

How to improve production plant performance with...

Reliability Engineering for Operating Plants

How to get Sure Production Cost Reduction by Maintenance Optimisation

In this 2-day course you discover practical methods of Reliability Engineering that you can use immediately to optimise your maintenance and equipment performance and deliver more production for less cost from your operation.



The course gives you deep insight into how to boost your equipment reliability and plant availability using practical reliability engineering methods. These two days are for executives, managers, engineers, maintenance professionals and supervision who want to lift the efficiency, productivity and output of their operating assets. You learn how reliability engineering improves operating financial results and production performance with **lower maintenance costs, less downtime, reduced failures and higher throughput**.

- You will see and understand how to use the important features and methods of Reliability Engineering to make good business decisions.
 - You will know when is the right time to use reliability engineering to most beneficially help your organisation.
 - You learn how reliability engineering is used to improve production equipment performance and profits.
 - You identify where reliability engineering can deliver simple and low-cost reliability improvements to you.
- You recognise how to use reliability professionals to deliver better operating outcomes and plant availability.
 - You learn optimisation methods and tools to select the best options for least life cycle cost from your assets.
 - You get the complete perspective on how low life cycle cost plant, reliable equipment and high production plant availability is achieved.
 - You will identify ways to select the ideal maintenance strategies for the plant and equipment in your operation.

Learn a wide range of knowledge, skills and tools such as:

- Reliability Analysis including Pareto, Trend Analysis and Reporting
- Understanding Equipment Criticality for failure risk management and identifying improvement priorities
- Coordinating and Project Management of improvement opportunities
- Root Cause Failure Analysis and Problem Solving
- Maintenance Strategy development and review e.g. FMECA/RCM
- Coordination and development of Condition Monitoring
- Asset Performance Management and Analysis e.g. OEE/Uptime
- Knowledge Management, Networking and Feedback to Frontline Personnel
- Operational and Maintenance Practices and their Influence on Reliability
- Facilitating Communication and Building Effective Team Relationships

You will gain understanding of the theory and hands-on experience of basic risk and reliability analysis through workshop exercises developed from industrial applications. The exercises focus on basic reliability analysis principles, equipment criticality and failure risk identification and management. You will learn how to make the most of your existing maintenance history and outage data, how to improve future data collection and how to use the tools and methods of reliability engineering to identify improvement opportunities.

You will see MS Excel tools used to assist with reliability engineering and maintenance management problems. You see them demonstrated and get your own copies to use at work. The reliability engineering tools you take home assist you

Onsite COURSES

We go World-Wide

Reliability Engineering for
Operating Plants
2-Days

Maintenance Management
Fundamentals and Methods
1-Day

Enterprise Asset Management
Excellence
2-Day

Maintenance Planning and
Scheduling for Reliability
3-Day

Reliability with the Precision
Maintenance Advantage
1- Day

Maintenance Management
Mastery
2-Day

Contact Us at

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Lifetime Reliability Solutions

with:

- Analysis of maintenance data
- Criticality Analysis
- FMECA/RCM
- Preventive and predictive task optimisation
- Pareto analysis & bad actor management

Detailed Course Content

The course content is comprehensive, with thorough explanations. Practical exercises and group discussions included.

Reliability Improvement

- Role of Reliability Engineer
- Reliability Roles - Obtaining the Balance
- Typical Reliability Engineer Role Profile
- Journey to Maintenance Excellence
- What is a Defect?
- Defect Elimination
- Root Cause Analysis (RCA)
- Reliability Improvement
- Reliability Engineering Context
- 8 Step Reliability Improvement Process
- Project Management (Front End Loading)
- MS Excel based Project Bar Chart
- Reliability Growth Context
- Management of Change
- Collaboration is unnatural ...
- Who Should input into Reliability - Pick the Team
- People & Organisational Structures

Requirements to Master Maintenance

- Maintenance Processes
- Flixborough - UK chemical plant destroyed

Reliability Theory

- Age At Failure Patterns
- Maintenance History
- Failure Causes - Pumps
- Weibull Distribution
- Age At Failure Patterns
- Designers View of Reliability
- Wear-out Example - Tyre Wear
- Reliability in Time Domain
- Abuse
- Infant Mortality & Poor Installation
- Random Failure
- US Navy Failure Patterns from submarines
- Most Equipment Doesn't Wear-out

- People Failure
- USS Nimitz - Some keys to their success
- Likelihood of Human Error
- Education, Training & Motivation
- Plotting Unreliability
- Exponential Distribution
- Weibull Distribution
- Normal Distribution

Data Analysis

- Data Analysis Failure Distribution
- Overview - Failure
- Patch and Restore Events
- Failures and Survivors
- Compute Costs for Range of Intervals
- Minimum Cost and "Optimum" Inspection Interval
- Optimal Inspect & Monitoring
- Optimal Replacement
- Component Replacement
- Censoring
- Weibull Distribution Parameter Estimation
- Failure Pattern Assumptions
- Data Analysis Trend Plots
- Time Lines
- Trending Performance Indicators
- Trending Reliability
- Incident plus Cumulative Plot for Effective Presentation
- Exercise – Basic Failure Data Analysis Conveyor Belt Replacement
- Exercise – Pump Failure

Criticality and Risk

- Criticality/Risk Concepts
- Risk Triangle
- Numbers, Logs and Order of Magnitude
- Computing Risk/Criticality
- Events, Scenarios & Uncertainty
- The Criticality of each area of Plant is Assessed

- Basic Ranking Process
- Exercise – Overhead Crane Failure
- Risk Triangle
- Spreadsheet Criticality Facilitation Approach

FMECA-RCM

- Failure Modes
- Top-Down Block Diagram Analysis
- FMECA Implementation
- Exercise - FMECA
- Reliability Centred Maintenance (RCM) Process
- RCM - The Seven Basic Questions
- Reliability Centred Maintenance
- Reliability Centred Maintenance Implementation
- Reliability Centred Maintenance Implementation

Maintenance Strategies

- Historical Background
- Meaning of Different Failure Distributions
- Hazard-Defences Balance
- The Life of an Item
- Degradation Rate Vs Temperature
- Measure, Diagnose, Predict and Repair
- Item Life, Failure Pattern and PF Interval
- Maintenance Strategy Selection

Maintenance Optimisation

- Optimal Inspection Interval
- Review of CM Strategies
- Variable PF Interval
- Warning Time Data
- Strategy Review Steps
- Simplified Strategy Review Exercises
- Strategy Review Output