STRATEGIC ANNUAL RELIABILITY CONFERENCE REPORT - 2006

A large international gathering of users and industry experts met up in Manly during February 2006 for another successful conference.

If you would like to download any of the supporting Powerpoint presentations, please email chris.kelly@strategicorp.com to obtain a password.

Included in this report is a summary of the papers presented

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

BRIAN COFFIN - COORS BREWING GOLDEN COLORADO

MANAGING ASSET INSTALLATION—BREWING A SUSTAINING RELIABILITY STRATEGY

The case study focused on the front-end work required to establish a reliability strategy for a new brewery. The presentation covered the following subjects:

- Why being proactive in managing assets is important to business success.
- Life Cycle Costs (total installed cost vs. total cost of ownership).
- Process for managing new assets (including the use of RCM Turbo).
- Lessons learned
RAY BEEBE - MONASH UNIVERSITY

Following 28 years in power generation, Ray joined Monash University. He is now full-time teaching and co-coordinating 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.

STEAM TURBINES—CASE STUDIES IN CONDITION MONITORING

Blade deposits, blade damage, internal piping failures, external joint leakage, main strainer blocking, N2 gland leakage on HP-IP turbine casings; high vibration from incorrect transducer mounting, resonant whirl in generator bearings, casing deflection, shaft rubbing:

Ray Beebe has seen them all on these major machines. He showed how information from condition monitoring can help the maintenance decision: to open a turbine only where there is a technically and economically compelling reason. Some machines have run 17 years before opening.

20 YEARS OF MRE PROGRAMS

The Monash off campus learning programs in maintenance and reliability engineering are now in their 21st year. Ray Beebe was one industry representative for the formal approval of these programs, developed by Len Bradshaw. Ray never imagined that he would become an academic and later Co-ordinator of the programs for 10 years! Ray will describe the programs today and their development into web-based learning. In 2005, there were 150 students from 14 countries, with most from Australia, but 37 in North America.

LINDSAY TONKIN – ABB AUSTRALIA

RCM TURBO PILOT STUDY AT MITSUBISHI MOTORS

The new Main Shuttle Station MS4 was designed for the new 380, 2006 model Mitsubishi Magna. The Main Shuttle is the body weld assembly line being a criticality A part of the plant. The station was designed and built by Mitsubishi Japan with the robots being Kawasakis. It consists of six robots with spot weld guns, a main fixture jig with two body side jigs each with spot weld guns, and transformer controllers. It is a complex plant with many maintainable items.
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.

**HOW CAN YOU USE FAILURE DATA?**

A light hearted look at the different ways you may use and display failure data including:

- What MTBF can and cannot do.
- Examples of displaying reliability and maintainability data.
- Timelines, to histograms, to failure analysis and to simulation via a case study.
Dan Oliver – Tennessee Valley Authority

Dan was General Manager Materials Management for all of the Tennessee Valley Authority, with 35 years experience in developing, implementing and managing supply chain functions including:

**MAINTENANCE SPARES OPTIMISATION – ALL THE ISSUES**

**BENCHMARKING**
- Internal and external
- Within industry or outside industry
- Assess opportunities for industry best practices
- Compare your performance with data currently on hand

**BILL OF MATERIAL (BOM)**
- Develop BOM based on current inventory of spare parts
- Develop based on OEM spare part recommendation

**INVENTORY DATA ANALYSIS**
- Identify potential overstock and under stock situations
- Identify inventory reduction opportunities
- Improve cash flow
- Identify internal shared inventory opportunities
- Develop key performance indicators and goals
- Identify Reverse Engineering opportunities
- Identify external pooled inventory opportunities
- Identify best algorithms and implement as appropriate

**PHYSICAL INVENTORY**
- Complete warehouse management and storage assessment
- Perform Physical inventory (On hand vs. on books)
- Identify shelf life and Preventative maintenance requirements
- Perform inventory rationalization

**SUPPLIER MANAGED INVENTORY (SMI)**
- Identify candidates for SMI
- Identify suppliers
- Complete implementation of SMI program

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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.

