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Maintenance Planning Is Too Hard In My Workplace

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"Maintenance planning is too hard in my workplace." I have heard this stated hundreds of times, and in some ways I agree with it. If maintenance planning was easy, everyone would be World Class and wrench time would be above 55% in all organizations. However, less than 2% of companies can honestly say they are World Class – that's a small club, wouldn't you say?

Identify Where You Are

Let's begin with a few questions so you can measure the effectiveness of your current maintenance planning function.

1. Do you measure Mean Time Between Failures (MTBF)?
2. Do you have a maintenance planner?
3. Does your planner get involved in emergency or urgent work?
4. Does your planner have repeatable and effective work procedures for all critical or repeatable work?

   Note: Repeatable and Effective Work Procedures have, at a minimum: Step by step repeatable instructions to ensure everyone conducts Preventive, Corrective, and Lubrication maintenance following the same process and procedures; parts are kitted or staged before the job is scheduled; coordination was defined in the work package; and Specifications and Standards are defined.
5. Are the parts kitted or staged before the work can be moved to "Ready to Schedule" status?
6. Is the backlog estimated in labor hours?
7. Is the backlog broken down into categories by labor hours, "such as waiting on parts", "waiting on approval", and "Ready to Schedule"? There are other possible categories, but these examples should be enough to help you understand the concept.

   Note: 4-6 weeks calculated in labor hours is a typical backlog of a World Class Organization.
   Example: 10 maintenance technicians x 40 hours/week = 400 labor hours. This is one week of backlog.
8. Do you know the actual wrench time of your maintenance crew? If so, is it above 55%?
9. Are your emergency/urgent labor hours under 2%?

Moving Forward

How did you score on the questions above? The answers to these questions will help an organization identify the start of the path towards World Class Planning.

Why should you be motivated to move to World Class Planning:

There is no rushing around to help everyone and save the day almost every day. Wow, what a relaxing job… and it is when accomplished correctly.

The most serious issue one will face when developing a maintenance planning strategy is changing the culture of maintenance technicians, maintenance supervisors, maintenance management, production, engineering, etc. If you try to improve planning, you must address the culture first or you will never succeed. This is done through education of what true planning really is.

Let's take a look at what Albert Einstein had to say about change:

"The significant problems we face cannot be solved at the same level of thinking we were at when we created them."

The bottom line is that everyone must understand the value of maintenance planning and agree with the process. Like a wise maintenance manager at a World Class facility told me,

"this isn't about commitment, it is all about compliance."

Why Is Maintenance Planning Sometimes Not Effective?

Most people, when not motivated or not led by a true leader, begin to stray like lost sheep. Leadership is the first place to begin the education of true maintenance planning and also the rest of a proactive process. All the pieces need to fit together in order to achieve success.

Let's look at the results of proactive maintenance planning:

There are many measurements that should be taken and used to evaluate a maintenance planning strategy. If they do not synchronize with your overall maintenance process, you will not see the results you expect. Other measurements are an output of Maintenance Planning effectiveness or can cause maintenance planning to fail.

Listed below are some leading indicators for verifying maintenance planning effectiveness:

