

Planning is the Foundation of Maintenance Operations

Written by John M. Gross, P.E.
Saturday, 01 March 2003 15:15

Maintenance planning is the change that will allow you to move from firefighting to proactive planned maintenance.

By do many maintenance departments continue to fight fires—rushing from one breakdown to the next making heroic repairs? Answer: They lack planning.

Maintenance planning is the foundation upon which proactive maintenance organizations are built. Maintenance planning allows you to maximize the wrench time of maintenance technicians by having a daily plan with the right parts and tools available when needed.

How does maintenance planning allow you to make the transformation from reactive (firefighting) maintenance to proactive (planned) maintenance, if you still have the daily crises? The transformation takes place when you determine how much time you have for planned work and then start using this time to perform preventive maintenance work orders or repair/projects work orders.

This article will discuss how to start planning and how to keep it going. It will present a set of proven steps for conducting maintenance planning as well as helpful tips for successful planning.

Use work orders

First and foremost, if you do not use work orders, then start. Work orders become the communication vehicle for getting work done:

- A person writes a work order to request work.
- The maintenance planner reviews the work order and determines when/how to perform the requested work.
- Maintenance technicians receive the work order and perform the requested work.
- The planner receives the completed work order back and closes the work order.
- Finally, the requestor gets the work order back for final review.

Work orders also allow you to create a historical equipment record. This history will help later to identify trends for initiating continuous improvement projects and for calculating maintenance costs to justify new equipment purchases.

The actual work orders can take several forms: simple paper forms, multi-part carbon forms, or electronic (CMMS-based) forms. You can pick any of these options that fit your organizational culture, but start using work orders.

Set up scheduling system

Setting up a scheduling system means creating a process for deployment of maintenance

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planning. This process should include a method for receiving incoming work orders, distributing work orders to the technicians, and returning the scheduled work orders after the shift.

The process you design should allow you to move work orders through the system in a process flow. Create a basic flow that is easy to follow, but has a defined structure to prevent informal paths. Decisions that need to be addressed include how you will receive work orders, how they will get to the planner, how the planner will send work orders to the technicians, how the technicians will return the work orders to the planner, and how work orders will be closed.

If you are using a paper system to manage work orders, I suggest you use several centrally located mailboxes to receive the work orders. I also suggest you create a daily file system which becomes the vehicle for technicians to get work orders and return them at the end of the shift. With this file system, the planner puts the planned work orders in the appropriate shift folder for the day and shift; the technicians or shift supervisor then picks up the appropriate shift folder and completes the scheduled work orders. At the end of the shift, the technicians or supervisor returns the shift folder with all the work orders to the file for the planner to review.

When creating this system, consider the future opportunities to put this system in an electronic format. Eventually you may want to use electronic work orders and personal data assistants (PDAs).

Once you have the scheduling system set up, then train everyone on how to use the system. When you conduct this training, focus on what each group needs to know to use the system and not on making everyone a planner. Also, make this training visual with pictures and diagrams.

Determine how much time you have for planning

Once you have determined your planning system design, then determine how much time you actually have for planned work. Or more precisely, how much time is left over each day for planned work after considering breakdown, breaks, and lunches. When you begin building daily schedules, this quantity of time will become the amount of work you can schedule on any given day. Therefore, knowing the available time is the key to making realistic schedules and not over- or under-scheduling the technicians.

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First calculate the total available work hours. This is the total time of the technicians less the time for breaks and lunches:

Total available work hours =
(Number of technicians x number of hr/shift) – time for breaks and lunches

To calculate the time available for scheduling, next determine how much time your technicians spend on breakdowns each day. Subtract this number from the total available work hours to determine how much time you have each day for scheduling planned work:

Time available for scheduling =
Total available work hours – time for breakdowns

Plan daily by day and by shift

The final two steps in implementing maintenance planning are to make a daily plan, and to keep doing it.

To start creating a daily plan, sort existing work orders by importance. As you perform the sorting process, estimate the time and number of people required to complete the requested work and if parts must be ordered. When you have sorted all the work orders, then begin determining when the requested work can be performed.

