

WHY MAINTENANCE PLANNING & SCHEDULING MAY FAIL - PART 1

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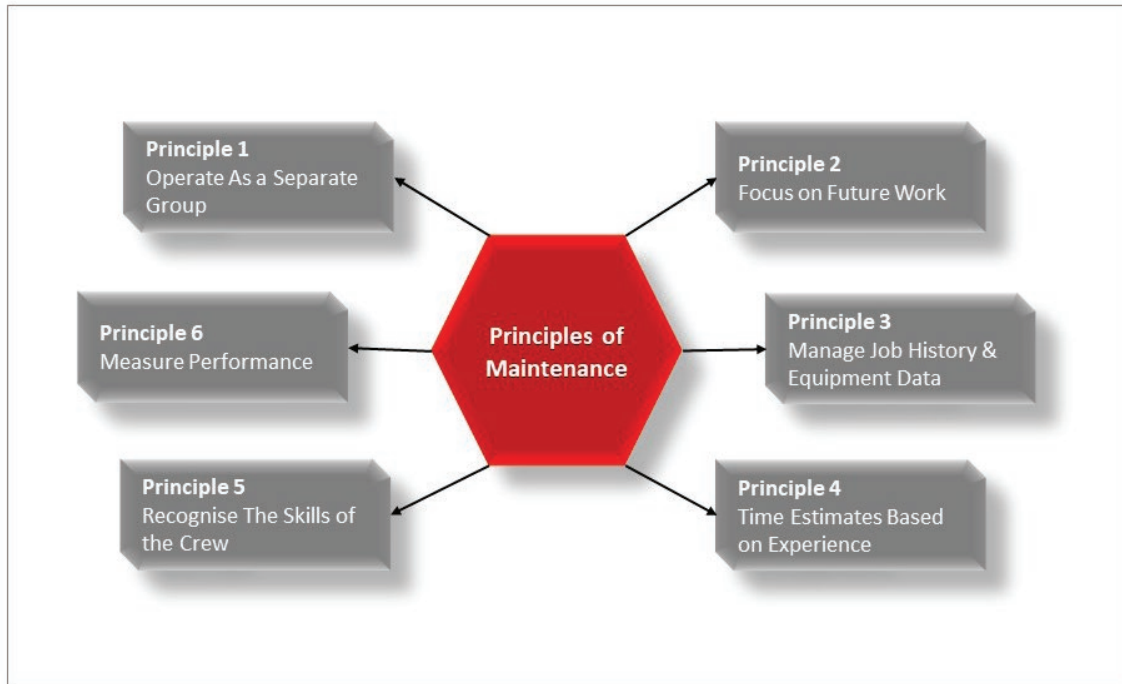
ABSTRACT

In this article we look at what causes maintenance planning and scheduling to fail to increase maintenance productivity, when at a casual glance, the framework of planning and scheduling seems to be in place in most industrial plants.

The planning function and the scheduling function each have six principles, which, when applied in their correct sequence, ensure that the maintenance planning and scheduling process will be able to deliver its main objective – to increase maintenance productivity.

Let's start with discussing the six principles of maintenance planning.





PRINCIPLE 1 – SEPARATE GROUP

The planners are organised in a separate group from the craft maintenance crews, to facilitate specialising in planning techniques as well as focusing on future work.

- Objective: protect the planners
- Reasons for planner protection: there's a difference between planner and crew functions - supervisors and craft crews focus extensively on the current day and week, whereas the planner's primary focus is on future days or weeks.
- How planners are organised: planners are not members of the craft crew for which they plan, and they should not report to the crew supervisors. They have their own supervisors, and, in most cases, they report to the same manager who holds authority over the crew supervisors.
- Reasons for separate group: planners who frequently work craft jobs devote inadequate time to planning activities.
- Causes for planners to abandon their duties for craft work: when organisations fail to align company organisation and company vision, it will result in planners made to work on craft work or stand in for the crew supervisor.
- Effects of planners being asked to assist crews: crews end up with insufficient work to execute on a planned basis merely because planners do not have time to plan much work. Planning contributes to the scheduling process; the lack of planning effort may decrease the number of work assignments to crews. Gradually the

plant returns to a situation in which crews routinely repair equipment under reactive conditions with little time remaining for preventive maintenance tasks.

PRINCIPLE 2 – FOCUS ON FUTURE WORK

The planners concentrate on future work in order to provide the maintenance department with at least one week of work backlog that is planned and ready to execute. Future work is work on which the craft crews have not yet been assigned to start.

- Objective: protect the planners from being asked to assist the craft crews with finding technical information and searching for parts during job execution.
- Causes for planners abandoning their duties: management may have started the planning department with the expectations that field technicians will never have to look for information and that planners will always plan perfect jobs from scratch. Since the planners are most knowledgeable about the plant's technical documents, and jobs in progress usually need help fast when problems arise, there's a tendency to ask for assistance from the planners.
- Effects of planners abandoning their core duties: the planner soon has no time to plan or gather job information to help future work, and eventually the plant recedes into firefighting.
- The ideal practice: before the planning department was implemented, crew supervisors knew how to obtain

parts and find file information and this practice should continue, supervisors should encourage all craft crew members to be familiar with the filing system and encourage them to give feedback to the planners. All problems arising on jobs in progress should be dealt with by the supervisors and their crews. The most important aspect is to give feedback in writing to the planners on the problems encountered and how they resolved them. The planners file that information and include it in the next job plan for that same equipment, thereby improving the quality of plans and giving the technicians a head start in avoiding previous problems.

