STRATEGIC ANNUAL RELIABILITY CONFERENCE REPORT - 2004

Once again, we were pleased to welcome a group of respected maintenance professionals, presenting on a range of reliability topics.

The Powerpoint versions of each paper have been circulated to Users on the recent version 9.5 release disks for RCM Turbo and SOS.

Anyone wishing to obtain a CD-ROM containing these (and prior year) papers may contact chris.kelly@strategicorp.com.

We have clients in the following industries:

- Alumina and Aluminium related
- Brewing Companies
- Chemical Companies
- Fertilizer Plants
- Food Industry
- Professional Maintenance Services
- Mining Companies
- Petro-Chemical
- Pharmaceutical Companies
- Power Distribution & Transmission
- Power Generation
- Process Plants and other
- Pulp & Paper related
- Water and Waste Water

RAY BEEBE - MONASH UNIVERSITY

OFF CAMPUS LEARNING FOR MRE

Maintenance and reliability engineering topics are rarely contained in engineering degrees. Fortunately, they are available by postgraduate study, and many hundreds of engineers and senior technical people have completed them. Off campus learning is the only practical way of presentation, and starting in the mid-1980s, Monash University has continually redeveloped its programs. When Ray joined Monash after 28 years in power generation, these programs consisted of two awards. There are now four, peaking at master's degree, which can also be reached by students who start without holding a degree. Ray will explain the Monash approach, especially how web-enhanced delivery is being developed and used.
LEN BRADSHAW - ENGINEERING - PUBLISHER AND EDITOR, THE MAINTENANCE JOURNAL

Len is a specialist in maintenance and control and an international consultant in this field. He has conducted over 220 courses for in excess of 6,500 maintenance personnel both in Australia and overseas. Len is Managing Editor of the Maintenance Journal. He has a Masters Degree in Terotechnology (Maintenance Management) and has held several positions as Maintenance Engineer in the UK and other overseas locations. He is the author of four texts on Maintenance Management. Len has conducted maintenance management courses for all levels of maintenance staff from trades personnel to executive management.

Are Improved Data Collection Systems Improving Maintenance Data Analysis?

An introduction to the improved data collection methods available with Computerised Maintenance Management Systems (CMMS). Do these improvements to the methods of data collection really help to improve Maintenance Data Analysis? What is wrong with our current use of maintenance data and how can we better accumulate data for maintenance decision making and analysis.

RAY BEEBE - MONASH UNIVERSITY

Following 28 years in power generation, Ray joined Monash University. He is now full-time teaching and co-ordinating the postgraduate courses in maintenance management and reliability engineering that are run by distance education.

Ray has been deeply involved with condition monitoring development, application and training in Australia and overseas since 1966. His training notes evolved into his book, Machine Condition Monitoring, and led to running over 50 public courses.

He has written over 55 papers for conferences and journals. Ray has consulted to over 35 customers.

Ray is a Chartered Professional Engineer and a Fellow of the Institution of Engineers, Australia. He is Chair of the Gippsland Chapter of the Maintenance Engineering Society (MESA), and was also a Founder Fellow of the Institution of Diagnostic Engineers.

USE PdM TO OPTIMIZE OVERHAULS ON PUMPS

Pumps are arguably the most common machine in power and process industry, yet relatively little information is available on the application of predictive maintenance/condition monitoring. When deterioration in performance of a centrifugal pump causes a drop in plant production, overhaul is readily justified, as its cost is usually small in proportion. When the effect of deterioration is only to increase power consumption, the time to overhaul for minimum cost can be calculated from test results. Some basic condition monitoring tests for pumps are described. Ray shows how to use these condition monitoring methods to estimate the increased power consumption caused by pump wear. A case study included shows how application of condition monitoring by vibration analysis and performance analysis on a pump solved some problems. (Paper originally presented at Process and Power Plant Reliability Conference, Houston Nov 2002, and published in HYDROCARBON PROCESSING. Led to invitation to write Ray's second book, Predictive maintenance of pumps using condition monitoring).
**Steve Lindborg - Chemical Lime Corporation - USA**

Steve Lindborg is the Director of Maintenance Engineering for Chemical Lime Corp, part of the Lhoist Group. Lhoist is one of the world's largest private companies, with over 7000 employees.

**Writing the perfect PM.**

This presentation talks about what should be described in a PM task. How to use an RCM methodology (RCM Turbo) to insure a timely and efficient outcome. Chemical Lime has developed a library of PM's with like and unique pieces of equipment. Results and outcomes were discussed.

Steve spent some time discussing Key Performance Indicators and measurements of effectiveness as defined within Lhoist.

In defining the 'perfect PM', Steve emphasised the issue of **task effectiveness. He went on to define 15 elements that are considered** necessary to create task lists that will be effective.

**RCM Turbo outcomes to date include:**

- More structured and timely PM's
- 200,000 tons of added capacity
- 97% Reliability on US kilns
- PM plans for future acquisitions
- Focused approach to new PM's and equipment
- Cross fertilization of FMEA's
- Consistency throughout the all Lhoist
- Tool for FAT teams

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**Soren Neilsen - Novo Nordisk Denmark**

**RCM Value analysis on Air Compressors**

NNE is a consulting and engineering company, which over many years has developed experience and unique knowledge which makes it a leading vendor of plant, consulting and engineering services to the pharmaceutical and biological industry.

Soren commenced by explaining the concepts of lean manufacturing. He went on to explore the links between TPM and RCM (Turbo).

