over 70 delegates attended the 2002 Conference at picturesque Manly near Sydney - a direct reflection of the high profile now given to reliability issues in industry today. The Manly Pacific Hotel venue was conducive to a successful meeting.

The 2002 Conference kicked off with introductory comments from Chris Kelly and Kim Davidson. The impact of September 11 events on the North American industrial outlook was discussed, particularly in relation to US based users and their ability to travel to the conference.

At the conclusion of Day One of proceedings, attendees adjourned to the nearby 16' Skiff Club at the edge of Sydney Harbour for evening refreshments. The Strategic Conference represents an ideal opportunity to meet other reliability professionals and establish permanent contacts and friendships.

A post-Conference survey revealed that this was the most effective conference conducted to date. We look forward to an even bigger and better conference in February 2003.
We were once again thankful to the following people who took the time to prepare papers and presentations for the Conference. The quality of presentations was extremely high and many users remarked that they would return to their own organisations with some valuable new insights.

Conference Papers were presented by:

( we have some review notes from the different sessions ... click on relevant presenter or high-lighted topic to review notes )

Richard Blayden of Hatch Associates

Chris Traianou of Water Corporation of Western Australia

Ray Beebe of Monash University

Steve Allison of Fluor Global Services

Hugh Cassidy of Roche Mining

Fabian Kaica and Graeme Fleming of Hydro Tasmania

Craig Croxton of ABB Service

Peter Morrison of Port Waratah Coal Services

Soren Neilsen and Bent Noorgaard of COWI in Denmark

Dr Bob Platfoot of Covaris Pty Ltd

Peter Wilson of Mincom

Richard Blayden of Hatch Associates presented a detailed paper on the plant maintenance function and outcomes arising from world-wide experience as well as formal benchmarking exercises conducted by Hatch.
The original developer of the pre-cursor methodologies to RCM *Turbo* and SOS, Richard has applied a great deal of thought to issues facing maintenance departments in all industries for many years. His paper outlined the 'real world' of maintenance and core issues that face practitioners every day. Richard stressed the importance of a business based approach to asset management functions and where the true ownership of business performance lies.

The essence of Richard's discourse was that 'people' are the key to the success or otherwise of improvement initiatives and that a learning-based approach is what will facilitate sustainable improvement. There is a significant difference between 'knowledge' and 'information' and it is this area that needs to be addressed in order to achieve real results.

Chris Traianou presides over the implementation of RCM Turbo across the vast state of Western Australia.

This year, Chris presented on the role of RCM in the asset management process and gave an overview of a case study, the subject of which was the Kununurra Dam.

Originally constructed many years prior to the Ord River Scheme, the functions of the Kununurra Dam had changed considerably since commissioning. RCM *Turbo* was applied to develop new maintenance strategies reflecting these changed functions.

This exercise was also the subject of a special article in the Asia Pacific Maintenance Journal.

All the elements of a successful RCM project were present in this exercise, including local ownership of the process and resultant outcomes, and strong input from electrical, mechanical and civil experts. The traditional RCM *Turbo* "challenge sessions" were conducted at the completion of the project in order to ensure the required buy-in of all personnel to be affected by the new maintenance regime.

Like any other RCM *Turbo* assessment, the Kununurra Dam exercise was one of failure consequence minimisation and identification of risk.
Ray Beebe of Monash University once again provided valuable input to the Conference. This year, Ray presented on the options that maintenance practitioners have with regard to condition based monitoring of heat exchanger equipment. Shell and tube heat exchangers, feed-water heater, condensers and boilers were individually examined and CBM opportunities discussed.

For each of these equipment types, Ray introduced a number of typical failure modes and discussed the condition based approaches that might be adopted to each of these. Case study results were discussed and the estimation of optimal frequencies for relevant predictive tasks was explored.

Ray provided detailed hard copy papers which can be provided on request to users.

Steve Allison of Fluor presented on the process and outcomes of a pilot carried out on this large and complex piece of machinery. The business approach to decision making was stressed by Steve, in the context of risk identification and minimisation. The cost of maintenance is of course, a major focus for all power generators in Australia and the RCM Turbo optimisation approach was deemed suitable to achieving the desired outcome of optimum reliability at lowest cost.