INVESTMENT RECOVERY (IR)
- Identify IR opportunities
- Identify best return on investment
- Establish IR process

WAREHOUSING
- Perform assessment of storage facilities
- Set up complete process including; receiving, issuing/sales, storage, stock rotation, inspections, physical inventory and safety analysis

MATERIAL STANDARDIZATION
- Identify candidates for savings
- Identify best sources for products
- Set up standardization program

TRANSPORTATION AND LOGISTICS
- Identify most cost effective transportation inbound and outbound
- Assist with program setup to manage transportation

PROCEDURE DEVELOPMENT
- Perform procedure assessment
- Develop or revise current procedures for total Supply Chain Control
- Inventory
- Warehousing and storage control
- Receipt inspection
- Investment Recovery
- Preventative maintenance
- Shelf life program
- Nuclear Supply Chain
- Sarbanes Oxley controls
DETERMINATION OF FAILURE HISTORY THROUGH CMMS RECORDS

This paper described the analysis of work order history data obtained from computerised maintenance management systems for the purposes of improving PM strategies, advising on operator utilisation of the equipment and noting where design improvement is warranted.

The analysis is encapsulated in a software program and is independent of the commercial work management system and consequent database structure. What this work has shown is that with few exceptions, the designers of the current more widely used systems have conformed to a similar logical approach to the functionality and data requirements for maintenance work control. This allows the generic approach adopted in this method and demonstrates the de facto standards which now exist in maintenance management software.

The paper will describe how the failure modes present in the equipment and systems can be determined in a robust way which is independent of fault codes and other codification schemes which are often not well followed by the field staff. To complete the cycle from first analysis to detailed recommendations on maintenance and operator improvement is challenging, and this work has further attempted to achieve this with a minimum amount of human intervention reviewing each of the thousands of work orders which make up a normal sized work order history for a modern facility.

Examples are provided of the output and how these may be used to achieve practical improvement, and discussion of the limitations of the current methodology point to the next steps in the research.

HATCH E-INSPECTOR TM:

Steve discussed Hatch’s e-Inspector approach, a leading edge inspection method with unlimited applications. The utilisation of Pocket PC technology enables electronic on-site data collection, overcoming the hurdle of turning paper based check-sheets into productive data analysis, with customised data analysis available as required.

The reporting module of e-Inspector is easily customised to suit the desired analytical output.

HATCH RELIABILITY WALKS TM - "INSPECTION EFFECTIVENESS" A CASE STUDY

An initiative that facilitates improvement in inspection effectiveness and therefore improved reliability of plant and equipment.

Eighteen were conducted to ascertain levels of inspection effectiveness. The Reliability Walk is also an opportunity to set expectations and target areas for improvement.
CHRIS MORRISON – ARNOTTS
AUSTRALIA
OEE STUDY AND OUTCOMES AT ARNOTTS

Chris has completed a comprehensive study of OEE for Arnotts in Australia.

His presentation provided an overview of Arnott's and its need for a common productivity metric, the reason for choosing OEE, the development of the metric for the business with a definition of how OEE is calculated and then an implementation summary on how it was rolled out across the sites. Finally he demonstrated how OEE is now used in the business for communication and decision making.

ADAM VAN DYCK – CCI POPE

BENEFITS OF 'BEST PRACTICE' CONDITION MONITORING DATA MANAGEMENT

Many organizations struggle to unlock the true potential of their condition monitoring data. This data is not easily accessible across the organization and searching through condition monitoring reports is often a time consuming manual process. In many cases, seeing the "bigger picture" of overall plant health is virtually impossible to see.

Short term benefits are immediately realised when organizations adopt a best practice approach to condition monitoring data management. These organizations have the ability to quickly and easily search for condition monitoring information across the organization for any asset. An instantly accessible and exhaustive condition monitoring history for each asset is available. Potential problem areas are communicated to the relevant personnel immediately and overall plant health can be easily determined at any point in time. Over the longer term, these organizations are able to extract an extra layer of value from their condition monitoring data management systems. This may include benchmarking the health of similar assets across the organization as well as identifying those assets where predictive maintenance may be ineffective.

In this presentation, Adam discussed in detail the benefits that can be realised by adopting a best practice approach to managing

MR RICK SCHAFFER – FEDERAL BUREAU OF INVESTIGATION USA

PLANT SITE AND OTHER SECURITY ISSUES

Rick’s presentation gave insight into the increasing demand from large industrial clients seeking some form of additional reliability to "Harden" their assets as Targets in the New World Order or the Post 911 world

Rick has extensive experience both in terrorism related issues for a range of infrastructures such as port facilities, shopping malls, chemical plants, power plants and distributed assets such as metropolitan water systems and transportation systems as well as transmission and distribution assets for power companies and even security facilitation for small nations.
Expert Decision Support Methodologies to improve reliability AND reduce costs
UTILIZING OUR 21st CENTURY RAPID DEPLOYMENT RELIABILITY PROCESSES

ASSET CARE OPTIMIZATION FOR THE NEW MILLENNIUM