In developing strategies to increase equipment availability, Soren outlined a series of activities including root cause analysis, necessary design changes highlighted in the RCM Turbo assessment and the 'people' issues associated with these activities.

The NNE approach is to conduct focussed workshops to impart important principles to attendees. These were combined TPM/RCM workshops. The 'nuts and bolts' of failure mode assessment, proper description of tasks, spare parts issues, working procedures and other issues are covered.

The NNE workshops define the intrinsic link between business issues and maintenance activity (an approach which also defines the RCM Turbo process).
Bent Norgaard - COWI Denmark

Major Client Experience from Denmark

RCM Turbo has been applied extensively at a world renowned manufacturing facility in Denmark. COWI represents Strategic methodologies in Denmark and Bent's presentation outlined progress and outcomes from this application.

COWI is a world wide organisation with over 3000 employees (over 1400 of whom are located outside of Denmark).

Bent discussed the combined RCM Turbo / TPM implementation at this well known facility. The goals defined here were:

- Maximum efficiency with in total production (OEE)
- Establish systems that can prevent losses “zero failure”, “zero – defect”, ----
- Clean, neat and safe workplace
- Creating work place ownership
- Involvement of the whole organization through team building
- Change from a “PUSH” to “PULL” culture
- Reduce maintenance cost by 30%

Bent went through the elements of a TPM /RCM approach, including a 'pilot' approach using these methodologies.

Pilot outcomes included:

- 87.5% of the resources now applied for planned maintenance as opposed to 15% previously
- 12.5% applied for emergency repairs against 75% previously
- Planned maintenance conducted in task packages at shorter intervals than previously and for a large part as CBM
- Operators more involved in the maintenance, the ratio being 27% against the share of repairmen and electricians of 73%
- 10 – 15% of the FM's recognized as Design change related
- The above implies a saving potential of 51.5% in total
- Saving potential of approximately 40% of the inventory using SOS
Strategic Corporate Assessments is a privately held company with two strategic regional headquarters based in Australia and North America.

Our products were originally developed by a $20 billion company for its own use and then acquired by Strategic, commercialized and enhanced, since then we have been delivering results of excellence to clients like you, worldwide.

We can do this by providing the world’s best and most unique sets of optimization tools, techniques, methodologies and if required, services. Strategic’s powerful, expert knowledge-based decision support systems are both inexpensive and easy to implement.

**Craig Webb - Honeywell Automation & Control Systems**

Real time usage of RCM Turbo outputs

Craig will outline the technologies Honeywell promotes to get real-time results out of the RCM Turbo analysis. A live system will be demonstrated and will include gathering field data from a wireless mobile terminal, right through to Secondary Action (planned repair) initiation in a CMMS by applying RCM Turbo outcomes in real time.

Main benefits are a more focussed outcome from the RCM analysis particularly with respect to warning effects (SAI) and recommended response actions.

Managing assets in real time by their failure modes also allows you to see the accuracy of the assumptions you have made in your RCM analysis and allows reports to be automatically generated that will indicate to you the need to revisit your analysis.

Honeywell’s tools encourage use of RCM Turbo in a continuous improvement based manner making sure that users continue to receive benefits from RCM Turbo and reducing the potential for their interest/use to lapse.

**Greg Quilter - On behalf of WMC Fertilizers Phosphate Hill**

RCM Turbo implementation experience

Greg presented on a project based approach to maintenance strategy review at WMC Corporation’s Phosphate Hill operation near Mt Isa in Queensland. In conjunction with WMC’s Shane Calnon, this presentation examined the process, issues that have arisen both good and to be avoided, as well as outcomes achieved.

Greg and Shane went through actual RCM Turbo assessment data, together with photographic support material.

The presentation was very well received, so much so that the session had to be extended.
S. Bradley Petersen - President, Strategic Asset Management Inc

Brad Peterson is the founder and principal owner of Strategic Asset Management Inc.(SAMI). His motivation in starting SAMI was his belief that maintenance consulting achieved less success than was possible, and believed a new approach was necessary. In addition, he understood that the highest level of performance in managing assets was possible and this process needed to be articulated. Development of these concepts has led SAMI to become the world leader in Asset Management consulting.

A Plan for Operational Excellence

Many top global manufacturing companies are beginning to focus on the idea of "Operational Excellence". Is this another quality movement, without focus or specific deliverables? Is it a Six Sigma approach to train black-belts and go after cost reductions? Do we understand what "Operational Excellence" is, and how it may be achieved?

Strategic Asset Management is a proven model for gaining both continuous improvement and step-change across all facets of the manufacturing process. Encompassing new construction, production, asset healthcare and logistics, this integrated approach gives definition and dimension on Operational Excellence. Incorporating Change Management, Functional Excellence Models and Leadership practices, the SAM model provides a guidebook for those companies looking for practical and systematic approach to practical and measurable change.

REG TAYLOR and CHRIS TROUTMAN - Hatch Consulting

Maintenance Strategy Development for non rotating equipment

Applying reliability principles to fixed assets such as bridges, dams, pipes etc has generated considerable discussion in terms of its true applicability. Reg and Chris reported on their experiences in this type of assessment.

Hatch have successfully completed condition assessments of four road bridges on behalf of NSW RTA. The drivers for carrying out these assessments are as follows:

- Ensure ongoing Reliability
- Criticality high - eg Spill traffic issues
- Historical significance
- Need to understand condition
- Budgeting
- Adopting new Technology

Some of the outcomes and deliverables included new, ten year plans with clearly defined tasks and intervals, addressing both safety and operational issues.