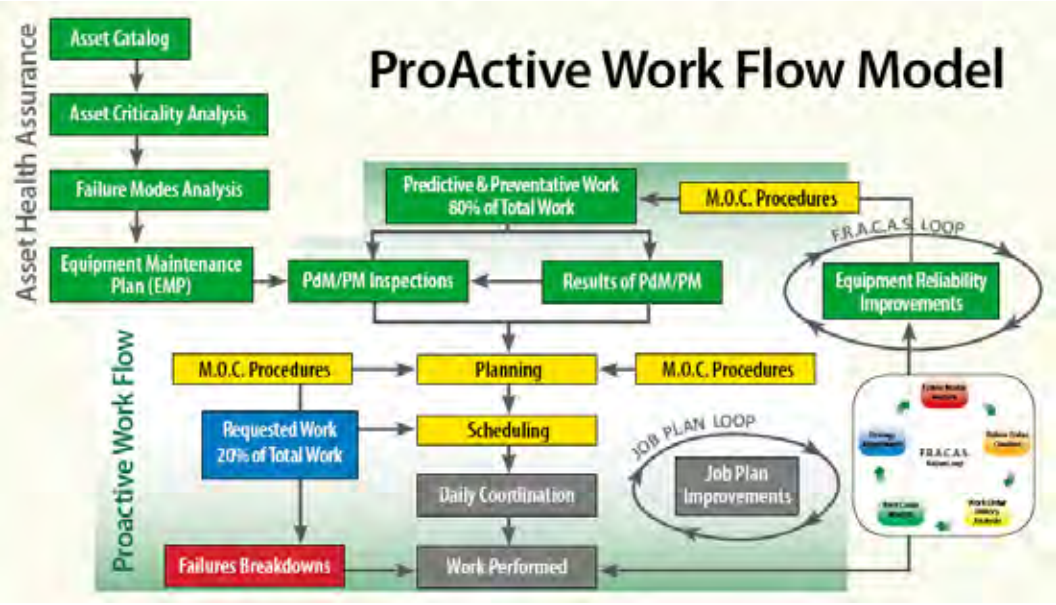
- 100% PM Compliance using the 10% Rule on critical assets
- Emergency labor hours are trending down and percent of Planned Work is trending up
- Vendor Efficiency is above 99%

  Note: Vendor Efficiency is calculated as the percent of time parts are delivered on time x the percent of time parts are ordered the same day x the percent of the time the right part and correct amount of parts are delivered.
- Stores Efficiency is above 98%
- Stores Stock Outs are less than 2%
- Most of the jobs that are planned come from Potential Failures

  Note: A Potential Failure is an identifiable physical condition that indicates a functional failure is imminent and is usually identified by a maintenance technician using Predictive or quantitative Preventive Maintenance.
- Rework is less than 2%

MTBF is one measurement of maintenance planning that should definitely be required as it is a key Lagging Indicator. I know you are thinking, "does effective planning really correlate with MTBF?"

In the graph below Check out the correlation of the data from a World Class Maintenance Organization, which demonstrates it does correlate. Optimize the maintenance process and it will change your life.



You may be asking yourself, "How did this company obtain this type of increase in MTBF in such a short period of time just by focusing on maintenance planning?"

If someone tells you maintenance planning itself makes your equipment more reliable and you believe them, then I have some property in Antarctica I would like to sell you.

Maintenance planning cannot be successful without:

- Maintenance planners focusing most of their time and effort on planning jobs for the future, or Potential Failures
- The right work being identified at the right time. Most work should come into maintenance planning from Preventive Maintenance(PM) and Condition Based Maintenance (CBM) Tasks:
  - o Execution of PM Tasks (includes lubrication) – 15% of total work
  - o Work coming from the PM inspections – 15% of total work
  - o Execution of CBM Tasks – 15%
  - o Work coming from CBM Task – 35%
- Storeroom and Purchasing adhering to specific guiding principles that were defined as a team with maintenance management and maintenance planning.
- The Maintenance Schedule adhering to the time estimates of the maintenance plan;
- The maintenance crew following the maintenance plan, which includes repeatable procedures, specifications, parts, etc.;
- Work Order Data being closed out accurately in the maintenance software so metrics and failure data can determine if you are headed in the right direction;
- Reliability Engineering focusing on the reduction of failures through analysis and making recommendations for changes in the maintenance strategy for specific equipment;
- Maintenance Supervisors handling emergency parts, etc. for emergency work;
- Leading and Lagging Indicators being posted for all to see.

The Proactive Work Flow Strategy illustration demonstrates how all areas must work in harmony or maintenance planning will not be effective.

If you want to know if your maintenance planning is effective, check out these two key points:

1. Call your maintenance planner and tell him or her that you have a breakdown and need a part. If you hear the dial tone, then you have a true proactive maintenance planner.

2. If you have Self-Induced Failures or Human-Induced Failures (which account for 70-80% of equipment failures) you surely do not have effective maintenance planning & it makes good maintenance planning impossible. You need to remove or reduce variation in your maintenance work.

