

**DAY 2 Details of [Maintenance Planning and Scheduling Training Power Point](#)
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Maintenance Planning and Scheduling 3 Day Course
Presented by Mike Sondalini

At the following meeting ...

The Purpose of Planning Maintenance

- Maximum trade 'tool time'
- Work done 'right-first-time'

Planning is a System to Deliver Right Actions

Work Planning

Maintenance Planning Horizons

Strategic Level Maintenance Planning

Putting Maintenance Strategy into Action

Purpose and Role of Maintenance Planning and Scheduling

PRIMARY PURPOSE

“The point of instituting the Planning and Scheduling process is to gain greater work utilization from the rest of the maintenance mechanics.”

Alan Warmack, Marshall Institute

Strategic Business Importance of Planning Maintenance

Maintenance Planners covert strategy into actions that the crew uses to deliver the objective

“ ...to gain greater work utilization from the rest of the maintenance mechanics.”

The Value Stream Concept

Planning Work Process

Planning is a Process, and needs Control

Remember this ...?

One fails ... all fails! One poor ... all poor!

Necessary Planning Systems

- Planning Work Process
- Work Order Costing
- Plant and Equipment Information
- Planning Documents and their Control
- Equipment Records and their Control
- Job Records and their Control
- Equipment Performance Trending
- Job Performance Trending
- Track Planning Performance & Benefits
- Job, Work and Personnel Safety

Scoping-out a Job

- Start with a written work request

- Check the details on the request are correct
- Talk to the Requester and get their version of events
- Go to the job site and view for yourself
- Scope the job as if you will be doing it
- Use a standard scope-out form that uses key words to trigger thoughts, enquiries and information needs
- Write necessary job details into the Work Order
- Set the standards and develop the Job Procedure for the work

Activity 4 – Planning Activity with Example A

Review and Discussion of Activity 4

Work Order Costing

See the Downtime Cost Spreadsheets in the Workbook for a list of over 60 costs of failure.

Plant and Equipment Information

- Assembly & Detail Drawings
- Design Duty
- Engineering Specification
- Bill of Materials
- Parts & Material Specifications
- Manufacturer Details & Contact
- Installation Manual
- Maintenance Manual
- Operating Manual

Planning Documents and their Control

Job Procedures

This is where the Maintenance Planner makes the greatest difference for their people.

Equipment Records and their Control

- Operating Set Points
- Operating Specifications
- Calibration Settings
- Modifications / Changes e.g. materials, parts
- Inspection Records
- Condition Monitoring Records (inc Operator watch keeping records)
- Past Work Orders
- Photographs
- Root Cause Failure Analysis Reports
- Safety Requirements / Hazards
- Special Access Requirements
- Special Tooling

Job Records and their Control

- Calibration Records
- Check & Inspection Sheets

- Job Feedback
 - Forms
 - As-Found, After-Adjustment Records
 - Work Order
 - Watch-keeping Reports
- Equipment Performance Trending
- ‘Bad Actors’ Monitoring
 - Mean Time Between Failure (MTBF)
 - Mean Time to Repair (MTTR)
 - Repeat Failures
 - Uptime / Downtime
 - Improvement/Change over a Time Period
- Job Performance Trending
- Jobs Complete Without Interruption
 - Work Orders Complete per Technician
 - Percentage WOs Right First Time
 - Percent ‘Tool Time’ of Work Order Time
- Track Planning Performance & Benefits
- Percent of Plan Followed During the Job
 - Work Orders With Complete Work Packs
 - Improved Equipment Reliability
 - Improved Plant Availability
 - Maintenance Backlog by Type
 - Preventive Maintenance Complete On-Time
- Job, Work and Personnel Safety
- Specifying Workmanship Standards
- Standardised Work
 - Setting the Standards for a Job
 - Identifying Necessary Skills for a Job
 - Failure Preventing Job Procedures

The session went over time ...

They meet again ...

How to Stop The Mistakes People Make
Standardize the Work

Purpose of Standardised Work is to eliminate person-to-person variability and follow ‘one best practice’ way to do each job.

Have a precise description of each work activity specifying task accuracy, cycle time, the work sequence of specific tasks, the parts on-hand and tools needed to conduct the activity expertly.

