

The Top 10 Reasons Why Maintenance Planning is Not Effective

- # 1:** *We don't really know what good planning looks like.*
- # 2:** *Not knowing the True Wrench Time of your Maintenance Staff?*
- # 3:** *The True Definition of Maintenance Planning has never been written down and followed based on known Best Practices.*
- # 4:** *We don't understand the difference between Planning and Scheduling.*
- # 5:** *Maintenance Planners or Planner/Schedulers are not trained by a true Maintenance Planning and Scheduling Professional?*
- # 6:** *We think it is all about the Planner, & the rest of us can still be reactive.*
- # 7:** *Materials Management is operated in a highly reactive, non-focused state.*
- # 8:** *Preventive Maintenance is conducted and yet failures continue!*
- # 9:** *No focus, or little focus on Prevention or Identification of Failure Modes!*
- # 10:** *No one has the right Key Performance Indicators for Maintenance Planning!*

Ricky Smith GPAllied rsmith@gpallied.com USA

#1:

We don't really know what good planning looks like.

“you don't know, what you don't know”

See Tables 1a/1b

| Elements | LEVEL 1 NOT ENGAGED | LEVEL 2 EXPERIMENTING | LEVEL 3 ENLIGHTENED | LEVEL 4 GOOD PRACTICE | LEVEL 5 BEST PRACTICE |
|--|---|---|--|--|--|
| Planning Training | No formal training provided | Planners have attended a formal planner training course or workshop | Maintenance front line supervisors have attended formal planner training or workshop in addition to planning staff | Maintenance and operations leaders have attended formal planner training or workshop. | All individuals involved in the work management process and leadership positions have received formal group training. |
| Planner Role and Responsibility | No planner role identified | Roles and responsibilities not clearly defined. Planner is involved with daily emergency/reactive work and parts chasing. | Planners develop and assemble limited job packages. Planner responsibilities overlap heavily with maintenance supervisor | Planners focused on meeting best practice standards for Outages; day to day planning is still limited. Limited responsibility, overlap with other positions | Planners strictly focused on planning future work. Zero involvement with reactive work. Roles and responsibilities clearly defined and adhered to. |
| Standard Work Procedures | No effective work procedures or accurate time estimates developed by planner. | High level work procedures developed for large jobs and outages. Heavily dependent on OEM manuals. Standard set of expectations for job plan content not established. | Standardized format for job plans established; expectations on quality and content are subjective. No clear expectations for which jobs should have a detailed plan developed. | Formal expectations developed for job plan format and content which is generally followed. Job plans are developed for work on critical assets. Moving towards qualitative vs. subjective inspection criteria. | Level IV + Long term plan in place. All criteria are objective. Evidence of continuous improvement system in place. |
| Labor Estimation | Job plans have no estimated labor hours assigned. | Jobs are grossly overestimated (1/2 shift or full shift) and not taken seriously in scheduling process. No formal estimating techniques are used. | Job estimates are generally more accurate; basic estimating process applied. Estimates are usually accepted as being accurate but are often overridden. | Jobs are broken down into individual steps and tasks. All tasks have a time estimate; rolling up into total job estimate. Considered to be accurate and greatly impacts the building of the weekly schedule. | Level IV + Job plan include estimates for coordination and other outside resources. Estimates adjusted based on historical performance. |