75% of Failures are Human-Induced Failures

"Creates an environment that is not conducive for successful maintenance planning"

The following actions will all result in a failure caused by the lack of a procedure or personnel not following the procedure:

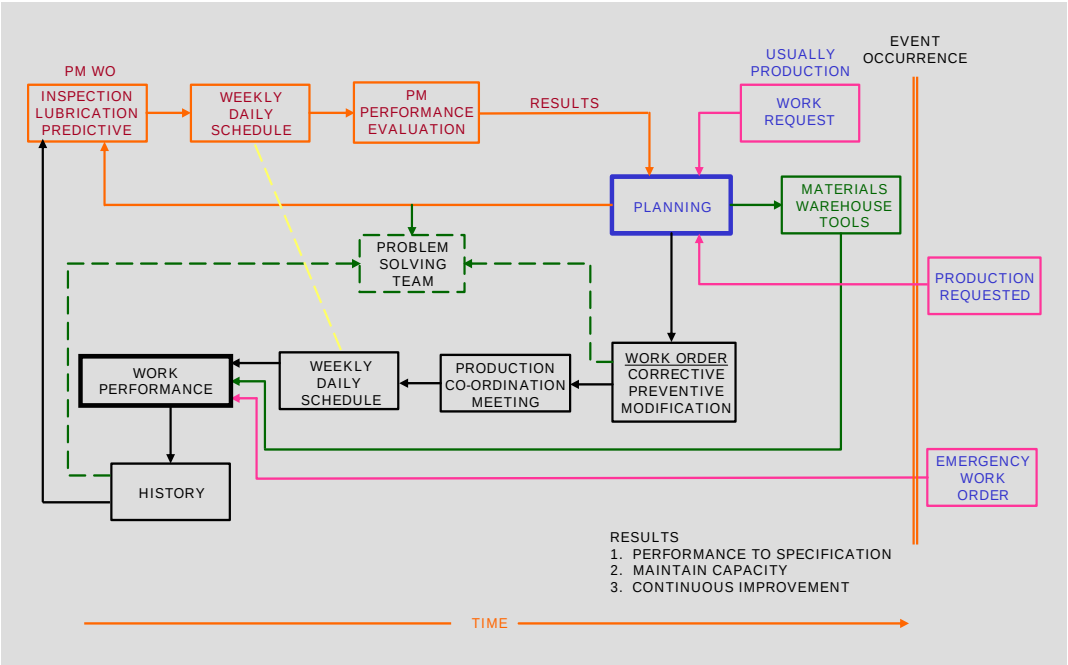
- Improperly greasing a motor
- Not using a torque wrench by mechanics and electricians
- Installing a new pump and not realigning the motor with a laser
- Not changing the Zinc Anode on a water cooled heat exchanger with copper tubes, causing pitting in tubes and water intrusion in the oil

What Is the answer?

While working for Alumax Mt Holly, or Alcoa Mt Holly as it is called today, I learned what true planning was. This site was benchmarked by hundreds of companies from around the world, and most of them came away saying, "that is nice, but we do not perform planning or scheduling like they do. We are different."

Below is the planning and scheduling process that was designed in 1980 for Alumax Mt Holly, and no, your organization is not different.

Alumax (Alcoa) Mt Holly - Proactive Workflow Model (1980)



