

STEPS TO OPTIMIZE MAINTENANCE PLANNING AND SCHEDULING IN ANY ORGANIZATION

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BY RICKY SMITH, CMRP

IN PARTNERSHIP WITH:
THE MAINTENANCE COMMUNITY BY UPKEEP



OVERVIEW:

Maintenance Planning and Scheduling is critical to the success of any Maintenance Organization, and results in a significant increase in wrench-time (Hands on Tool Time). Planning and Scheduling are two distinct functions which are dependent on each other.

Wrench-time is a measure of a maintenance personnel's time used to accomplish proactive work on time, schedule, and budget.

Wrench-time does not include time obtaining parts, tools, and instructions, work associated with those tasks, traveling to or from job sites, or time spent obtaining work assignments. It is about only focused on "hands on tool" time.

MAINTENANCE PLANNING:

Maintenance Planning is a highly skilled function that requires a basic knowledge of the maintenance work processes, operations expectations, project management, computerized maintenance management system (CMMS) and related systems, as well as a practical understanding of the work to be performed. Planning is the "what's required" and the "how to" part of any maintenance job.

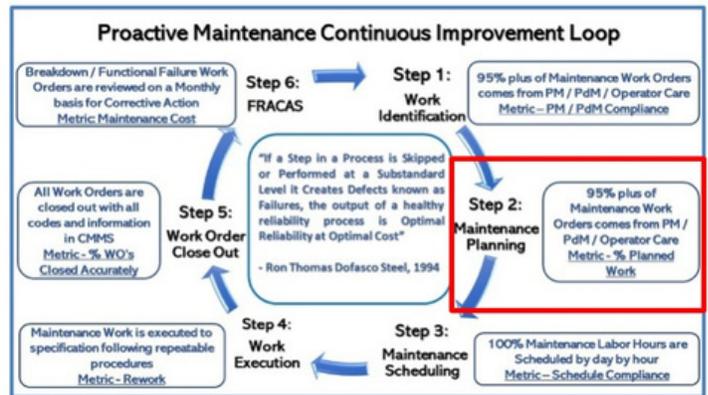
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MAINTENANCE PLANNING CONTINUED:

Planning typically includes the following:

- Parts/Materials
- Specifications
- Instructions (repeatable)
- Coordination requirements
- Estimated time
- Repeatable procedure
 - Safety/Environmental Requirements



MAINTENANCE SCHEDULING:

Maintenance Scheduling is the process by which all proactive maintenance activities are scheduled by day by hour in coordination with Production at least one week in advance.

Maintenance Scheduling requires the following:

• Maintenance Scheduling Meetings, managed by the Maintenance Planner/Scheduler.

- Production and Maintenance leadership agreement of schedule by day by hour, one week prior to scheduled work execution.

• The Maintenance Schedule is agreed upon by all parties prior to scheduling meeting.

• A Maintenance Scheduling Meeting, typically held every Thursday for 30 minutes, led by Maintenance Planner/Scheduler to ensure nothing has changed for next week's schedule.

• Personnel to attend Scheduling meeting:

• Maintenance Planner/Scheduler

• Maintenance Supervisor

• Production Supervisor / Manager

- Plant/Reliability Engineer (Optional - dependent on potential interference with next week's schedule due to contractor, project interference with schedule)

• Measurements (prefer a dashboard posted in the plant):

Breaks to the schedule by type of break, i.e. Production could not release equipment on time, No parts, Maintenance labor not available, etc.

• Schedule Compliance

• PM Compliance

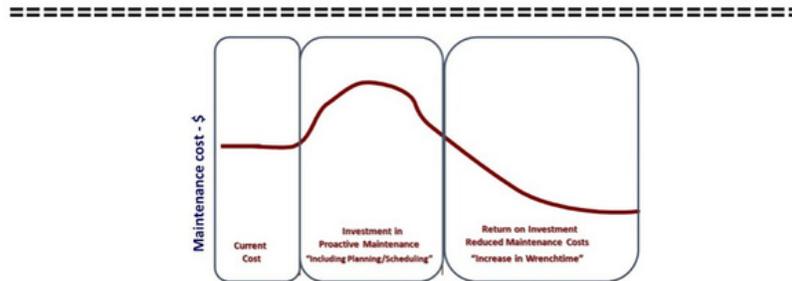
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Maintenance Planning and Scheduling Scorecard

November 2020



Planning and Scheduling is an Investment, not an Expense

PLANNING AND SCHEDULING VISION, MISSION, AND GUIDING PRINCIPLES:

- Planning and Scheduling Vision Statement: To plan and schedule maintenance work in order to optimize asset and process reliability at optimal cost.