- Find the best-practice method of doing work (individual job, jobs in a team, jobs in a process)
- Have everyone doing the jobs do them in the same standard way (take the variability out of the person-to-person aspect of each job)
- Ask people to continuously improve how these jobs are done (seek higher quality and productivity)

Setting the Standards for a Job

- Use the As-Designed Standards ... then improve them
- Work to Internationally Recognised Standards
- Build Accuracy Control into SOPs
 - Set a **target** for each task
 - Specify the acceptable **tolerance**
 - Do a **test** to prove accuracy

Identifying Necessary Skills to Deliver the Needed Results

The Required Skills are Defined By:

- Necessary Perfection and Accuracy
- The Standards to be Met
- The Consequence if Things go Wrong

Failure Preventing Job Procedures

Build Accuracy Control into SOPs

Set a target for each task.

Specify the acceptable tolerance.

Do a test to prove accuracy.

Including 3T Failure Prevention in SOPs

The session finishes ...

In the morning ...

Inventory Purchasing and Management

- Important Purchasing Information
- Useful Store Control Practices
- Good Storage Practices
- Working with and Developing Suppliers
- Equipment Refurbishment Decisions and Costs

Important Purchasing Information

- Supplier/Manufacturer
- Part Number
- Part Description
- Material Specification
- Quantity

- Delivery Address
- Buyer Contact Name
- Buyer Contact Numbers
- *What else to include ?*

Useful Parts Control Practices

- Locked store
- Receipt for each issue
- Inspect physical condition of a delivery for damage
- Receipt for each delivery
- FIFO to prevent aging, degradation, contamination
- Planned stock counts that audit entire holding
- Advise Purchaser parts are in-store
- Ensure parts reliability/maintenance
- Practice 5S in the Storage of parts -

Count the Good Storage Practices You See Here?

Working with and Developing Suppliers

- Build a long-term relationship, go and visit them
- Work with preferred suppliers, (allows you to standardize)
- Use Specifications and Contracts on Suppliers
- Have a supplier assessment process to rate them, and go with the result
- Keep a record of their performance so you can focus their improvement efforts
- Alliances and consigning work in reducing costs
- An ISO9001 quality management system doesn't mean a thing if people don't live it (check how many non-conformances are received and fix each month. If not at least one per person each month then they aren't living quality)

Equipment Refurbishment Decisions and the Cost Drivers

- When to Repair or Replace?
 - Needs a Corporate Policy with 'rules' to follow
 - Typically a Net Present Value (NPV) or Equivalent Annual Cost (EAC) financial model is used
 - Include all DAFT Costs in the model for full and true impact on the business

This session finishes ...

At the next meeting ... Project Management Principles and Practices

- Identify Work Priorities
- Define a Financial Budget
- Set Project Goals and Objectives Provide Drawings, Specifications & Standards to follow

- Plan and monitor with Bar (Gantt) Charts
- Prioritize with PERT Charts (Critical Path)
- Use Preventive Action Meetings to Prepare for All Eventualities
- Sensitivity Analysis (What-if analysis?)
- Manage to Checkpoints and with Checklists
- Go see for yourself

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

Human Error Rate

Why Planning a Work Process is Critical

Remember this ...?

We have a series process.

One fails ... all fails! One poor ... all poor!

The Start of the Work Planning Process

- Site Investigation
- Failure History
- Identify the Required Documentation – dwgs, procedures, etc
- Specifying Important Information to Capture During the Job
- Develop Job Procedure with Required Outcomes & Measures
- Specifying Parts and Materials
- Specifying Subcontract Resources
- Specifying Tools and Ancillary Equipment
- Specifying Human Resources
- Developing the Job Plan and Times
- Setting Job Performance Requirements
- Specifying Job Quality Standards
- Build-in Time for Quality Work
- Costing the Job
- Job Safety

Organise the Resources

Starting the Job Right On-Site

- Completed Job Pack
- Safety considerations identified and addressed
- Safe access provided in readiness
- Parts waiting at the job
- Special equipment and tools available when needed
- Mobile equipment at the job
- Preparations Before the Job Starts
- Isolations
- Tagging

- Handover

Plan how to Collect Information from the Job

Measure and Prove Equipment

Start-up Condition is too Standards

The End of the Work Planning Process

Shutdown and Outages Planning

Use Project Management methodology to handle the scale of work, to manage the numerous jobs, to communicate with people and to monitor preparation and progress.

Today's session finishes ...

Activity 5 – Planning Activity with Example 'A'

Review and Discussion of Activity 5

End of Day 2

What's on in Day 3

- Standardised Planning Procedure

- Another Planning Activity

- Key Performance Indicators

- Scheduling Work

- A Scheduling Activity