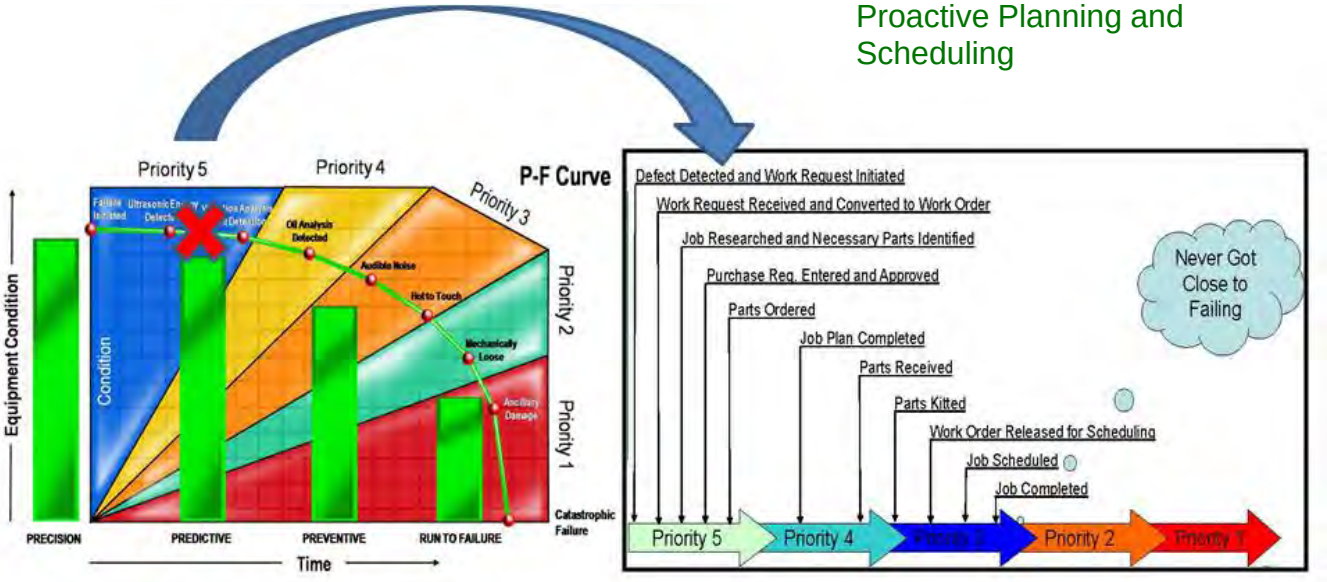
In today's world, we should be able to take maintenance planning to a new level where more of the work is identified earlier in the failure process so that maintenance planning has time to plan a job effectively.

Our focus is on the early identification of a Potential Failure or defect and not to reach the point of functional failure. Early detection of a defect is key to successful maintenance planning and scheduling.

As an example of Proactive Planning and Scheduling the diagrams below show Ultrasound identifying a problem early on the P-F Curve, which then provides plenty of time to plan the job effectively and schedule the repair or replacement with little or no interruption to operations or production.

Ultrasound Detected A Defect

Proactive Planning and Scheduling



Ricky Smith will be joining Len Bradshaw in Australia for the 2011 Maintenance Seminars:
Go to the following URL for more information: http://www.maintenancejournal.com/MaintenanceBrochure2011.pdf
Contact Ricky if you are struggling with maintenance planning: rsmith@gpallied.com

Technical Short Feature:

How Long Should A Bearing Last

The short answer: "At least as long as the desired machine life."

Design lives of bearings have always been quite conservative: the older "L10" life requirements assured that there was never a more than 10% chance of a bearing failing during it's design life - and the average bearing should last 5 times longer. Bearing life has been extended greatly over the last several decades. SKF reinvests about 2% of it's operating budget back into R&D each year to continually push the envelope of what's possible with bearing life. We still fail bearings regularly in the lab to verify that our theories match reality.

Let's get back to design life: some machines don't need so much. A table saw might see occasional use at home - an hour a week or so. That's only 100 hours a year, so even a bearing with a 1,000 hour life would satisfy a 10 year warranty. What happens when I decide to use that saw industrially, say, in a shop running 24 hours a day, seven days a week? The life requirement changes - dramatically. That same saw now needs the bearing to last 24x7x365 or almost 9,000 hours a year. For most industrial customers, you probably want that saw to last at least 5 years, meaning the design life is now 9,000 x 5 or 45,000 hours. You're going to need a larger bearing in that saw to meet the design life requirement.

Some machines have even longer life needs. A machine making newsprint paper for example, has over 400 bearings from beginning to end - and almost every one can potentially shut down production. The bearings are oversized, to give a 100,000 to 200,000 hour life with only a 10% chance of failure.

What bearing life does your machine need? Contact your local SKF Bearing Application Engineering Service - they'll be glad to help.

Content and pictures coutesy of SKF @ptitude Exchange