

2007 Reliability & Maintenance Conference Workshop Descriptions

Track 1: Cultural Change

Wednesday May 23, 10:00 am

Building Cultures of Reliability-in-Action

Brian Becker, Operating Practices Manager, BP

Darryl Bertram, Texas City Refinery Maintenance Manager, Reliability Management Group (RMG)

During this workshop, attendees will be asked to share examples of less than effective implementations and hidden bottlenecks from their own experience. From those examples, a common dictionary of terms will be assembled and used to build a model of organizational behavior. Workshop attendees will gain insight into cultures-in-action and how human reasoning drives effective and ineffective behavior. From a common understanding of "cultures-in-action", functional, actionable tools will be defined, and attendees will be shown how to use those tools to build cultures-of-reliability in their organizations.

Wednesday May 23, 1:15 p.m.

Breaking the Barriers of Traditional Learning

Bobby Vichich, VP of Turnaround Services, Asset Performance Networks

Joe Gandolfo, Turnaround Director - Americas, Shell Oil

Organizational learning is an important component in present day manufacturing. Companies who are able to diagnose and share opportunities effectively can be leverage learning as a competitive business advantage. Traditional learning tends to be a single-dimensional approach that, at best, could improve the execution of the next similar event falling short of permanently influencing and changing corporate knowledge, systems, processes, and behaviors. The authors will contrast this approach against a practice of continual diagnostics and systemic learning and offer case studies and practical examples that define it as a foundational condition for establishing sustainable excellence. The study introduces 'Double Loop Learning' - a methodology that drives preparation efforts and enable a high level of readiness required to successfully execute highly complex turnaround.

Wednesday May 23, 2:45 p.m.

A Case Study in Effectively Implementing Corporate Change Initiatives

Lance McPhail, Staff Engineer - Maintenance, Motiva Enterprises

Mike Salario, Engineering Excellence Manager, Motiva Enterprises

Tony Cardella, VP – Business Development, The Manufacturing Game

In today's world, more and more corporations are developing an integrated set of best practices to apply corporate wide. Thus far the implementation is proving to be far more difficult than development. At Motiva's Convent Refinery, we were asked to execute Shell Global Solution's set of maintenance best practices which is called GAME-ME.

After using traditional implementation approaches with limited success, in an on-going process we are discovering a set of implementation best practices for corporate initiatives. Our presentation will focus on our latest understanding of implementation best practices and the impact this has had on our refinery and its employees.

Thursday May 24, 10:00 am

Creating and Sustaining Reliability Culture

Ramesh Gulati, Asset Management and Reliability Planning Manager, Arnold Engineering Test Facility - US Air Force

Many RCM/Reliability programs fail or never get implemented. This workshop will describe the common obstacles to a successful implementation and what it takes to overcome them including: availability of good-quality data and information; the right metrics to measure the effectiveness; and creation of a culture conducive to implementing a reliability culture.

Thursday May 24, 2:45 p.m.

Human Reliability and Gray Matter(s)

Jim Stephanou, Vice President, POSM Global Assets, Bayer Corporation

The Gray Zone is when most accidents and reliability issues (not only in the chemical industry, but in many other industries) occur. The key issue is to be able to reflect on these many significant incidents, develop a culture to recognize, avoid, and exit the Gray Zone when these situations arise. The need for this critical thinking and a total safety and reliability culture is essential with more process automation, and production increasing demands in this mature industry. This presentation examines many interesting incidents and provides an interactive presentation and training session with a common understanding of the root cause and the need for Gray Matter(s). Many accidents and reliability issues will end in a root cause of people operating or ending up in a Gray Zone and hence as a mitigating approach, using more Gray Matter as the final corrective action

2007 Reliability & Maintenance Conference Workshop Descriptions

Track 2: Principles & Practices **Wednesday May 23, 10:00 am**

What's New in API/ASME Inspection/Repair Standards

John Reynolds, Shell Global Solutions (retired)

Roland Goodman, SCI Staff, American Petroleum Institute (API)

Ray Konet, Principal, Lajaime

John O'Brien, Reliability Specialist, Chevron

This workshop will present a panel discussion of four industry representatives who have been extensively involved in the creation and updating of API and ASME Inspection and Repair Standards. They will discuss recent changes in those standards (both new and updated) and what impact they will likely have on the refining and petrochemical industries.