Table 1a

Table 1b

| Elements | LEVEL 1 NOT ENGAGED | LEVEL 2 EXPERIMENTING | LEVEL 3 ENLIGHTENED | LEVEL 4 GOOD PRACTICE | LEVEL 5 BEST PRACTICE |
|--|--|---|---|--|--|
| Job Site Visits | Job site visits are rare/ non existent while "planning" work. | Planner visits job sites for "high profile" jobs only while planning work. | Planner visits large or complex job sites during planning only when no pre-existing job plan exists. | Planner reviews some job plans with maintenance supervisors and technicians at the job site to ensure completeness. | Job site visits and significant interaction with those that will perform the work is a standard practice. |
| Identification of Safety Requirements | No identification of Safety/Tag out/Permit requirements by the planner. | Planner includes high level references to site safety policies on work order. | Planner makes reference to generic safety procedures or requirements on the work order based on the equipment type/ environment. | Planner prepares detailed list of safety hazards and references permits required based on job task breakdown and site visit. | Level IV + methods to address these hazards are provided. Permits are pre-populated as much as possible and included in the work packet. |
| Determination of Required Materials | No predetermination of needed materials. Materials acquisition is entirely up to technicians "on the fly" while executing job. | Technicians identify their own materials and the planner places the order. List is quite often inaccurate. Job delays from missing material common. | Planners work with maintenance supervisors and technicians along with past job history to develop list. Storeroom runs during job execution still common. | BOM and job history utilized but gaps exist. Planner expends a significant amount of time researching materials. Job delays from missing materials only occasionally occurs. | Bill of materials and past job history leveraged extensively. Delays in job execution due to missing materials a very rare occurrence. |
| Materials Kitting | No kitting process in place, materials acquired "on the fly" by technicians and supervisors | Materials lay down areas exist in storeroom - informal process - much confusion and inaccuracy - does not help much | Materials kitting and staging occurs for most outage jobs and only ad hoc for weekly/daily work. Technicians drive the process. | Materials kitting and staging occurs for all outage jobs and most weekly/daily work. Storeroom personnel receive pick-lists and assemble the kits. | Kitting a standard practice with few errors. Kits are kept in a secure area, verified for accuracy against the work order and easily identified. |

#2 Not knowing the True Wrench Time of your Maintenance Staff?

“Average Wrench Time of a Reactive Organization – 10 to 30%”

“Average Wrench Time of a Proactive Organization – 55 to 70%”

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 eliminating or mitigating the time spent on non-value added tasks.

- World Class Wrench Time is 55-65%
- Most companies have a Wrench Time between 18-30%.

“Your system 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 delays 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.

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 method where personnel conduct the study

on themselves by means of an electronic data logger (PDA) on which they answer some simple questions each time it signals.

With this method, no one is following anyone around; each person logs his/her own responses when prompted.

Each day, the PDA is given to a different person who carries it around and, when the PDA signals, responds with what he/she is doing at that moment. This process minimizes the fear Dr. Deming was talking about.

What Does the Data Tell Us?

All of the efficiencies and inefficiencies that an organization exhibits are reflected in the effective wrench time of a maintenance crafts person.



Reliability Week 2013

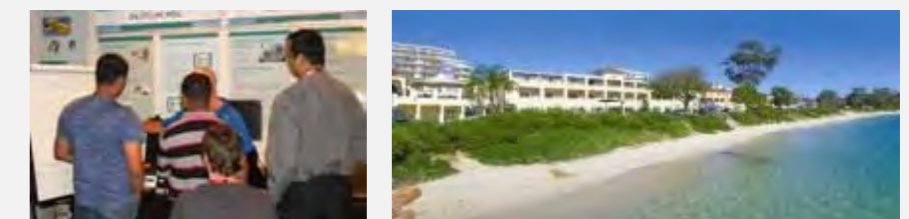
Machine Condition Monitoring Conference

19th – 21st March 2013

Shoal Bay Resort and Spa, Port Stephens, NSW

- ◆ Keynote Speaker: Ian Mackinnon – one of the world’s most enthralling reliability and CM experts
- ◆ Hands-on CM training and challenges
- ◆ Streamed program for beginner and professional alike
- ◆ Quality venue near Newcastle
- ◆ Reliability Week is run by CM professionals for CM professionals

Visit www.alstommsc.com.au for more details or contact us on training.msc@alstom.com or (03) 9237 7577



ALSTOM | MSC

When there is poor interdepartmental communication, it will be reflected in wrench time. Where the stores function is not efficiently managed, it will be reflected in wrench time. Where the planning process is insufficient, it will be reflected in wrench time.