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Doing the right work at the right time.

- Planning and Scheduling Mission Statement: Maintenance Planning and Scheduling is to enable proactive maintenance through increased "wrench-time" enabling optimal production process reliability at optimal cost.

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PLANNING AND SCHEDULING VISION, MISSION, AND GUIDING PRINCIPLES: CONTINUED:

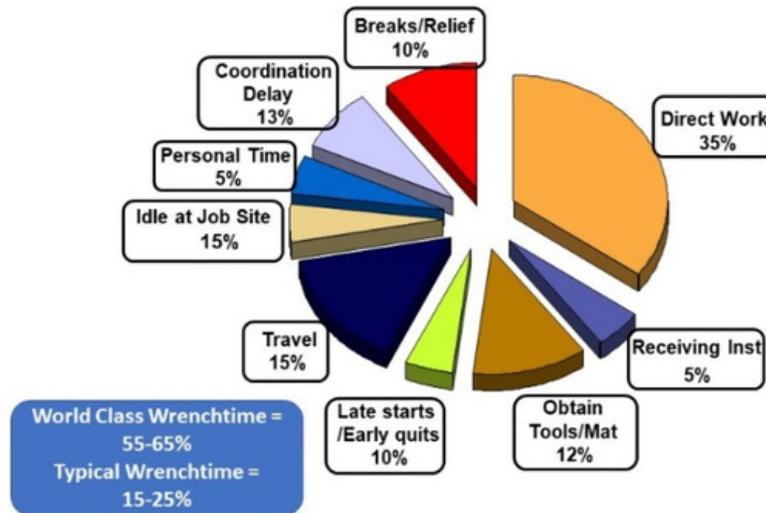
Guiding Principles:

- 1.Scheduling uses a combination of Defect Severity and Asset Criticality to determine scheduling work orders.
- 2.Maintenance Planners focus on Future Work only, today's issues are handled by Maintenance Supervisors or Lead Person
- 3.Maintenance Planners plan and schedule "Maintenance Work"
- 4.All work "Scheduled" which require parts/material are kitted in a secure area.
- 5.All Planned and Scheduled work is tracked through status codes, see "Status Codes" below:
 - a.RTS > Ready to Schedule (parts kitted and staged/secure)
 - b.AP > Awaiting Parts
 - c.AWP > Awaiting Production
- 6.All scheduled work is scheduled by day and by hour
- 7.Scheduling meetings are held on Thursday for FINAL review of the following week's maintenance schedule with Production, Maintenance, and others as required (ie Contractors, Safety)
- 8.Maintenance Planners facilitate the meeting and typically last 30 minutes.
 - a.Required attendees: Maintenance Planner, Maintenance Supervisor, Production Supervisor, Contractor (optional), Maintenance / Reliability Engineer
9. Leading and lagging KPIs are used to manage the planning, scheduling, and work execution process.

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WRENCH-TIME:



- Wrench-time is "Hands-On Tool Time"
- Wrench time is a measure of crafts personnel at work, using tools, in front of jobs.
- Wrench time does not include obtaining parts, tools or instructions, or the travel associated with those tasks.
- It does not include traveling to or from jobs.
- It does not include time spent obtaining work assignments.

STEPS TO SUCCESS IN MAINTENANCE PLANNING AND SCHEDULING:

- Step 1: Identify External Distracters
 - Poor spare parts and inventory controls
 - Conflicting ideas of what planning is
 - No planner (if you have no planner, assign your best maintenance technician to become your planner and send them to formal training. Write a Work Order scheduling the technician to this position until the company creates a new position)
 - Planners taken off job, put on tools, or involved in daily activities (chasing parts, facilitating daily work)
 - Maintenance and Production not acting as a team
 - No planning process, unclear expectations, unclear roles and responsibilities
 - Maintenance leadership not following the plan

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STEPS TO SUCCESS IN MAINTENANCE PLANNING AND SCHEDULING CONTINUED:

Emergency / Urgent Work too High

Lack of Discipline

The CULTURE

- Step 2: Education of the Team - “Coaching is not just for Planners Anymore”

Plant / Operations Leadership

Frontline Production Leadership

Maintenance and Reliability Leadership (all levels)

Planners

Maintenance Personnel

Operators

“

If you send a Maintenance Planner to training, be sure you send your best technician or maintenance supervisor as well. Change is never easy.