PRINCIPLE 3 - MANAGE JOB HISTORY AND EQUIPMENT DATA

The planning department maintains a simple, secure file system based on asset identification numbers. These files can be in either manual or electronic format.

- Objective: keep files and plans at the component level, or 'mini-files'. A mini-file is a file made exclusively for an individual piece of equipment the first time it is maintained. The term mini-file helps convey the understanding that the file does not keep information for multiple pieces of equipment together.
- Causes of planners not keeping files or utilising them: management condones violation of planning principles 1 & 2 and not giving or filing feedback.
- Implementation: an intelligent numbering system of some sort is preferred, assets should be identified by numbers as opposed to their description, this clears up any confusion that might arise from different asset descriptions by different staff members.
- Filing golden rules:



- i. Do not file information that one knows will not be needed in the future
 - ii. File in 'fat files' what probably will not be needed in the future, but if needed, it must be found
 - iii. File in 'skinny files' what will be needed and used in the future
- Effects of not filing at component level: asset historical information is difficult to find when needed, meaning valuable previous feedback might not be included in the next job plan. This in turn prejudices the craft crews of improved job plans emanating from knowledge of previous problems encountered and how they were resolved.

Those who are familiar with WearCheck's web-based reporting system will see that our filing system is component based. A client might have multiple codes, depending on their operations. Calling out a certain code will give you the list of all equipment in that section. Picking out a particular plant number will reveal the different components on that equipment, opening the required component file will reveal the latest report and scrolling backwards through the reports will show you all the previous history.

In the event that a certain component is decommissioned, all its history will be archived, i.e., moved to 'fat files' and, should the equipment be recommissioned again in the future, the history will be retrieved and stored in 'skinny files' for everyday use. In just a couple of minutes all the technical information required to make technical decisions is at your disposal – thanks to the WearCheck component-level filing system.

Planning counts on the skill of technicians to include safe work practices, giving feedback for pertinent safety information to include on particular job plans. This feedback helps to institutionalise and share safety knowledge, to ensure that the company, as a whole, reflects safe work results.

PRINCIPLE 4 – TIME ESTIMATES BASED ON PLANNER EXPERTISE

Planners use their experience and skills along with file information to determine time estimates for work orders.

- Objectives: the time estimates should be a reasonable idea of what a capable technician might require to complete the proposed job without any unusual problems.
- Planner attributes: planners should possess excellent craft skills, organisational data skills and good people

communication skills. This principle recommends that management should choose from among their best craftspeople to be planners.



an ambitious target or goal. The standard set by the planner should be met, and at the same time should allow the technician to execute quality work.

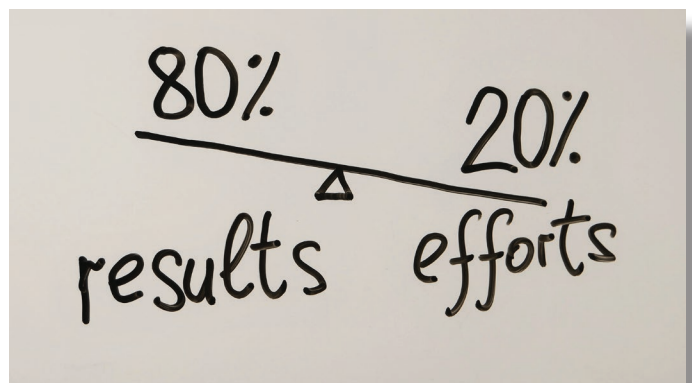
ii. The planner does not allow extra time for unexpected delays. This keeps the estimate accurate when the technician encounters no delays and provides the supervisor with a reference time for controlling the work when an unexpected delay occurs.

PRINCIPLE 5 – RECOGNISE THE SKILL OF THE TECHNICIANS

The planners count on the technicians being sufficiently skilled so that the planners can get all the work planned through putting a minimum level of detail into initial job plans.

- Management’s responsibility: this principle addresses two important issues:
 - i. Management must decide what level of skill that planning requires - the choice ranges from using a relatively lower-paid clerical skill all the way up to a higher-paid engineering skill.
 - ii. Management must decide the appropriate method of estimating job time requirements. A wide range of choices also exists for this issue.
- Ideal scenario: planners should be top-level skilled technicians so that they can best scope a job, or inspect the information in a file for its applicability to the current job being planned, for the following two reasons:
 - i. Identifying the correct job scope is of primary importance and one of the best persons to scope a job is the skilled craftsman who has successfully worked the job or similar ones many times in the past.
 - ii. When skilled craftspeople review filed information, they can deduce whether a part used on a previous job was a ‘one in a million’ type of part or if it is required on many future jobs.
- Causes of planner’s failure to plan jobs on time: the planner might be putting too much effort into time estimates. The idea of quick estimates being entirely sufficient is critical to understand, the need for an easily determined time estimate that a field technician will respect, is the fundamental reason why a planner should typically possess the skills of a top-level technician.
- Time estimations: the planner estimates how long the job should take a good technician without unanticipated delays, and this involves the following:
 - i. The planner wants to set a standard for performance through the estimate, which is not supposed to be