Essentially, the purpose of a Work Sampling Study is to measure the level of effectiveness of the planning and scheduling function within an organization, although the study goes beyond the efficiency of the planners and schedulers. A Work Sampling Study measures the way the organization uses the information that comes from the planners. It measures how each of the departments within an organization works together to accomplish work. It measures the planning and scheduling function of the organization.

In other words, a Wrench Time Study is used to determine what the typical day for a maintenance crafts person looks like at a particular facility.

How Many Observations Are Required for a Statistically Valid Study?

2,000 – 3000. Sorry; if it were easy, everyone would be doing it!

Awareness of a Problem

The more an organization is aware of its problems, the easier those problems are to fix. By participating in a Work Sampling Study, and being as accurate as possible about activities during the study, system inefficiencies will be easy to identify.

Once these are identified and addressed, the daily stress that people, especially maintenance crafts people, have will be reduced.

Imagine going to a job and the parts are already kitted and waiting for you. The machine is already shut down, cleaned out, and locked out by the operator. The job plan contains all the necessary detail required for the job, and maybe even a little more... just in case you need it for reference. How much easier would life be?

This is the goal of any maintenance organization, and the Work Sampling Study is a tool that can help accomplish this goal.

Finally, motivation is high, reliability is optimized, and everyone is happy. This is a fact and has been seen many times by managers around the world.

Outcomes of the Wrench Time Study

What happens if Wrench Time is improved?

- Maintenance work is completed on time.
- Production capacity increases.
- Everyone is happier.

What could happen as a result of increased Wrench Time?

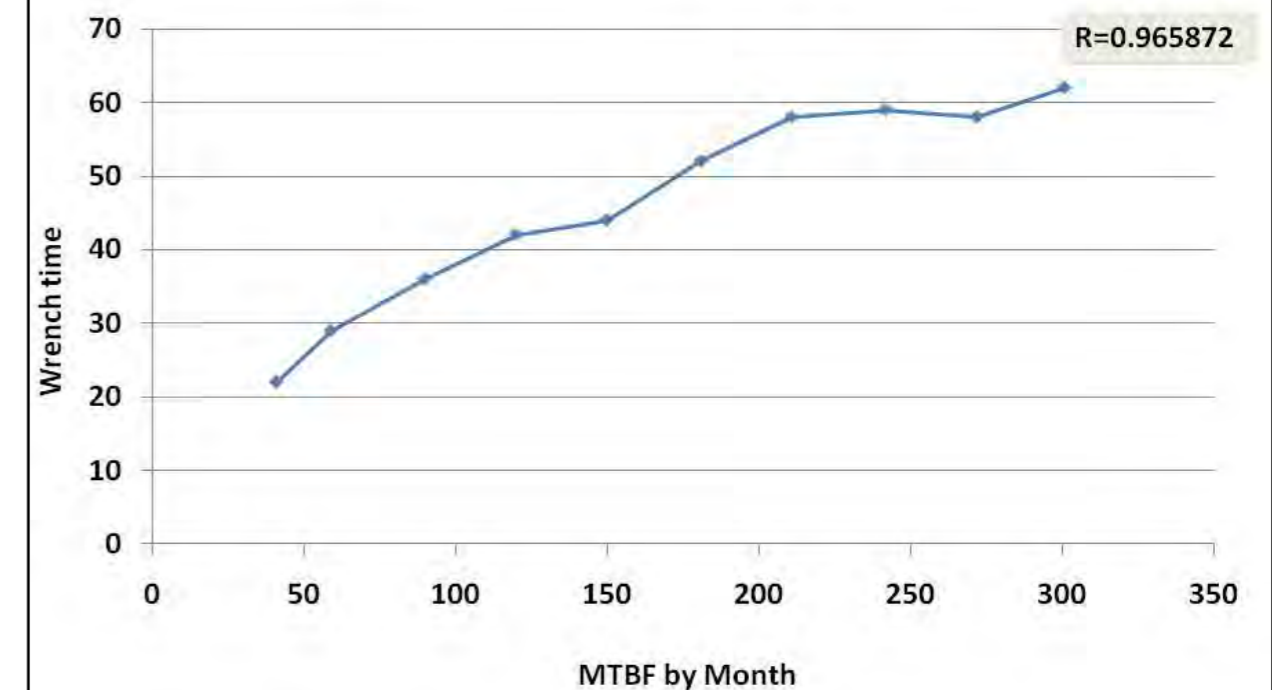
- Maintenance personnel could now be used as planners and schedulers.
- Maintenance personnel could be trained as Maintenance Engineering Technicians (they make the best problem solvers).
- Human-Induced Failures are rare.
- Production operates the equipment to specification and as such cost is reduced & capacity increases beyond expectations.
- The culture of the site is more motivated & open to change.

