Maintenance Planning and Scheduling Course Presentation

A Three-Day Course on Maintenance Planning and Scheduling Requirements

Course Content

Maintenance Planning and Scheduling Training Course Day 1 Content

Maintenance Management

- The role of Maintenance in business and its foundation basics
- Today's Best Practice Maintenance Methodology (still misses the target!)

Introduction to Maintenance

- The 6 Purposes of Maintenance
- Plant and Equipment Life Cycle
- What Makes a Productive Equipment Life?
- The Asset Management 'Journey'
- The Lifetime Reliability 'Journey'
- Basic 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
- Repeated plant and equipment failures and stoppages destroy profitability
- 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
- Analysing Breakdowns in a Business
- Life Cycle Risk Management Strategy
- What Risks Are Out There?
- Risks can be Measured
- Grading Risk based on Chance & Consequence
- What Risk Means
- Risk – Reduce Chance or Reduce Consequence?
- Risk Management Process
- The Application of Risk Based Principles to 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 *Simplified RCM Method*
- Equipment Criticality for Subassemblies
- Which parts 'age' and which suffer stress?
- Bills of Materials in Maintenance Selection
- Activity 1 – Equipment Criticality

Course Content continued

Design of Machines

- Understand How Machines are Designed
- The Unforgiving Nature of Machine Design
- Physics of Failure
- Building for the Physics of Failure
- The Degradation Cycle
- Establish Equipment Condition Monitoring
- Failure Mode and Effects Analysis Definitions
- Failure Mode and Effects Analysis (FMEA)
- Failure Mode Effects Analysis
- Activity 2 – Failure Mode and Effects Analysis (FMEA)

Introduction to Reliability and Reliability Engineering

- 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)
- 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
- 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
- Activity 3 – Setting Reliability Standards

Precision Maintenance Explained

- Precision Maintenance of Machinery is …
- 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
- Creative Disassembly – At Shutdown
- Creative Disassembly – At Strip-down
- Using Condition Monitoring to Optimise Availability
- Roadmap Maintenance Management Best Practice – Profit-Focused, Ultra-High Reliability for Reliability Improvement

Maintenance Planning and Scheduling 3 Day Course Day 2 Content

Maintenance Job Planning

- The Purpose of Planning Maintenance
- Planning is a System to Deliver Right Actions

Course Content continued

- Work Planning System
- Maintenance Planning Horizons
- Maintenance Arises from Operating Risk Management and Safety Strategy
- Strategic Level Maintenance Planning
- Putting Maintenance Strategy into Action
- Purpose and Role of Maintenance Planning and Scheduling
- Strategic Business Importance of Planning Maintenance
- Maintenance Planners covert strategy into actions that the crew uses to deliver the objective
- The Value Stream Concept
- Standardised Work
- Standardise the Work
- " …to gain greater work utilization from the rest of the maintenance mechanics."

Maintenance Planning as a Business Process

- Standardised Maintenance Work Management Process
- The Planning Workflow Process
- Planning is a Process, and needs Control
- Necessary Planning Systems
- Scoping-out a Job
- Developing a Job Plan
- Track Planning Performance & Benefits
- Activity 4 – Planning Activity with Example A
- Work Order Costing
- Plant and Equipment Information
- Planning Documents and their Control
- Job Procedures
- Equipment Records and their Control
- Job Records and their Control
- Equipment Performance Trending
- Job Performance Trending
- Job, Work and Personnel Safety
- Specify the Workmanship Standards
- What are the Contents of a Work Pack?
- Process and Equipment Data Capture for Maintenance

Setting and Meeting Work Standards

- what do you expect of this man?
- How to Stop The Mistakes People Make
- Injury Rate v. AU/OEE - Company A
- Identifying Necessary Skills to Deliver the Needed Results
- The Required Skills are Defined By:
- What a Different a Standard Makes
- Setting the Standards for a Job
- Failure Preventing Job Procedures
- In Each Work Task Provide a Target to Hit
- Provide a Tolerance Range of Performance
- Provide a Test For Proof of Accuracy
- Including 3T Failure Prevention in SOPs
- Activity 5 – Standardised Planning Process Activity using Example 'A"

Purchasing and Stores Management

- Inventory Purchasing and Management

Course Content continued

- Important Purchasing Information
- Using Parts Lists and Parts Numbers
- Stores Best Practices
- Useful Parts Control Practices
- Count the Good Storage Practices You See Here?
- Good Order Receiving Practices
- Working with and Developing Suppliers
- Equipment Refurbishment Decisions and the Cost Drivers
- Minimum Long-Run Average Cost of Production

