



Lean Maintenance

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Effective Maintenance Planning and Scheduling Results In Reduced Waste

Is Your Maintenance Planning and Scheduling Process Effective?

The Case For Formal Planning

Statistics support Charles Brooks Associates, Inc.'s (CBA) experience that unplanned maintenance work costs 67% more than planned work.

Also, an estimated 30% of maintenance cost is waste. Much of the waste occurs because of unplanned maintenance work. Common symptoms of unplanned work include waiting or delays due to:

1. Material or parts availability;
2. Tool or equipment unavailable;
3. Permits not ready;
4. Asset unavailable;
5. Skills not available;
6. Poor troubleshooting or problem identification.

Our experience confirms that much of the "waste" is hidden by "work arounds" and "band-aid" maintenance. It is not uncommon for technicians and engineers to tell us that the asset is back online, but repairs are still needed when the right parts are received.

The major breakdown or stoppage

is usually handled in an emergency status and all assets are committed. When this occurs, management is usually directly involved and needed repair parts are ordered and brought in at any cost. Personnel work "24/7" to get the asset back online. In most companies this is a rather rare occurrence.

The waste associated with the day-to-day repairs are not completed with the same urgency and follow through. Management is largely unaware of the frequency and causes of the "waste" associated with these activities.

Studies have been conducted to determine the major causes of waste. The key desirable activity is "direct work". Direct work is defined as "time spent working in one's craft." Examples of direct work include turning wrenches,

electricians making connections or pulling wire, pipe fitters threading pipe or attaching a fitting, or someone taking readings or acting as a fire watch during a welding operation. The results of a typical work sampling study are shown in Figure 1.

What are some of the activities that are included in these categories? They are:

1. Looking for the supervisor;
2. Waiting for instructions;
3. Looking for the work order originator;
4. Looking for parts and discovering that they are not in stock;
5. Looking for special tools;
6. Pulling off one job to start another, higher priority job;
7. Discovering that the machine is not ready.

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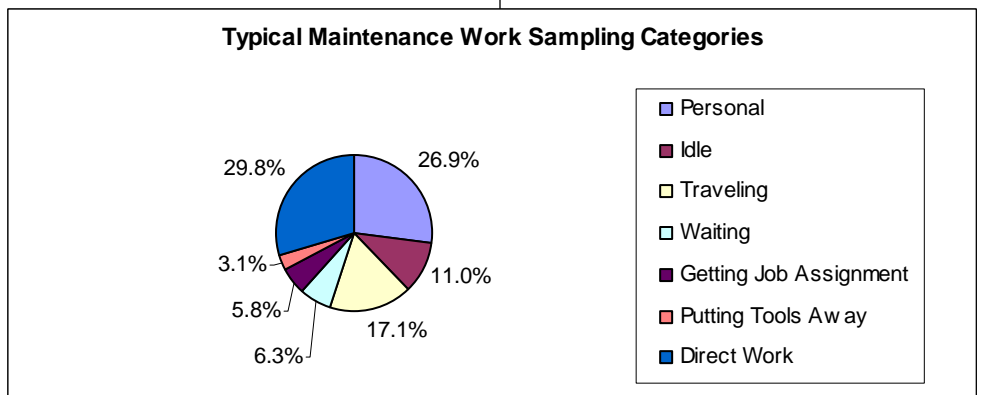


Figure 1—Typical Maintenance Work Sampling Categories

The Cost of Not Planning



- * Maintenance is typically the 2nd or 3rd largest cost element in an operation
- * An estimated 30% of the dollars spent for maintenance are wasted
- * Unplanned maintenance costs 67% more than planned maintenance

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A word of caution. There is no cookie cutter approach to maintenance work sampling. Each organization is unique enough that general categories may or may not apply to a specific situation. Wrench times of 65% have been reported by some organizations.

Wrench time will vary greatly by industry and caution is advised when making comparisons. What is clear is that there are significant opportunities to increase wrench time in most organizations.

Formal Planning

Ad-hoc planning of work takes place in organizations that do not have a formal planning function. Supervisors, Team Leaders, and Mechanics do what planning they can. The issue is that it is not a formal, completely defined process.

Planning is the process of determining the work to be performed, the resources needed, and how the work should be performed. Work planning is preparatory effort today to enable effective resource utilization during execution in the future.

Usually, formal planning takes place at least 36-48 hours before the work is performed. Most organizations use a planning worksheet that allows easy input into the CMMS system.

The attributes of planned work include:

1. Work has been captured on a work order or work request with the necessary information from the originator.
2. Work has been reviewed and determined to be necessary.
3. Work has been estimated and necessary approvals have been obtained.
4. Job has been broken down into logical steps and each step is documented.
5. If needed, hand sketches have been made to accompany job steps.
6. All materials required for the job have been identified and are/will be available.
7. All crafts, estimated time, and crew sizes have been determined.
8. All tools and equipment needed to do the job have been identified and are/will be available.
9. Any special permits have been identified.
10. Any special safety or environmental considerations have been identified.
11. Any special engineering or process modification approvals have been obtained.
12. All necessary manuals, work instructions, and drawings have been identified.

Scheduling

After the job is planned, it needs to be scheduled.

Scheduling is the process of allocating resources to specific jobs, coordinating their availability and synchronizing the various functions—all in accordance with predetermined priorities and budgets.

The attributes of scheduled work are:

1. Work priorities have been established by reviewing the backlog of planned work with customers.
2. All labor resources have been determined to be available.
3. All special tools and equipment have been determined to be available.
4. Agreement with the asset owner has been reached when work is to be done and the asset will be available.
5. All permits are filled out and approved.
6. Planner has reviewed work package with the team leader or supervisor.
7. Work order is released to the team leader or supervisor.

Work Life

In addition to better utilization of maintenance resources, planning provides the employee with:

- * Clear and direct job instructions;
- * Fewer obstacles, interruptions, and delays to work completion;
- * Increased job satisfaction.