#3 The True Definition of Maintenance Planning has never been written down and followed based on known Best Practices.

Maintenance Planning Definition

The Identification of the parts, tools, procedures, coordination, and standards/specifications required for effective maintenance work in order to increase wrench time and asset availability and reliability.

Planning / Scheduling Impact on MTBF



#4 We don't understand the difference between Planning and Scheduling.

“Maintenance Planning”

Is the Identification of the parts, tools, procedures, coordination, and standards/specifications required for effective maintenance work in order to increase wrench time and asset availability and reliability.

“Maintenance Scheduling”

Is to ensure the right personnel are at the right place at the right time to minimize interruption to operation/production; this includes maintenance, production, engineering, safety, and contractors, etc.

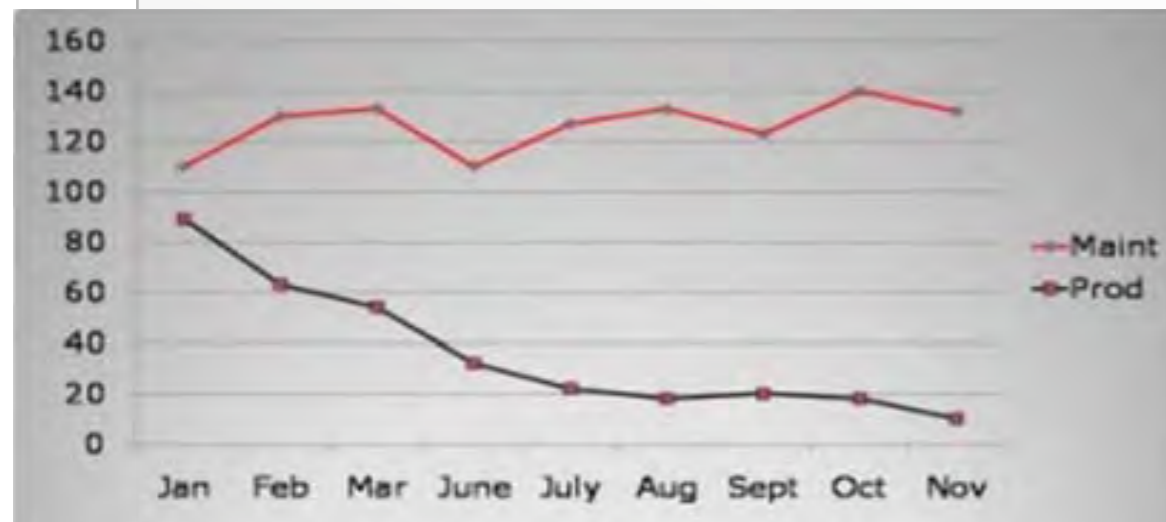
“Without a true definition of maintenance planning, you will never achieve your goal of optimal reliability at optimal cost”

#5 Maintenance Planners or Planner/Schedulers are not trained by a true Maintenance Planning and Scheduling Professional?

If companies understood the true value of a fully trained maintenance planner they would spare no expense to have them trained and coached by a true professional (check references). Think about how a trained and skilled planner benefits an organization;

- Increase wrench time (be sure the maintenance supervisor is trained as well) increases from 20% to 40%. Maintenance is now completing 100% more work and equipment failures have reduced at a rate never seen before.
- Everyone in maintenance and production must understand how maintenance planning works.
- A maintenance planner does not reactive to daily problems; this is the supervisor's function. They do not rush parts or help as a maintenance tech.

