

COE, Executives, Managers, Engineers and Businesses who want
productive, problem-free industrial and manufacturing assets

Foundations and Strategy for Engineering Asset Management Excellence

Three days where you discover the little understood facts, the critically important details and the necessary requirements that get best-in-class plant availability, production costs and throughput

What makes the big difference in performance and profit of world-class operation? How do you make your plant and equipment run consistently at highest availability? How do you produce at full capacity with 100% first-pass-quality? How do you generate the most operating profit and be sure to get it? It may surprise you to learn that there really are 'insider secrets' that the top operators use to get the plant and equipment performance that makes them best-in-class.

These 'insider secrets' make all the difference. The **Foundations and Strategy for Engineering Asset Management Excellence** training course introduces you to new facts and specific details that reduce production costs and wastes, give the utmost throughput, and make higher productivity inevitable.



With the right systems, the right methods and the right practices you can have:

- 100%-dependable full production,
- in-full-on-time delivery,
- continual first-pass quality product,
- sustained maximum throughput,
- no penalty claims,
- no breakdowns,
- non-stop highest plant availability,
- dramatically extended time between failures,
- extra production from your 'hidden factory'.

When you attend the course be prepared to discover new methods, practices and knowledge. Best-in-class producers know exactly what to do to keep productivity high and costs low. It takes a plan and it takes practice, but it is not difficult. You simply need to be doing the right things, rightly. This is where most operations (and most consultants) get lost – they do not know what is right and end-up focusing on the wrong things that bring no lasting value and improvement. You learn the critically important details you need to have in place, and in use. It will give you a clear appreciation of where to focus your efforts to get maximum results. You will come to understand exactly what to do and how.

Come and discover the solutions you need to the life-cycle issues affecting your operating plant and equipment performance. Learn simple, certain methods that produce the highest pay-offs from industrial and manufacturing plant and equipment. See how to involve and motivate your workforce to minimize your operating risks and maintenance problems while consistently producing maximum throughput. Know and understand how to make your plant and equipment truly reliable.

Reliability Fundamentals explains and helps you understanding what drives equipment reliability. It is full of critical concepts that you must master totally and fully understand if you want to get the most out of your operating plant's performance. Important issues, such as maximising series process reliability, reducing operating risk with chance reduction strategies and not consequence reduction strategies, grasping the implications of the 'physics of

failure’ when considering parts replacement, and when to proactively apply reliability engineering on your equipment.

Maintenance Management is more about operational risk management than machine maintenance. Learn when and how to apply the right strategy for your operating equipment. Learn how to develop an operational risk management model for your operation, from which you build your total and complete maintenance plans, actions, equipment monitoring and continual improvement strategies to create safely and surely the high reliability, low maintenance costs and full production you want. **(This is perhaps the most important document you will ever create in the operating life of your business.)**

Industrial Asset Management focuses on core ingredients to successfully build and run operations for high reliability and availability. Including understanding your plant life-cycle issues, identifying what systems and practices produce most benefit and motivating your workforce to produce great results. It combines all the reliability and maintenance knowledge of the previous two days into a lifetime strategy for your plant and equipment to make your business top-class (and keep it there). You will learn to apply all the plant and equipment health ‘insider secrets’ that make all the difference.