- Objective: the planner plans the general strategy of the work and includes a preliminary procedure if it’s not already in the file, and the craft technicians use their expertise to complete the specified work. The planner and technicians work together over repeated jobs to develop better procedures and checklists.
- Management’s decision on principle 5:
 - i. Make a choice between producing highly detailed job plans for minimally skilled crafts, or producing less detailed job plans for highly trained crafts?
 - ii. Clarify whether all the work should be planned, or are there certain jobs that would benefit from planning?
 - iii. Is strict adherence to a job plan by the technicians required?
- Reasons why planners may fail: failure to understand and implement the following:
 - i. The Pareto principle states that 20% of the effort gives 80% of the result in an area of concern. The Pareto principle therefore would suggest that planners who put 20% into every plan would be better than planners who put 80% into only a few plans.



- ii. The concept of ‘the point of diminishing returns’ means that after a certain point, further effort is not worth it. The point of diminishing returns in planning occurs when all jobs do not go through the cycle of improvement because planners get tied up on overplanning a few jobs.
- Advantages of planners who know the skill set of craft technicians:
 - i. Planners able to plan all the work means that they are not placing too much detail into individual job plans, whereas planners not able to plan all the work might mean that a problem exists in this area.
 - ii. The planner calls for a minimum craft skill on a job plan, the plan dictates the skill set necessary to accomplish the work given by the job plan.
 - iii. Having planners with experienced craft background skills, would allow them to leverage that expertise into job planning to make helpful initial job plans.



PRINCIPLE 6 – MEASURE PERFORMANCE WITH WORK SAMPLING

Measuring how much time craft technicians actually spend on the jobsite versus on other activities - such as obtaining parts/tools, travelling, waiting on permits, etc. - determines the effectiveness of the maintenance planning programme.

- Objective: the measuring of wrench time does not yield planning improvement; it only quantifies it. A properly structured planning system within a maintenance organisation yields the improvement whether it is measured or not.
- Advantages of measuring wrench time – measuring wrench time also gives an overall indication of how delays are not simply part of a technician’s job, and should be avoided.



- How wrench time is measured:
 - i. It is measured with a properly structured, statistical observation study.
 - ii. The study sets up statistical procedures to ensure proper observation techniques.
 - iii. A study conducts observations over several weeks or months to ensure a time period representative of the workforce’s normal activities.
 - iv. An observer has a list of maintenance employees at the plant each day of the study and has a methodology for selecting a sample of employees to locate each half hour or other time period.
 - v. The first moment the observer locates the employee, the observer categorises the activity as a type of work or delay.
 - vi. The observer does not merely follow the employee around to gain observations.
 - vii. The observer does not locate jobs instead of persons because some persons may not even be assigned to work.
 - viii. At the end of the study, the observer reports the proportions of observations in each category.

- How management maintains a higher degree of expertise amongst crews:
 - i. Management strives to maintain technicians’ skills with proper hiring, training, and coaching. Supervisors must shore up technicians with deficient skills rather than the planners producing extra-detailed job plans to cater for the lowest skill level of the workforce.
 - ii. Management counts on experienced supervisors to help ensure that field technicians get proper support and guidance.
 - iii. The planning system counts on the skilled technicians giving feedback on job plans so that their expertise and the planner’s expertise both contribute to adding value to future job plans.

OVERVIEW OF THE SIX PLANNING PRINCIPLES

Protect the planners from doing craft work or standing in for the supervisors

1. Planner focuses on future work
2. Planner manages job history and equipment data
3. Planners use their expertise to estimate job times
4. Recognising the skill of the technicians in making job plans protects against 'overplanning' (the 20 – 80 Pareto rule)
5. Measure performance (wrench time)

In the next article we're going to look at the six principles of scheduling in the same manner as we did with the six planning principles. We're then going to explore what the founder of Road 2 Reliability Pty Ltd, Erik Hupje, has to say when it comes to process improvements.

REFERENCES

1. *Maintenance Planning & Scheduling Handbook* – Richard Doc Palmer
2. *Road 2 Reliability Pty Ltd* – Erik Hupje

About the writer...



Raymond is the Sales Developer at WearCheck Zimbabwe, where he has worked since 2010, and prior to that he gained 18 years' experience as a maintenance artisan. Raymond's qualifications include a National Certificate in Diesel Plant Fitting, a SAIT: Lubrication engineering certificate, Road to Reliability: Maintenance Planning & Scheduling certificate and he is currently studying IPMZ: diploma in Human Resources Development. Armed with a passion for excellence and piqued by a challenge from his first ever boss, who said 'You can never fix anything if you don't understand how it works', Raymond's obsession with the finer details has stood him in good stead in the condition monitoring arena.

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