"Without a true master trainer/coach you can never achieve excellence"



Breaks In The Maintenance Schedule

#6 We think it is all about the Planner, & the rest of us can still be reactive.

- Do not blame maintenance leadership because of their reactive mind set. They were taught this way by someone else.
- How do you change this way of thinking? By visiting a company who has proactive planning in place & the results of equipment reliability proves it.

"If their thinking does not change maintenance planning will always be reactive"

#7 Materials Management is operated in a highly reactive, non-focused state.

- Materials Management will not kit parts in a kitted area or drop parts at a specific location near the work site the day or evening prior.
- Materials Management does not operate a min/max/safety stock inventory based on a criticality assessment of parts.
- Materials Management does have vendors trained to deliver the right part, at the right time, with the right quantity.
- Materials Management Scorecard is not posted for all to see;
 - % of time parts are delivered on time
 - % of time stock level of critical parts drop below safety stock
 - % of time parts are kitted and delivered for work planned by the maintenance planner (these parts must be in a secured area)
 - % of parts validated it meets what is recorded in the CMMS/EAM
 - Vendor with the highest record of parts delivered late
- Materials Management does not perform PM on highly critical stores items such as large motors, bearings, etc.

"This is not about a Department or People, it is all about a Proactive Process followed and committed to by management"

"He who lives in a glass house should not throw stones"

#8 Preventive Maintenance is conducted and yet failures continue!

What is happening is the PM program is not effective. Sure we meet PM Compliance however we do not measure the failure rate or Mean Time Between Failure or Mean Time Between Repair of the assets we PM.

An ineffective PM or PdM program takes away resources and time which could be used in a proactive state.

Below: Example of Results from an Actual PM Evaluation; ineffective PMs pulls resources needed for proactive planning into reactive Maintenance