Wednesday May 23, 2:45 p.m.

NDE Techniques and their Applications in Processing Facilities

Ashok Rakhe, Engineering Associate, Celanese Chemical

Determining the "real" condition of a piece of equipment is a question that is always on the mind of process equipment inspectors. Non-destructive techniques offer a "behind the curtains" view of the equipment. The techniques include a whole range of simple (dye penetrant examination) to difficult (eddy current and ultrasonic examination) to complex (acoustic examination) technologies. This paper briefly explains the basic principles of some of the commonly available techniques and provides guidance in selection of the most effective technique in a given application by citing case histories.

Thursday May 24, 10:00 am

Rethinking the Industrial Plant Maintenance Model Utilizing Conventional RCM Theory

Paul Ring, Vice President, CH2M HILL

An effective industrial maintenance program is the result of a well thought-out, articulate process that if done properly, is not only more effective, but also more simple. By applying key elements of reliability centered maintenance, an effective maintenance program can be synthesized that provides the best reliability while balancing life-cycle costs, production output, and foremost of all safety.

Thursday May 24, 2:45 p.m.

Obtaining Leak Free Bolted Joint Operation by Returning to Basics

Warren Brown, Principal Engineer, The Equity Engineering Group

Wayne McKenzie, Manager, Turnarounds, Syncrude Canada

Shane Ryan, Lead Maintenance Engineer, Syncrude Canada

Leakage of pressure vessel and piping bolted joints in refineries is an unnecessary hazard, with high associated costs, that can be easily rectified using currently available technology. There have been advances in gasket testing technology in recent years that have allowed great improvements to be made in the specification of gaskets for refinery applications. This minimizes the likelihood of joint leakage and results in reduced operating cost. In addition, there have also been advances in joint assembly procedures that have enabled significant reduction in joint assembly times, while resulting in a better final gasket stress distribution and therefore lower likelihood of leakage. This paper outlines a simple basis for justification of the implementation of improved joint and bolting technology in the refinery. It also details the critical calculation methods, assembly procedures and actions required to ensure leak free operation and ways of providing on-going quality assurance to a refinery leak-free program. An example of the recent implementation of a leak-free program in a refinery unit is followed in order to provide clarity on the required steps to achieve leak free operation.

2007 Reliability & Maintenance Conference Workshop Descriptions

Track 3: Procurement

Wednesday May 23, 10:00 am

Global Valve Sourcing: Valve Acceptance Criteria for AML Development and Implementation

Kenneth Felder, Material Master Manager, Strategic Sourcing, Valero Energy Corporation

Robert Smith, Director of Safety and Quality Management, McJunkin Corporation

Gary Ittner, Senior Vice President, McJunkin Corporation

Greg Johnson, President and CEO, United Valve

This panel will discuss the process of developing an Approved Manufacturers List (AML) which utilizes best in class resources to evaluate quality and industry trends for acceptance on the AML. The panel will address shop inspection, variability of production, API recommended practices for testing methods used to evaluate the quality of the product which is ultimately accepted or rejected by the operating company.

Wednesday May 23, 1:15 p.m.

Discussion

Wednesday May 23, 2:45 p.m.

Moving From Traditional To Risk-Based Spare Parts Inventory

Cesar Malpica, Reliability Specialist Consultant, Petrolera Ameriven

Hernando Gomez de la Vega, Strategic Business Director, Reliability & Risk Management

Nage Moummar, Materials and Contract Superintendent, ConocoPhillips

Increase or maintain the On Stream Factor for all facilities is always the target for all organizations in a company. However, some decisions taken without the proper attention by Management become in the main reason to never reach such goal. One of this decision is the identification of spare items to be stocked (warehouse) and how many of such items should be maintained to assure that operations are not affected but also, that business get the highest return on the investment.

Gut Feeling, old hand experts opinion and manufacturer recommendation are typically the main source of reasons to decide what to be stocked. Operations want plenty of spare parts however, it fails to match both the business and production needs.