Tool Box Talk – Wrench Time Study
“Utilization Survey”

“Work Sampling: Why Is It Needed?”

What is Wrench Time?
Wrench Time is defined as the actual amount of time a crafts person spends doing value added work. A Wrench Time Study, or Work Sampling Study, is aimed at identifying and then allocating or mitigating the time spent on non-value added tasks.

World Class Wrench Time is 55-65%, most companies Wrench Time is between 30-50%.

“Four systems is perfectly designed to deliver precisely the results you’re getting.”
— W. Edwards Deming, PhD

Guiding Principles of Wrench Time Studies
Identify the percent of time maintenance personnel are delayed due to one of these specific reasons:

- Traveling to and from the workplace: items not in the plan
- Breakdown Planning: (emergencies or urgent work) waiting for parts, people, etc.
- Training: technical, safety, etc.
- Meetings: training, safety, etc.
- Work Execution: waiting on parts, waiting on someone, etc.
- Breaks: lunch, heat breaks, etc.
- Waiting: waiting on supervisor, another maintenance person, production, etc.
- Administrative: Union issues, personnel issues; discussion with supervisor about vacation, work orders, etc.

WARNING:
“Drive out fear, so that everyone may work effectively for the company.”
— W. Edwards Deming, PhD

We never want our employees to fear any actions we take as managers. If a wrench time study is to be conducted, it is necessary to discuss the reasons for the study and its value.

Do not follow the “just do it” approach. You want your maintenance personnel to buy in to the process.

“The only reason for conducting a Wrench Time Study is to identify the defect causing maintenance to be less efficient”

Pay Attention to This Message:
A Wrench Time Study is not about finding personnel who are inefficient, making mistakes, or performing poorly. It is about the quality of the planning process and how the organization uses the planning process.

Planning / Scheduling Impact on MTBF

How is a Work Sampling Study Conducted?
Over the years, Work Sampling Studies have taken many forms. The most infamous is the Industrial Engineer following someone around all day with a clipboard and stop watch. This technique rarely achieves accurate results.

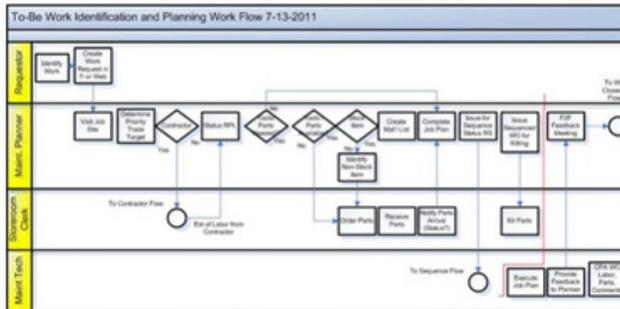
I prefer a different method. Personnel conduct the study on themselves by means of carrying around a Palm®

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STEPS TO SUCCESS IN MAINTENANCE PLANNING AND SCHEDULING CONTINUED:

- Step 3: Create Guiding Principles for Planning and Scheduling
 - The planners should focus on future work and maintain at least two weeks of work backlog that is planned, approved, and ready to schedule / execute. Planners should not chase parts for jobs in progress.
 - Supervisors and Crew Leads handle the current day's work and problems. Scheduling does not occur until parts are kitted.
 - Must maintain a stable / non-fluid Criticality Index.
- Step 4: Define the Planning and Scheduling Processes



- Step 5: Define Roles and Responsibilities

MAINTENANCE PLANNING AND SCHEDULING

Tasks Decision/Functions	Maintenance Supervisor	Maintenance Planner / Scheduler	Maintenance Manager	Production Supervisor	Tradesman	Storeroom	Operator
Work ID PM/PM/OpCare	R	I	A	A	R		R
Planning	C	R	A		C	C	
Scheduling	C	R	A	C		C	
Scheduling Meeting	I	R	A	C	I	I	
Work Execution	A		I		R		R
Work Order Close Out	A	R	I		R		R
FRACAS	A	R	R	R	R	R	R