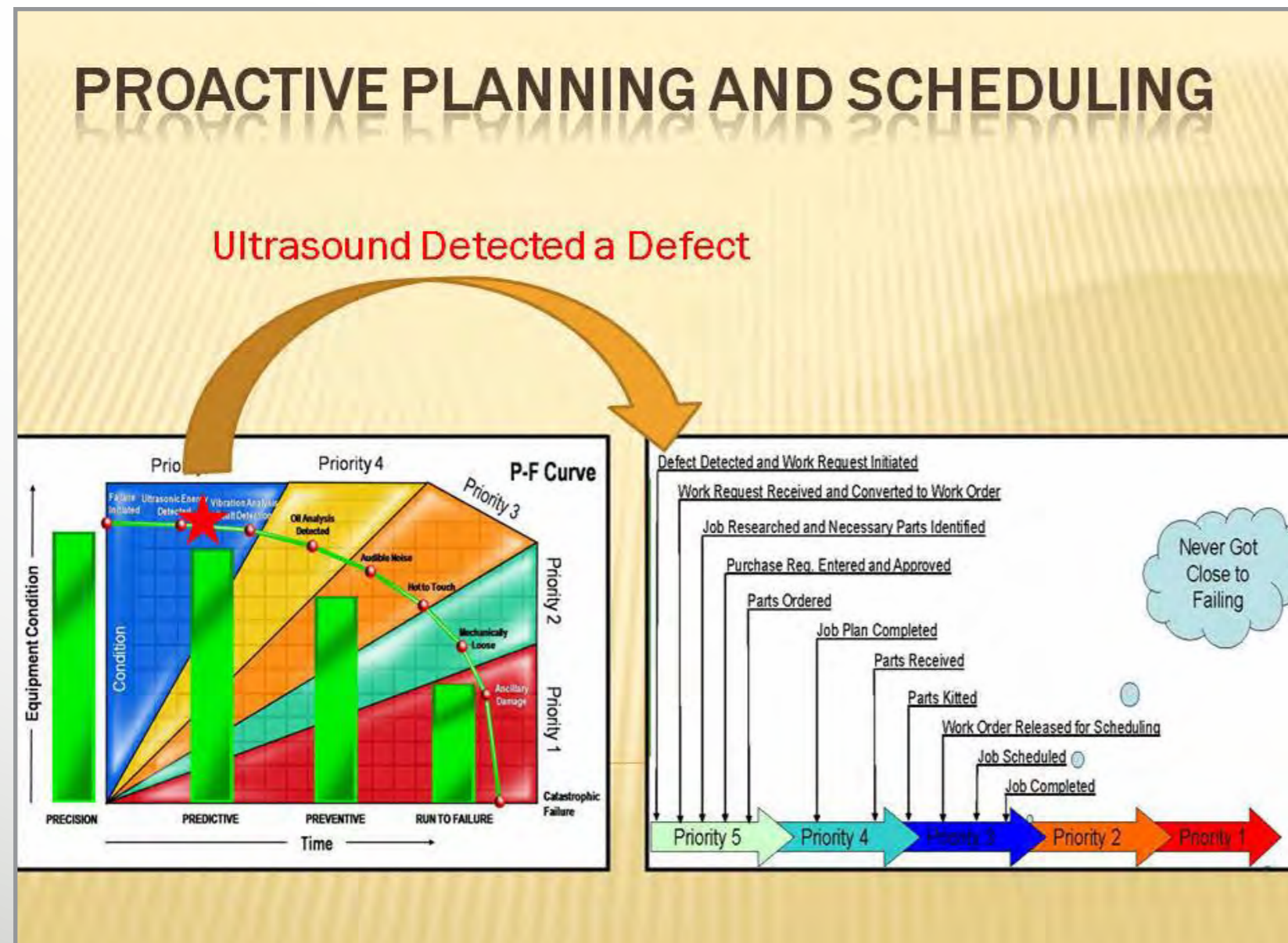
| PM Task Action Recommendation | # of Tasks | % of Tasks | Man-Hours Represented |
|-------------------------------|---------------|---------------|-----------------------|
| Non-Value Added (Delete) | 1,640 | 8.2% | 6,661 |
| Reassign to Operator Care | 1,380 | 6.9% | 5,605 |
| Reassign to Lube Route | 2,856 | 14.3% | 11,600 |
| Replace with PdM | 6,437 | 32.2% | 28,222 |
| Re-Engineer | 5,200 | 26.0% | 26,221 |
| No Modifications Required | 2,487 | 10.4% | 8,987 |
| Totals | 20,000 | 100.0% | 87,297 |

#9 No focus, or little focus on Prevention or Identification of Failure Modes!

Failure Modes Analysis is what we want to prevent or Identify early enough we so failure will not occur.

A good example of Prevention would be Conducted Known Best Lubrication Practices to Industries Standards. A good example of early Identification is the use of ultrasound to identify a defect, or abnormality, early enough we can plan the job and schedule it early enough failure does not occur. See the example below.

“Key Elements of a Proactive Maintenance Strategy”



#10 No one has the right Key Performance Indicators for Maintenance Planning!

Key performance indicators are identified to show to a planner if they are headed in the right direction or not. Knowing where you are is the first step to success. These KPIs should be posted for all to see and measured on a weekly basis and must be defined and truly measurable. It is ok to have a KPI which is not performing to expectations, what is not ok is doing nothing about it.

A few KPIs you may use are:

- % of Planned Work – The percent of all jobs which are planned. A Planned job is to have parts kitted, special tools identified, repeatable/effective procedures, coordination identified, and standards/specifications identified at the minimum
- % of Rework – The percent of planned jobs which required someone to go back to the same asset for the same reason within 90 days.
- Average Mean Time Between when Parts are ordered (by the planner not purchasing) and delivered to the Planner’s kitted area.
- % of Scheduling Meeting where all parties who are to be coordinated with join the weekly scheduling meeting by functional area.
- % of Time when a part of reserved in storeroom and released to without the planner who reserved it allowed it to be release for something other than a planned job.

Maintenance Planner Dashboard



Compliments of iDashboards.com