A risk based approach considering the simulation of stochastic demand of critical items arise as the road to be followed. Expected rate of demand (reliability / MTBF), operational impact if the spare for a damaged part is not available, delivery time, material & administration costs and finance goals should be integrated.

Well documented projects have demonstrated, if traditional approach is followed up to 50% of items recommended for warehouse as spare parts are not really needed. But also, such traditional approach fails to identify up to 50% of the items that must be

stocked to assure the fast response under emergency and to expedite the planning of maintenance.

Thursday May 24, 10:00 am

Inclusion of Diverse Suppliers Into the Supply Chain

Nancy Swartout, Manager Global Supplier Diversity, ExxonMobil Global Services Company

The workshop will include a discussion of how and why inclusion of Minority and Woman Business Enterprises (MWBE) into the Oil & Gas corporations' supply chain is important. We will discuss how this is achieved and how to drive growth of inclusion programs. Tools, techniques and best practices in the area of supplier diversity will be examined. Finally we will discuss the significant role that oil & gas Prime Suppliers can play in the development of MWBE suppliers.

Thursday May 24, 2:45 p.m.

Redefining the Buyer-Supplier Balance of Power

Alicia Dickerson, Director, Procurement Strategy Council, The Corporate Executive Board

Customer of Choice status with suppliers is critical to ensuring priority treatment when suppliers allocate scarce resources. Additionally, Customer of Choice status takes into account how to capture and harness supplier innovations by understanding their cost to serve you as a customer and how to leverage aspects of your market power to help improve supplier relationships.

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Track 4: Reliability I (General)

Wednesday May 23, 10:00 am

OEM vs. Independent Re-Build Shops: Why Having all the Facts and Keeping an Open Mind is Essential

Heinz Bloch, Consulting Engineer, Process Machinery Consulting

Jim Steiger, Senior Aftermarket Engineer, HydroAire

Bob Bluse, President, Pump Services Consulting

Rebuilding a vintage pump to original equipment manufacturer's specifications is inappropriate in the numerous situations where upgrading yields significant reliability improvement and operational savings. This workshop addresses the "how, where, and when" of these opportunities and gives both tangible guidelines and several recent examples of interest. Critical and important aspects of vendor-user interaction are delineated.

Wednesday May 23, 2:45 p.m.

Assessing the Value Creation of RBI

John Aller, President, Lloyd's Register Capstone

Karen Maxson, Senior Consulting Engineer, DuPont Engineering

"Reduction in Risk" (including the business risk of lost production) or "Cost Reductions". Cost reductions are generally easier to quantify and measure, but understanding and properly managing the risk generally provides greater value. Risk reduction is often considered a 'soft' number, and if an equipment failure is prevented it is difficult to take credit for the risk reduction.

This paper will describe how value generation can be predicted before the application of RBI, and how it can be measured during the implementation and sustaining of the process.

A value calculation tool will be demonstrated and made available to the attendees, and KPIs will be presented that will help any operating company be more successful in demonstrating the true value of the RBI program.

Thursday May 24, 10:00 am

New Concepts in Asset Reliability Management

Barry Snider, Owner/Manager, Snider Consulting

Over the past 30 years millions of dollars have been spent on programs such as RCM, TPM, RBI, RBM, Operator-driven Maintenance and Six Sigma. The next generation of ideas for managing reliability promises to go well beyond these commonly used, or misused, strategies to produce significant improvements in the overall performance of assets.

New concepts that will likely emerge as the next generation of reliability improvement strategies include Real-time Asset Management, Human Asset Reliability, Organizational Reliability, Competence Management and Failure-free Engineering.

Thursday May 24, 1:15 p.m.

The Ninety Nine Diseases of Pressure Equipment

John Reynolds, Shell Global Solutions (retired)

David Bryan, Maintenance Manager, Marathon Oil

Mark Geisenhoff, Fixed Equipment Manager, Flint Hills Resources

Clay Rodery, Technical Authority/Fixed Equipment, BP Products North America

Eddie Sanchez, Staff Reliability Engineer, Chevron

This workshop will be a panel discussion by four pressure equipment owner-users in the industry who will talk about safety and reliability incidents that have occurred at their facilities, how they investigated the incidents, their conclusions, and solutions to failures that caused the incidents.

Thursday May 24, 2:45 p.m.