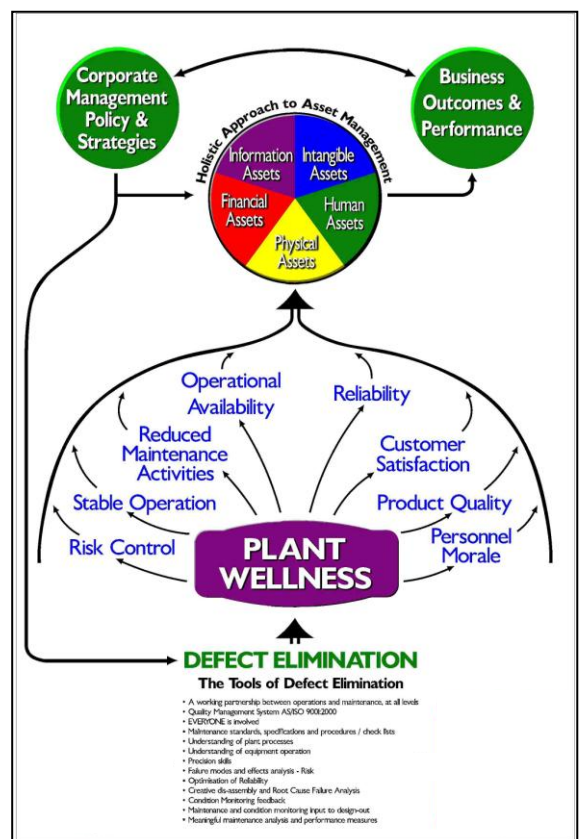
In the course you discover new, fast and sure ways to best-in-class operating productivity, plant and equipment reliability, and production asset performance, throughput and quality. You see what to do with your business processes and systems to create the reliability you want and exactly how to do it, so your operation develops and consistently applies the needed standards, habits and skills.

Eye-opening coverage of what good equipment performance is and how you intentionally achieve it

The **Foundations and Strategy for Engineering Asset Management Excellence** course helps you find how to institute the required practices and systems to achieve maximum life-cycle profits from your operating plant and equipment. You are guided you from the right concepts, to their implications and their masterful implementation.

You get a thorough coverage of the work processes and the business systems needed to coordinate and achieve maximum production plant and equipment performance. During the courses, you discover the methods that work for your business to deliver plant and equipment performance excellence. You learn how to lower production costs and get high profit margins by:

- **controlling the inherent variability in both business and operating processes to within designated limits,**
- managing risk by reducing the likelihood of adverse incidents, along with minimising their consequences,
- **preventing failure by setting and adhering to high quality standards throughout your plant and equipment lifetime, including capital equipment acquisition and installation,**
- ensuring the accuracy and precision of every human activity and intervention,
- **minimising total lifetime costs with proactive, fact-based financial modelling of operating profitability.**



The content of the courses provide you with the guidance you need in improving production plant and equipment performance. Developed from foundation elements of systems engineering, reliability engineering, maintenance management, operational management, risk management, industrial engineering and guided by sound financial management practices, the courses provide full coverage.

These could be three of the most important days for your operation's future success

Your operation needs new and better answers to its problems than are available to it today. Each course covers the key aspects that make the difference to production plant and equipment performance.

- You will understand why other business processes (projects, engineering, operations, finance, and quality) need to interact correctly with your EAM process for on-going low operating costs and high plant availability.
- **You will discover and come to know novel, innovative and often revolutionary concepts used by the top operations.**
- You learn the most modern practices and understandings available in enterprise asset management today.
- **You will see how to achieve your business plans and profits through the wise use of your engineering physical assets.**
- Most importantly, you will be able to manage your plant and equipments' life cycle from concept through to decommissioning so you and your people make the good decisions that bring business and personal success.
- **You will discover how to use the 'Asset Management Success Equation'.**
- You will learn how to design, operations, maintenance, finance and business risk management integrated?
- **You discover why PAS 55 (the first Engineering Asset Management standard) cannot solve your EAM, reliability and maintenance problems (if you aren't aware of this you will waste time and resources).**
- You will see why it is critical to your operation's success to embrace quality management if you want to get 100% right-first-time performance every time.
- **You will know why 'Plant Wellness and Equipment Health' delivers better operating performance.**

By attending the **Strategy for Industrial Asset Management Excellence Course** you can discover all the 'insider secrets' (i.e. the specific methods that really make the difference) of highly productive operating plant and how to use them to improve your business' performance.