Steve discussed the nuts and bolts of a maintenance strategy review project, the gathering of information from all the best available sources and the best way to co-ordinate all relevant resources to the project.

Other issues worthy of attention in the course of this pilot included Maintenance history, Bills of materials, Spare parts usage, Existing routines and the establishment of cost of downtime. It was noted that in any maintenance strategy review, solid information is not always readily available. Thus the power of RCM Turbo which allows the exploration of alternative scenarios and the testing of the sensitivity of varying decisions was put to good use.

At the conclusion of the pilot, the new schedules were compared to the existing ones and the extent of improvement measured through the use of RCM Turbo’s zero based budget report.

Steve felt that the pilot represented a robust process which promotes appropriate thinking about the assets under review and which reflects the business plan. Other important outcomes included increased knowledge of those involved in the pilot and the identification of design improvement opportunities.
When Hugh Cassidy left the Moura Mine in Queensland as maintenance manager presiding over the coal handling plant, it was not long before Strategic were again able to catch up with him. Now with Roche Mining, Hugh presides over the maintenance of assets at the Ulan Coal Mine.

Hugh presented on the approach to maintenance taken by Roche in its contract sites and then outlined the circumstances of a re-visit with RCM Turbo at Ulan.

The train load-out system at Ulan suffered a total stoppage arising from a broken shaft in the gear train. This resulted in 36 hours of expensive downtime. The consequences of this outage were substantial and there needed to be a solution that would ensure the minimisation of consequences into the future. In conjunction with Strategic and RCM Turbo, the root causes of this incident were identified and the outcomes of a review of strategies included a site wide check of similar equipment where the offending components had been installed at commissioning and a new, more effective vibration analysis practice commenced.

It was identified that the existing maintenance plan had been arbitrarily changed, extending the inspection frequency concerned to an interval outside of the P/f interval or warning time. A new, sustainable practice was developed using RCM Turbo and implemented from that time.

Fabian Kaica and Graeme Fleming of Hydro Electric Corporation (Tasmania) presented a dual paper. Fabian gave an overview of what Hydro Tasmania is looking to achieve as well as a description of the state-wide assets. Hydro Tasmania owns 27 power stations and 43 major dams, generating 10,000 gigawatts per annum. Total output from the generating stations is 2,260 megawatts. Fabian outlined HEC's high level goals which include improving long term asset reliability/availability and sustainability leading into National Electricity Market - i.e. to meet Guaranteed Asset Performance Targets.

RCM Turbo was selected by HEC to be the platform for the analysis of maintenance requirements.

The initial pilot implementation was conducted at the Poatina Generating Station, where the factors influencing reliability were identified as Design, Manufacture, Installation, operation and current maintenance practice.

While RCM Turbo is a methodology the implementation of which so often leads to reduced maintenance cost, the focus of Hydro Tasmania was strongly described as being aimed at improved long term Reliability and
Availability in order to maximise returns to their business.

The project assembled the best available knowledge for application to the analysis, including a project manager, a site experienced electrical representative, a site experience mechanical representative and a site engineer. These core team members will become the long term champions of reliability improvement initiatives throughout the corporation.

Key external support has been enlisted from Strategic (John Parrish), Shell Australia and representatives of other RCM Turbo Hydro generation users including Nick Van der Kwaak and Larry Pope of BC Hydro in Canada.

Graeme then presented in some detail the process observed in the project, the identification of failure modes and consequences and high cost failure modes.

In 2001, Strategic and ABB Service world-wide commenced a relationship which is now flowering on several continents. Craig Croxton presides over the Australian third party maintenance operations for ABB and was instrumental in gaining the support of his off shore colleagues in embracing the Strategic methodologies.

ABB was looking for a consistent platform for the development of maintenance strategies for its large world-wide clientele. RCM Turbo fitted the bill.

Craig's paper outlined the ABB approach to satisfaction of the needs of large industrials in terms of their asset management strategies.