Global Implementation of RBI within the Bayer Organization

Udo Pankoke, Manager Mechanical Integrity, Bayer Corporate and Business Services

James Feeney, Director Isocyanates Reliability, Bayer Material Science

Dr. Michael Renner, Process Technology, Head Materials Technology, Bayer Technology Services

Risk based inspection (RBI) has proven to be a safe and effective way to prioritize equipment inspections and associated maintenance activities and is recognized as a Best Practice within the Bayer organization. RBI also supports the global Bayer production goal of attaining longer intervals between major plant turnarounds. This paper describes the global efforts of Bayer to promote this methodology within the various subgroups and to support the acceptance of RBI by the different regulatory authorities in all regions of the world with major Bayer productions facilities.

2007 Reliability & Maintenance Conference Workshop Descriptions

Track 5: Reliability II (Technical)

Wednesday May 23, 10:00 am

The Bulging Intensity Factor

Mahmod Samman, Senior Associate, Stress Engineering Services

Pierre DuPlessis, Mechanical Engineering Manager, Sustaining Projects, Suncor Energy

The Bulging Intensity Factor is a new technique for analyzing bulging patterns in coke drums. It is used to identify, rank, and assess the severity of the areas that are most susceptible to cracking. This paper includes a review of the technical basis of the technique along with Suncor's experience of using it for forecasting cracks and developing repair alternatives.

Wednesday May 23, 2:45 p.m.

Importance of Gathering Start-up/Shut-down Vibration Data on Critical Turbo-machinery

Ed Wilcox, Consulting Machinery Engineer, Lyondell Chemical Company

This paper describes how transient vibration can be used to provide much more information about a piece of machinery than steady state data alone. Transient vibration data is defined as vibration data taken when the machinery starts-up or shuts-down (i.e. large changes in speed). Most of the machinery described is of the high speed nature with hydrodynamic journal bearings and non-contacting eddy current displacement probes, though many of the principles apply to low speed applications with anti-friction bearings as well. A brief description is given of the type of diagnostic equipment required to gather transient data. The different types of transient data plots are described along with the different insights they each provide. Likewise, several case studies are presented where transient data was used to evaluate the stability of the machinery as well as determine the source of the excitation forces. Another important benefit of transient data is that it provides a method of verifying machinery natural mode frequencies and rotor-dynamic models.

Thursday May 24, 10:15 am

Risk-Based Method to Establish Inspection Intervals for Pressure Relief Devices

Philip Henry, Principal Engineer, The Equity Engineering Group

Valerie Magvari, Senior Engineer, The Equity Engineering Group

Dana Baham, Mechanical Engineering and Inspection Superintendent, ConocoPhillips, Lake Charles Refinery

Properly functioning Pressure Relief Devices (PRDs) are essential to protect plant personnel and equipment, as unexpected overpressure events can cause equipment damage and loss of containment resulting in costly plant shutdowns. PRDs are considered to be the ultimate layer of protection of pressurized systems.

The inspection and testing of relief devices is needed to ensure PRD functionality on demand. But when and how often do you need to inspect? Many plants apply inspection intervals to PRDs in general agreement with API 510 and NBIC, without considering historical performance or the potential hazards associated with the relief valve application.

The new API PRD RBI technology provides a system approach (includes the damage state of the protected equipment) and evaluates the probability (reliability) and the consequence (criticality) of pressure relief valve failure and sets the appropriate inspection frequency based on risk.

A recent site-wide study has been conducted at the ConocoPhillips Alliance refinery demonstrating the benefits of the new approach. Compared to a typical API510 approach, the risk based plan can significantly reduce the overall risk in the plant at the same time, a significant reduction in inspection costs can be realized.

Thursday May 24, 1:15 p.m.

Identifying the PF Interval Made Simple: Establishing an Effective Preventive Maintenance Program

David Martin, Maintenance, Louisiana Offshore Oil Port (LOOP)

Ricky Smith, Reliability Strategy Leader, Ivara Corporation

We will discuss why equipment continues to break down even though a complex PM program is executed on the equipment. In this program you will be provided with proven tips and ideas which will result in a rapid increase in performance. The PF Interval for asset reliability will be discussed with an explanation as to what is it, how it should be applied, and why it has been misapplied. The discussion will lead to who is responsible for reliability of a refinery's assets (everyone) and why this is so important to the success of any reliable PM program. As the saying goes, "Reliability isn't just for Maintenance anymore". This is a guaranteed fun and fantastic learning experience with David Martin from Louisiana Offshore Oil Port and Ricky Smith a well known expert and author in the field of reliability.

