

Plant Maintenance Overview Presentation Content

One Day Seminar on Plant Maintenance Guidelines, Best Practices, Strategies

Course Content

- Plant Maintenance Overview, Best Practices and Guidelines

Introduction to Plant Maintenance Management

- Today's Best Practice Maintenance Methodology (still misses the target!)
- The 6 Purposes of Maintenance
- Plant and Equipment Life Cycle
- What Makes a Productive Equipment Life?
- The Asset Management 'Journey'
- The Lifetime Reliability 'Journey'
- Typical Maintenance Management Process
- Strategic Business Importance of Maintenance
- The Purpose of Business

Defect and True Failure Costs

- Effects of Maintenance Costs
- Impact of Defects and Failures
- Defect and Failure True (DAFT) Costs go Company-wide
- Failure Costs Surge thru the Company
- Equipment failures and stoppages totally destroy the profitability of an operation.
- Benefits of Reducing Operating Risk
- Calculate the True Downtime Costs
- Implications of DAFT Costs on Maintenance
- Acceptable Equipment Item Failure Domain
- Discovering the Hidden Factory
- How Maintenance Planning & Scheduling Help to Reduce Unit Cost of Production
- The 'Hidden Factory'
- When Operating Costs are Committed
- Maximising Life Cycle Profits

Understanding and Managing Operating Risk

- Most Business make their Machines Break
- This is a statistically stable process of breakdown creation –
- this business makes breakdowns as one of its 'products'.
- Analysing Breakdowns in a Business
- Life Cycle Risk Management Strategy
- What Risks Are Out There?
- Risk can be Measured
- Grading Risk based on Chance & Consequence
- What Risk Means
- Risk – Reduce Chance or Reduce Consequence?
- Risk Management Process
- Maintenance Arises from Operating Risk Management and Safety Strategy
- Strategic Level Maintenance Planning
- Putting Maintenance Strategy into Action
- Use Risk Based Principles in Maintenance
- Equipment Criticality
- Identify Your Equipment Risks and Priority Equipment
- Develop an Equipment Criticality Matrix
- Equipment Criticality Matches Business Resources to Business Risk
- Match Maintenance Type to Equipment Criticality *Risk Based Method*
- Choosing of Maintenance Type
- Equipment Criticality for Subassemblies
- Maintenance Task List

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Course Content continued

Design of Machines

- Understand How Machines are Designed
- The Unforgiving Nature of Machine Design
- Know the Limits of Your Parts
- Physics of Failure
- Building for the Physics of Failure
- The Degradation Cycle
- Establish Equipment Condition Monitoring

Introduction to Reliability and Reliability Engineering

- Failure Mode and Effects Analysis Definitions
- Failure Mode and Effects Analysis (FMEA)
- Failure Mode Effects Analysis
- Which parts 'age' and which suffer stress?
- Bills of Materials in Maintenance Selection
- A Basic FMEA Worksheet
- What is the Reliability of These Parts and Systems?
- Measuring the Likelihood of Failure
- Individual Parts Reliability Curves
- Reliability Properties for Systems
- Series Systems
- Reliability Properties for Series Systems
- Reliability Properties for Parallel Systems
- The Reliability of Systems of Parts and Components (i.e. a Machine)
- Equipment reliability is malleable by choice of policy and quality of practice
- Failure Prediction Mathematics – Weibull Reliability of Parts and Components
- Implications of Reliability on Maintenance
- When and How Much Maintenance?
- Variable Operating Stresses
- Equipment Reliability Strategies
- Maintenance Strategies for Risk Reduction
- Match Maintenance Strategies to Risk
- Move from Reactive to Proactive to Risk Reduction.
- Opportunity Maintenance Explained
- Maximum Allowable Downtime
- Measuring Plant & Equipment Performance
- Benefits of Failure Elimination
- Set Standards and Standardise their Use
- 6 Mechanical Equipment Care Standards to Set, Use and Keep Using

Precision Maintenance Explained

- Precision Maintenance of Machinery is ...
- Typical Standards for Precision Maintenance Program
- Set Standards for Condition and Use of Tools and Equipment
- Precision Maintenance Delivers Big Savings
- Using Precision Maintenance
- Tell-tale Bearing Failure Signs
- Creative Disassembly – Pre-shutdown of Equipment
- Creative Disassembly – At Shutdown
- Creative Disassembly – At Strip-down
- Using Condition Monitoring to Optimise Availability

A Reliability Improvement Strategy

- High Reliability is a choice
- Value of reliability on operating time

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- Value of reliability on Unit Cost of Production
- Machines are components in series
- Electric motor drive end bearing
- Series arrangements are at high risk
- Calculating series reliability
- The problems start with chance variation...
- Variation in Torque on a Bolt
- What chance variation does to Machines
- Cause and effect of our equipment failures
- Control variability to beneficial limits
- Understanding what it means to be 'in control and capable'

Control Maintenance Work Quality

- Work is a series process of tasks
- Risks to Task Reliability
- Carpenter's creed: *'measure twice, cut once'*
- The power of parallel proof-tests
- Remove the variability
- Set task standards to deliver the quality that produces the reliability you want
- Equipment reliability is malleable by choice of policy and quality of practice
- How do we apply it to our machines?
- Electric motor drive end bearing
- Control Your Processes by Converting SOPs to 3T Accuracy Controlled Procedures
- Use condition monitoring as a measure to proof test for task quality

Reliability through Plant Maintenance Best Practice

- A Roadmap for Reliability Improvement
- Getting high equipment reliability...
- Maintenance Management Best Practice – Profit-Focused, Ultra-High Reliability