As at June 2002, training for ABB personnel has been completed in Europe and South America, as well as in Australia and New Zealand. ABB's Kuala Lumpur office have also been extremely active, introducing SOS to the Malaysian Newsprint Mills in April 2002.
Peter Morrison of Port Waratah Coal Services gave a succinct presentation of the issues facing pragmatic maintenance professionals today. Beginning with an outline of his experience over many years with computerised maintenance management systems (their good and bad implementations), Peter went on to describe common factors that need to be overcome in order to achieve real improvement in any environment. These included:

- People were flat out.
- There was a flavour of the month fix:
  - New CMMS, RCM, TPM, OEE, RCA, Teams etc.
- Poor work control.
- Poor understanding of organisation.
- Little understanding of maintenance as a business.

Peter stressed the importance of getting the basics right in any maintenance operation as a platform for being able to embrace more formalised improvement initiatives.

Peter defined the basics as:

- Solid, well resourced, well disciplined organisation.
- Sound maintenance strategy - RCM.
- Well conceived and credible schedule aligned with operational requirements.
- Simple but sound work management system.
- Sound spares management.
- Good reporting, analysis and follow-up of maintenance progress.
COWI is an international engineering and maintenance consultancy practice with its head office in Denmark. Bent Noorgaard, Soren Neilson and Jakob Larsen made the trip to Australia for our conference again this year.

With over 2,200 employees, COWI is a large player in the field of engineering consultancy in Northern Europe.

Some of the large projects that COWI have been involved in were presented to the group as was COWI’s long term involvement in TPM principles.

Strategic’s relationship with COWI commenced with interest in SOS, where COWI made the necessary translation into Danish. SOS has been introduced to Danish Rail.

Peter Ormond has made several trips to COWI for training and presentation services, including working directly with COWI clients.

COWI’s second presentation revolved around their RCM work with Danish Rail. SOS was also applied there as a pilot, where the outcome from spares assessed was a 35% recommended reduction. It is expected that Danish Rail will proceed to embrace SOS throughout its operations this year.

Dr Bob Platfoot once again made himself available to address the user group. Bob’s presentation was in fact a formal ‘paper’ which he intends to publish shortly.

The outline of this presentation was as follows:

- Predictive maintenance strategy.
- Diagnostics-focused FMEA.
Failure modes detection.

Failure consequences.

Condition monitoring - assessment of value.

Criticality ranking.

The objectives for strategy review are to set up a maintenance plan for an asset, understand the value of condition monitoring investment, and ascertain where risk can be better managed.

There is a need to identify functional failure (the loss or part-loss of the intended design capability of a maintenance unit) and engineering failure (the precise mechanism by which degradation of the maintenance unit arises and may be described as a type of damage).

The process should identify the items of plant to be maintained, identify and understand the business imperatives for asset management. Based on this, develop a comprehensive set of maintenance procedures, then establish a schedule for the implementation of those procedures.

Implementation processes should include work management, spare parts analysis.

Outcomes include:

- Selecting the correct maintenance procedure.
- Predictive maintenance - establishing the value of condition monitoring at the design stage.
- Assessing value of condition monitoring in terms of outcomes.
- Assignment of equipment criticality and its use in management of tasks.

The detailed paper for publication was distributed to attendees.
Peter Wilson from the Sydney Office of Mincom delivered a presentation on the relationship between CMMS functions and the development of maintenance strategies and plans using RCM principles.

Specifically, Peter discussed the forthcoming interface between Mincom's new Ellipse version and RCM Turbo.

Ellipse incorporates a new functional area called MSSS (Maintenance Strategy Support System), where data generated using RCM Turbo will reside. Similarly, MSSS will provide live data information back to RCM Turbo assessors for continuous improvement and performance review.

Mincom have long recognised the need for a strategy development methodology and have carefully thought out the implications. Often, when an 'interface' is discussed, all that is really meant is a data transfer mechanism. The Ellipse approach is far more than this. MSSS provides an opportunity for strategists to examine the success or otherwise of their newly developed schedules over time. Are there failure modes yet to be addressed within the new plans? Are there tasks that have been put in place which do not predict or prevent failure to the satisfaction of the business?

In summary:

**RCM modelling tools (RCM Turbo):**

- Determine Functional Criticality.
- Analyse Failure Modes & Effects.
- Risk Management.
- Determine a cost effective Strategy.

**CMMS Systems**

- Manage RCM Strategies.
- Collect RCM data.
Report the results of RCM analysis.