You get the right information and methods needed to improve your business processes, and your operating and maintenance practices, so top-class performance becomes natural, normal and inevitable for you. When done well, your operation will deliver least cost production that provides it with big operating profit margins forever. **It does not matter what industrial or manufacturing business you are in.**

Foundations and Strategy for Engineering Asset Management Excellence

Welcome to Day 1 – *Important Reliability Fundamentals for Industrial Operations*

Our Process to Achieve the Goals
 Objectives for You to Achieve
 Will What You Learn Work?
 A Quick Recap of the Course
 Enterprise Asset Management in Business
Everyone has an Important Part to Play
 Lack of Asset Management Care
 Plant and Equipment Life Cycle
 When Operating Costs are Committed
 Reliability History Overview
Activity 1 - Reliability of Parts and Systems
 Equipment Reliability Curves
 Equipment Reliability Strategies
 The Reliability of Machinery
 Failure Prediction – Weibull
 Reliability Mathematics
 Measuring Reliability for Components – Weibull
 Reliability of Parts and Components
 Reliability for Systems
 Measuring the Reliability of Systems
 Modelling System Reliability
 System Reliability Block Diagram
 Maintenance is an Economic Decision
 Defect and Failure True Costs
 Costs of Multiple Defects and Failures
 Need to Capture All Incident Costs to Justify
 Removing Their Causes
Activity 2 – Defect and Failure True Costing Review
 The Degradation Cycle
 Over-stressing of Parts
 Physics of Failure
 Failure Mode Effects Analysis (FMEA) Basics
 Failure Mode Effects Analysis
 Defects and Failure >>> Process Volatility
 Controlling Process Variation
 Benefits of Failure Elimination
 Understanding and Measuring Risk
 Similarity between Safety Incidents and Equipment
 Failures
 Risk Management Process
 The Application of Risk Based Principles to
 Maintenance
 Identify Your Equipment Risks and Priority

Equipment Criticality
 Match Maintenance Strategy to Equip Criticality -
Risk Based Method
 Choice of Maintenance Type - *Simplified RCM
 Method*
 Life Cycle Risk Management Strategy - *Optimised
 Operating Profit Method*
 Equipment Criticality Matrix
 Improve Reliability by Removing Risk
 Maintenance Strategies for Risk Reduction
 Money can't buy Reliability
 The Gap is Getting Bigger – Why?
 Quotes fromSolomon Maintenance Practice
 Analyses
 Multifunction Teams Promote Better Equipment
 Performance
Activity 3 – Review RM Group, Inc Key Success
 Factors
 Measuring Equipment Performance
 Measuring KPIs and Outcomes
 Historic KPIs
 Need for Standards and Standardising

- Lubrication
- Vibration
- Shaft Alignment
- Balancing
- Component Stress and Fatigue
- Component Tolerance
- Material Selection
- Equipment Deformation Limits
- Torque and Tension

Activity 4 – Setting Reliability Standards
 Precision Maintenance of Machinery is ...

- Accurate Fits and Tolerance at Operating Temperature
- Impeccably Clean Lubricant Life-long
- Distortion-Free Equipment for its Entire Life
- Forces and Loads into Rigid Mounts and Supports
- Laser Accurate Alignment of Shafts at Operating
 Temperature
- Low Vibration with High Quality Balancing of
 Rotating Parts
- Correct Torques and Tensions in all Components
- Accuracy Controlled Procedures with 3Ts
- Correct Tools and Skills to do the Task Precisely
- Failure Cause Removal to Increase Reliability