Thursday May 24, 2:45 p.m.

Torsional Analysis of Rotating Equipment

Troy Feese, Senior Project Engineer, Engineering Dynamics

Torsional vibration involves the twisting and angular oscillation of shafting. Excessive torsional vibration can be caused when operating machinery near a torsional natural frequency. This can result in broken shafts, couplings, cracked gear teeth, etc. The classical indication of a torsional failure is a crack at 45 degrees across the shaft. For this reason, The American Petroleum Institute (API) standards recommend maintaining adequate separation margins between excitation mechanisms and the torsional natural frequencies of the system.

Torsional vibration problems continue to occur with machinery despite numerous books and technical papers on the subject. One area of concern is when variable speed motors are coupled with reciprocating machinery or machines with large inertias, such as fans and mixers. Other causes of torsional vibration problems include improperly tuned engine cylinders, excessive pulsation in pump and compressor cylinders, improper selection of coupling and flywheel, and not maintaining torsional dampers. The purpose of this presentation is to raise awareness of torsional vibration, and to give guidelines for avoiding problems. The need for comprehensive torsional vibration analysis in the design stage and for measurements during commissioning of critical equipment is discussed. Several case histories are presented in which the failures were primarily due to torsional vibration. The final solutions are given for these cases to demonstrate typical corrective action.

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Track 6: Turnarounds

Wednesday May 23, 10:00 am

Standardizing and Improving Best Practices in Estimating and Planning

Bernard Ertl, Vice President, InterPlan Systems

Buddy Jacks, President, Industrial Planning Consultants

Explore research on inconsistent planning quality, problems inherent in the manual or static template based approach to capturing and improving best practices and solutions to some of the common problems.

Wednesday May 23, 2:45 p.m.

Successfully Integrating Capital Projects With Plant Turnarounds - Lessons Learned and Strategies for Pacesetter Results

Bobby Singh, President, Project Assurance

Mike Uremovich, Chief Executive Officer, Starcon International

Mark Estep, Maintenance Manager, Marathon Petroleum

Joe Luciano, Turnaround and Construction Manager, Shell

Owner, contractor and consultant will share the lessons learnt and present innovative strategies and pragmatic solutions to ensure successful integration of capital projects with turnarounds in order to achieve pacesetter results.

Thursday May 24, 10:00 am

How to Consistently Have Successful Turnarounds

David Garbade, Senior Consultant, CITGO Petroleum

In 2004, CITGO's Center of Excellence Turnaround Team examined its refineries' performances on turnarounds over the 3-year period of 2000 – 2002. While the average final cost of the turnarounds was only 4% over the budgeted costs, the actual cost for 37 of the 56 turnarounds fell outside of the $\pm 10\%$ target range. The Turnaround Team's challenge was to develop a "Process" that could produce more consistent and reproducible results. This paper describes how the Turnaround Team developed a list of all the things that historically have caused turnarounds to fail and then developed a process to prevent/mitigate every identified type of failure. The "Process" that was developed was a unique type of Stage-Gated Process, with "teeth" in it, which eliminates excuses for failures. It is simple, practical, and effective.

Thursday May 24, 1:15 p.m.

Turnaround Durations: The New Reality

Bill Van Winkle, VP Operations, The Turnaround Management

The vast majority of the industry has been working extensively for more than 20 years to shorten turnaround durations and meet Solomon first quartile metrics. During this time, many improvement initiatives have been implemented for the right reasons; however,

combined with factors outside of our control have created the perfect storm, ultimately driving durations in the opposite direction of Solomon first quartile.

Thursday May 24, 2:45 p.m.