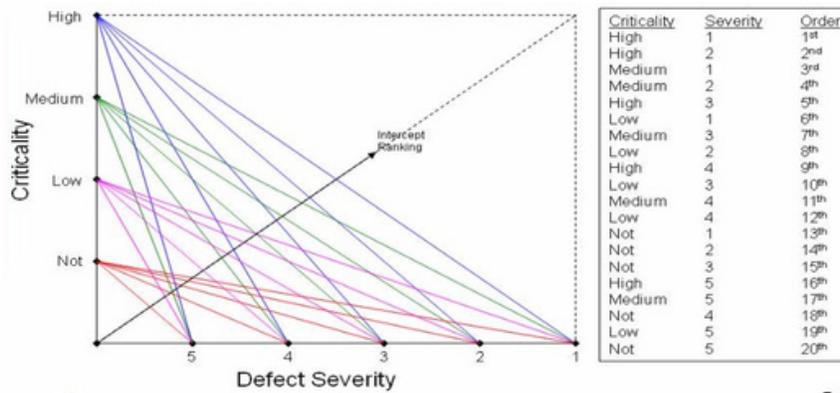
R Responsibility "the Doer"
A Accountable "the Buck stops here"
C Consulted "in the Loop"
I Informed "kept in the picture"

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STEPS TO SUCCESS IN MAINTENANCE PLANNING AND SCHEDULING CONTINUED:

- Step 6: Prioritize work to be planned based on asset criticality and defect severity



- Step 7: Develop Repeatable Procedures for all Maintenance Work in order to:
 - Ensure repeatability and reduce variation in execution
 - Capture Knowledge based on past issue/failures
 - Train New Employees with Repeatable Procedures
 - To Reduce Human Error
 - Human Error refers to something having been done that was "not intended by the actor; not desired by a set of rules or an external observer; or that led the task or system outside its acceptable limits."

Description	Probability
General rate for errors involving very high stress levels	30%
Complicated non-routine task, with stress	30%
Supervisor does not recognize the operator's error	10%
Non-routine operation, with other duties at the same time	10%
Operator fails to act correctly in the first 30 minutes of stressful emergency situations	10%
Errors in simple arithmetic with self-checking	3%
General error rate for oral communication	3%
Failure to return the manually operated test valve to the correct configuration after maintenance	1%
Operator fails to act correctly after the first few hours in a high stress scenario	1%
General error of omission	1%
General error rate for an act performed incorrectly	0.3%
Error in simple routine operation	0.1%
Selection of the wrong switch (dissimilar in shape)	0.1%
Selection of a key-operated switch rather than a non-key-operated switch (EOC)	0.01%
Human performance limit: single operator	0.01%
Human performance limit: team of operators performing a well-designed task	0.001%

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STEPS TO SUCCESS IN MAINTENANCE PLANNING AND SCHEDULING CONTINUED:

- Step 8: Create a Maintenance Planning and Scheduling Dashboard for all to see every day. People are motivated by knowing their score in any process which is critical to an organization.



- How to Create a Maintenance Planning and Scheduling Dashboard:
 - Assemble a cross functional team, Maintenance Planner, Maintenance Supervisor, Production Supervisor, Storeroom Manager
 - Determine the steps in the Maintenance Planning and Scheduling Process
 - Create a metric for each step in this process
 - Agree on the goal of each metric and how it will be measured effectively
 - Determine Roles and Responsibilities if specific metrics are meeting expectations
 - Use Root Cause Analysis (5 Whys) to identify why specific metrics are meeting expectations if this occurs

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**JOIN ME FOR A THREE-DAY WORKSHOP ON
'MAINTENANCE PLANNING AND SCHEDULING' - MORE INFO BELOW.**

Maintenance Planning and Scheduling Best Practices
May 9-11 in "Nashville, TN"

Maintenance Planning and Scheduling Best Practices
April 17-21 "Virtual"
12:00noon - 5:00pm ET

Interested? Need more information? Email me at rsmith@worldclassmaintenance.org

#1 Software for Maintenance & Reliability Teams

UpKeep is a service-first company that builds software designed to make maintenance easier for technicians and managers everywhere. Reduce downtime up to 18% by switching over to a preventative maintenance solution!

www.upkeep.com

Our Products



Mobile-first maintenance management and collaboration across all location, assets, and teams

With nearly 340 different machines in our work environment, it's an impossible task to manually assign and track PM's. **With UpKeep we can schedule regular maintenance without overlapping tasks with other critical jobs."**

★★★★★ Paul D, Health and Safety Coordinator



An end-to-end solution for remote condition-based monitoring

Connected and secure IoT sensors for real-time remote condition asset monitoring



Integrated & Centralized Data Ecosystem for World Class Asset Operations

The only purpose built Asset Data Platform. Asset Focused ELT Solution for advanced analytics and integrated, real-time asset data.

The Maintenance Community Coalition was founded on the belief that working together will benefit everyone within our community

Committed to helping each other thrive in our individual professional journeys by sharing resources and expertise, granting scholarships, hosting events, and unlocking knowledge – always at no cost.