Review of the Day – Reliability Concepts in
 Enterprise Asset Management

Welcome to Day 2 – *Understanding the Purpose of Maintenance Management*

A 'System' to Maximise Life Cycle Profit
How to Control Life Cycle Operating Cost?
Plant and Equipment Life Cycle
Plant and Equipment Life Cycle Costs
The Human Element in the Life Cycle
Calculate Failure Cost Impact
Follow the Failure Cost Surge thru the Company
Defect and Failure Total Costs go Company-wide
Calculating DAFT Costs
Design and Operating Cost Total Optimised Risk
Process Variability must be Controlled
Effect of Production Process Variability
Learn the Basics of Statistical Control - 'Six Sigma' method
Purpose of Controlling Process Variability
'Preventive' Statistical Quality Control
Activity 5 - Human Error Rates
Accuracy Controlled Enterprise (ACE) Standard Operating Procedures
Waste is Expected in This Process
Activity 6 – Develop a 3T SOP
Variability and Risk Across the Life Cycle
Effect of System Failures Across Life Cycle
Think 'Systems' Solutions
World Class Practices at Every Step
Risk Removal
World Class Practice In Every Step Requires a Quality Management System
Think 'Quality Systems' Solutions
Similarity between Safety Incidents and Equipment Failures
Safety Failures – Always more than one cause - The Titanic Disaster
What Risks Are Out There?
Risk Reduction vs Safety Management

Which Risk Reduction Methods are Best?
Achieving the Vision by Reliability Improvement
Condition Monitoring Risks
Using Condition Monitoring (CM) to Optimise Availability
Hierarchy of Performance Indicators
Benchmarking for Direction
Benchmarking for Performance
Two types of Reliability Organisation
Characteristics of top performers
Cultural Characteristics
Ernst and Young Best Practices Study
The Pacesetter's Business Model
Create an Equipment Performance Vision
Develop A Route Map to Follow
Performance Drivers
Cascading objectives that tie directly back to the overall business goals
The Essential Differences
The role of the Auditor in a top performing organisation is quite varied.
World Class Practice - Precision Maintenance
Precision Maintenance of Mechanical Equipment
Using CM to Lift Reliability
Precision Maintenance and CM used Together Effectively, Reduce Failure
Activity 7 – Case Study 1 – **PowerTrans** - Maintenance Excellence Award Winner 2004
The PowerTrans Approach
The PowerTrans Asset Management Model
Asset Operation Sets Strategy
Organisation Structure
Start with a Corporate Asset Management Policy
Cascaded Performance Measures
Review of the Day

Welcome to Day 3 – *Putting Industrial Asset Management Together in Your Company*

ASSET PERFORMANCE

- Plant Availability:
- Plant Reliability:
- Generation Plant Fuel Conversion Ratio:
- Forced Outage Factor:
- Scheduled Outage factor:
- Mean Time Between Failures:

MAINTENANCE TEAM PERFORMANCE

- Mean Time to Repair:
- Work Order Completion:
- Labour Hours Completion:

- Labour Efficiency Factor:
- Backlog Hours:
- Corrective Maintenance / Preventive Maintenance:

PERSONNEL PERFORMANCE

- Individual measures:
- Challenge Organisational Structure and Culture to Seek '*Passion and Spirit*'
- People Involvement
- Clear Accountability, Responsibility and Reward

Life Cycle Perspective

Wide Distribution of Asset and Technical Information

Asset Management in a Nutshell

Benefits of Failure Elimination

Money can't buy Reliability

Financial Benefits of a Reliability Focus

Justifying Use of Asset Management *When Loosing Market Share*

Justifying Use of Asset Management *for Increased Production (Use the 'Hidden Factory')*

Justifying Use of Asset Management *for Maximising Life Cycle Profit*

Best Life Cycle Return on Capital Assets

Activity 8 – Case Study 2 - The DuPont Chemicals Experience

Maximising Operational Efficiency

RCFA Can Be Used on Chronic and Sporadic Failures

Human Actions

The Asset Management Journey

Another View of EAM Excellence

Stepping Stones to Physical Asset Reliability

A Reliability Creation Model

Plant & Equipment Risk Analysis (use DAFT Costing)

Tools on the Journey to Reliability

Standards and Standardisation

Activity 9 – 'The Asset Management Tool Kit'

The Necessary Practices

The Necessary Financial Methods

Prototype for Proof of Worth

Activity 10 – Asset Management Strategy Requirements

Open Discussion on Asset Management and Maintenance Management Issues from Attendees

Enterprise Asset Management Course Overview

Champions Needed

Review of the Day