Panel Discussion - Turnaround Performance

Roddy Caffey, Maintenance Manager, Alon

David Garbade, Senior Consultant, CITGO Petroleum

Jim Lanclos, Senior Manager, JV Industrial Companies

Dave Park, Turnaround Process Manager, Lyondell Chemical

David Yeats, Maintenance Superintendent, TOTAL Petrochemical

2007 Reliability & Maintenance Conference Workshop Descriptions

Track 7: Work Process Improvement

Wednesday May 23, 10:00 am

Asset Management in the Arabian Gulf

James Davis, Managing Director SAMI Arabia, SAMI Middle East

Mubarak Rabea Al-Ahmadi, Manager of Asset Management, MARAFIQ

In the last few years many industrial companies in the Arabian Gulf and Gulf Cooperation Council (GCC) have begun to realize the importance of Strategic Asset Management (SAM) as an enterprise strategy that, properly implemented, will result in Sustained Business Performance Improvement (SBPI). One of these companies is MARAFIQ, the Power and Water Utility for Jubail and Yanbu. The cumulative gross benefits identified are SR 89.8 MM in efficiency gains and SR 31.5 MM in effectiveness gains.

Wednesday May 23, 1:15 p.m.

Gulf Coast Workforce Development Initiative and Beyond

Timothy Horst, President, Becon Construction

Ed Allison, Site Engineering Manager, DuPont

Don Whyte, President, NCCER

The Gulf Coast hurricanes of 2005 devastated the region with unparalleled destruction and hardships and magnified the shortage of skilled craft professionals to crisis proportions. The Business Roundtable, working together with an unprecedented group of representatives from industry, government and academia, created the Gulf Coast Workforce Development Initiative to help curb the growing workforce crisis in the region. The workshop will provide an overview of the initiative, its successes and the challenges that lie ahead. In addition, the presenters will discuss other owner and industry strategies and resources that are emerging to help combat our critical workforce challenges.

Wednesday, May 23, 2:45 p.m.

Six Sigma in Maintenance

William Turner, Manager of Operations, Jacobs Industrial Services

Some organizations view Six Sigma as merely a rigorous application of the basic and advanced statistical tools throughout an organization. There are a number of Six Sigma programs that are simply repackaged statistical components of previous Total Quality Management, Reliability Centered Maintenance, Total Productive Maintenance, etc., initiatives and renamed them "Six Sigma." It is, however, much more than just a revamped old initiative. To be effective Six Sigma must be more than the simple repackaging of old programs. This discussion outlines the similarities between the past programs and Six Sigma with emphasis on the implementation of the tools and processes

required for success. Particular attention is made to Root Cause Analysis, Failure Mode and Effects Analysis, and Risk Analysis and their application in the process.

Thursday May 24, 10:00 am

Operating with Integrity

Martin Hinchliffe, Operations Excellence Advisor, BP

Peter Elliot, Head of Integrity Management, BP

Safety performance in BP made sustainable improvement during the 90s and the early part of 2000 dropping from a DAFWAC of 1.2 in 1990 to 0.08 in 2004. A similar improvement in process safety and integrity management has not been seen, culminating in a series of serious incidents ranging from an explosion in the Texas City Refinery in 2005 killing 15 people, almost losing the Thunderhorse deepwater production platform in the Gulf of Mexico, and a significant oil spill in Alaska. Learnings from these incidents identified the need for a more consistent and systematic approach to understanding and mitigating integrity risks. This paper provides details of these incidents, and relates how BP has put systems and processes in places to prevent any such similar incidents happening again across the company.

Thursday May 24, 2:45 p.m.

Driving Performance Improvement within the Maintenance Organization

Kevin McQuillan, Teesside Engineering Manager, SABIC UK Petrochemicals

Daren Smith, IMS Manager, SABIC UK Petrochemicals

Modern manufacturing organizations can compete in international markets only if they can deliver simultaneous increases in plant output and reductions in controllable costs. Maintenance organizations can make significant contributions to these objectives; however in many cases short term focus on fixed cost reductions undermines the ability of the organization to deliver sustainable long term benefit.

The paper examines the role of benchmarking in setting performance targets, and also describes the development and use of key performance indicators to drive performance and monitor improvement. The paper addresses design of the maintenance organisation, the insourcing and outsourcing of maintenance work, and methods to improve productivity, using examples and data from the Huntsman Teesside plants as illustration.