While many people want to make this step into an extremely complicated activity, it simply involves figuring out where everything fits within the constraints of time, people, and materials. To help in this step, use decision rules (see accompanying section “[Decision Rules for Scheduling Work Orders](#)”).

As you build the daily plan, always think in terms of how many available hours exist on each shift and which work orders fit into this timeframe. Be careful to not overload the shift schedule or the technicians will treat the plan as a smorgasbord—only working on those work orders that they want to do.

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When you make the daily plan, review the work orders for clarity and direction. Make sure the work order recipient has enough information to perform the work and that you agree with the requested work. If the work order does not contain enough information or you disagree with the work request, return the work order to the requestor for clarification or changes.

Also, determine what parts are needed for the work order and have them ready for the shift that is scheduled to perform the work. If you determine that you do not have the necessary parts, then order them and schedule the work order when you receive them.

For complicated projects, consider scheduling the work order in two parts: (1) development of a plan and parts requisition, and (2) performance of the work.

This two-step process will allow you to complete more work orders while helping to develop your technicians into problem solvers.

When you have the daily plan completed, place it in the agreed location for the technicians or the shift supervisor to pick up and perform the work. At the end of the shift, they should return the plan to this location for review on the following day.

The review of the previous day's plan will be the start of the current day's plan. Work orders should be sorted by completed or not complete. Those work orders that are complete should be closed. Work orders that are not complete should be assessed for why they were not completed and dealt with accordingly.

The last step in finalizing maintenance plans is coordination. Make sure your production counterparts share your priorities and have scheduled equipment down as planned. Nothing wrecks a maintenance plan like the equipment not being available. Be advised that at first, production may be skeptical of your planning so let the results speak for themselves. As they see things getting done and uptime improving, they will begin to see the value of the plan and the importance of their cooperation.

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Keep doing it

The last step sounds the simplest, but it can be the hardest. To keep maintenance planning from crashing and burning, you need to keep doing it. If you do not manage all those little pieces of paper, then soon you have no planning. Look at planning like daily exercise—at first your muscles are stiff and sore, but as you keep it up you feel better and you begin to see results. Maintenance planning will be the same way; you start small with a few work orders that fit into the available time and as the operation improves you have more and more available time for work orders.

This incremental process is how you improve the maintenance operation and move to proactive maintenance. By using the maintenance plan, you can get PMs and project work orders completed. If you don't already have a good set of PM work order instructions, then use the maintenance plan to schedule work orders for building or improving them.

Your ultimate goal should be to reduce trouble calls to 15-20 percent of your total workload. Reaching this goal will take time and effort but it is attainable. Consider these opportunities for incorporation into your planning process:

- Schedule a weekly planning meeting with production to establish priorities and schedule downtime. This meeting must be a cooperative effort with give and take on both sides. Also, consider taking action items during the meeting to track requests and always come to this meeting prepared with your downtime requirements.
- Tie your purchase department into the work order process—see if parts can be “kitted.” When a technician gets a work order then, he is ready to perform the work instead of spending time withdrawing individual parts from stores.
- Create a metric chart to track trouble calls vs. planned work orders. If possible, track this metric by areas in your plant. Use this data for discussion in the weekly planning meeting and to identify maintenance continuous improvement opportunities.
- Consider creating a value stream map of your maintenance operation to see where you lose time and to identify waste. The future state map that you create then becomes the roadmap to proactive maintenance.

Remember, no plan is a plan for failure. To change the way your maintenance department operates, you must change how you do business. Maintenance planning is the change that will allow you to move from firefighting to proactive planned maintenance. This change takes place one step at a time, but the final results will be worth the effort. **MT**

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Decision Rules for Scheduling Work Orders

- Where do you have available hours (i.e., manpower)?
- What is the work order priority (i.e., is it routine work, a safety hazard, or an impending equipment failure)?
- When will the equipment be available?
- Which shift has the necessary skills to perform the work?
- When will all the parts be available?

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