Project Planning Methodologies to Use

- Project Management Principles and Practices
- Bar Charting Plans and Activities
- PERT Charting Plans and Activities
- Tracking Plans and Progress with Tracking Bar Chart and Critical Path
- Tracking Plans and Progress with 'S' Curve
- How Much Maintenance Planning is Enough?
- Why Planning the Work Process is Critical
- The Start of the Work Planning Process
- Organise the Resources
- Starting the Job Right On-Site
- Plan how to Collect Information from the Job
- Measure and Prove Equipment Start-up Condition is to Standards
- The End of the Work Planning Process
- Shutdowns The top performers recipe
- Shutdown and Outages Planning
- Minimise need for Shutdowns
- Have Small Shutdowns
- Effective Shutdown Execution

Maintenance Planning and Scheduling 3 Day Course Day 3 Content

- Key Issues for Planners from Day 2

Process Variation Causes Our Problems

- 'Cross-Hair Target' Game – forcing innovation
- 5 Why Method
- Defect Creation & Failure Initiation
- Common Defect Management Strategies
- Defect Elimination & Failure Prevention
- The Trouble with Accepting a Defect
- Can we get 10,000% fewer errors?
- Reliability of Series Work Process
- Carpenter's creed: *'measure twice, cut once'*
- Parallel Process Reliability
- How Much Must WE Control Chance?
- But Paralleling Test Tasks adds Cost…
- To Have Reliability Growth You Must Reduce the Chance of Failure
- Use Basic Statistical Control
- Remove the variability
- Control Charts Spot Variation After Its Happened
- Control charts give feedback
- Accuracy Controlled Enterprise (ACE) Standard Operating Procedures
- Accuracy Controlled SOPs Prevent Variation
- Standardizing Human Dependent Processes with Accuracy Controlled Procedures

Course Content continued

- Standardising Planning Procedures and Scheduling Procedures
- Activity 6 – developing ACE 3T's - Target, Tolerance limits and Test - Procedures
- Activity 7 –Planning Activity with Example B

Key Performance Indicators

- 4 Levels of Key Performance Indicators
- Measuring and Trending Processes
- Trend to Monitor KPIs
- Showing Progress
- Use Visual Management to Show Status
- Visual Management in All Occasions
- Planning and Maintenance Key Performance Indicators (KPI)
- Maintenance Performance Prediction Indicators
- DuPont KPI Expectations
- Benchmarking against the Industry Best
- Activity 8 – Setting, Measuring and Trending Performance Indicators

Work Scheduling

- Scheduling Maintenance means …
- Work Scheduling is about …
- Scheduling in a Snap Shot
- Scheduling Makes Available Time, Place and Resources to Do the Work
- To Deliver The Maintenance Strategy You Need To Schedule It In**.**
- Develop a Scheduling Process
- The Power of a Shared Vision
- The Weekly Scheduling Meeting
- The Daily Scheduling Meeting
- Purpose of the meeting is to get WO's done
- Scheduling Meeting Factors
- Team Building / Relationship / Partnership
- Setting and Increasing Work Order Priority
- What's on the Work Schedule
- Level Work to the Available Resources
- Scheduling also Means Rescheduling
- Display the Schedule and Responsibilities
- Production: Short View; Maintenance: Long View
- Make The Production Plan the Maintenance Plan
- Production Maintenance Shuts
- Production and Maintenance Monthly
- Production and Maintenance Weekly Plan
- Production and Maintenance Daily Plan
- Activity 10 – Scheduling Maintenance Work into the Production Plan
- Role of the Supervisor: Manage Manpower & Resources to Schedule
- Planner and Supervisor Communications
- Preparations before Scheduling Starts
- Preparations by the Equipment Owner Before the Job Starts
- Preparations by Maintenance before the Job Starts
- Activity 9 – Scheduling to Get the Job Done Right First Time
- Addressing On-site Issues and Changes in the Plan
- "If It's Not Written, It's Not Real"
- Work Through a 3TJob Risk Analysis
- Actions Following Job Completion
- Monitoring Job Performance and Schedule
- Backlog Management
- Planning Backlog Management
- Maintenance Planning Course Key Issues
- Activity 10 – Scheduling Maintenance into the Production Plan
- Activity 11 – Trainee Homework and Assessment