How to...

Schedule Breakdowns Through Preventative Maintenance

Five steps to creating—and using—a simple machine maintenance program.

by Keith Hershey & Libby Maurer

The fast pace of truss and wall production causes us to always look for ways to pull extra seconds out of our assembly times. As we have written before and all know, a few seconds saved per truss can lead to substantial savings by the end of the year. But none of the extra steps you took to shave seconds off a set-up matter when you are under the gun to make a delivery, the pressure is on the line, and out of nowhere...**a machine brakes down**. Or you're on the pace to have a record week for number of pieces out the door, the crew is giving 110 percent and the press stops in the middle of the truss. We all have stories like these.

It may only take an hour to fix the machine, but you have lost 14,400 seconds of time for a crew of four assemblers. Now you may have prevented some of this loss by reassigning the crew to different stations throughout the shop, but there's no making up for the pace that was lost on the line.

So how do you prevent breakdowns from happening at inopportune times? **Schedule your breakdowns.** This may seem like a drastic step, but by implementing this, you should be able to prevent about 90 percent of those "emergency" breakdowns that completely shut down production.

How do you prevent breakdowns from happening at inopportune times? Schedule your breakdowns.

In the August 2006 issue, a **Safety Scene** article on pre-shift checklists focused on the importance of giving each machine a "once-over" prior to the start of each new shift. This concept is similar, but far more comprehensive. Used in conjunction with pre-shift checklists, a preventative maintenance program will give you a hold on your maintenance needs and will also ensure safety of your crew.

If you don't already have some sort of formal preventative maintenance program in place, your biggest challenge likely will be to get everyone on board with the idea. It's also important to note that any size truss plant will benefit from developing this system.

Step 1: Analyze Maintenance Philosophy

Traditionally, maintenance departments run themselves and require very little supervision. However, they tend to repair machines after they have broken down. Changing your maintenance philosophy from reactive to preventive is the ideal course of action. Take a moment to evaluate your maintenance department—does it fall into the "reactive" category? If so, rousing a change in how maintenance is viewed will be your first step. This could start with a simple informal conversation with your maintenance manager or a department meeting to plant the idea.

Step 2: Develop Checklist

The second step is to establish a preventative maintenance program that reports back to operations management the problems on a machine by machine basis. While it would be great to go through each and every part of every machine every week, this approach is generally not practical or necessary. Instead, make a list of five to ten key items to look at, grease, or check for adjustment on each machine. Another important function of the machine evaluation is to pinpoint areas that need immediate attention. For instance, if broken safeties or removed guards are found during an evaluation, the machine should be deemed unsuitable for operation until those items are fixed. Many major accidents in component manufacturing operations can be attributed to safeties being removed or not working properly, so this is a very important item on this checklist.

Other items on this list need to focus on parts that are likely to wear out or areas of the machine that have been problematic in the past. See the sample checklist on page 30 for some additional recommendations. This list is key to establishing a preventative maintenance program.

Step 3: Machine Evaluation

Next, you'll want to choose a day of the week to go through each machine and evaluate them based on the items on your checklist. First thing Monday morning is a natural choice for many manufacturers. For this step, it's a good idea to conduct the evaluation with the machine's chief operator because he will be the first to notice a change in the machine's performance. The main objective during your evaluation is to write down everything that you see wrong or out of place on a machine. While reviewing and reporting on the key item list, the hidden benefit is the fact that each machine will be given a little personal attention each week. This process should only take one to two hours for the whole plant (although your first few times may take a bit longer).

Having your maintenance department start off the week by reviewing, not fixing, each machine in the plant with a clipboard, pen and this checklist gives you a list with which to start scheduling. For benchmarking purposes, consider saving your weekly repair/maintenance logs. It may also help you determine when a machine needs to be replaced or overhauled.

Step 4: Review Results with Maintenance Manager

Immediately after completion, review this checklist with the head of maintenance to determine what is critical to fix and what needs to be watched. This is the point where you can schedule your down time on the machine to coincide with your production. If the maintenance department knows when they will be fixing a machine they will be able to speed the process up by having the parts on hand and their tools out and ready to go as soon as production is completed on the machine. In many cases this can save hours of downtime on the machine.

Step 5: Create the Week's Breakdown Schedule

Now that the maintenance supervisor is ready to work with the production manager to fit in all the machine breakdowns for the week. It will be critical for these two people to communicate well in order to shut down a machine at the right time and shuffle personnel. Truth is, this proactive approach to equipment maintenance is bound to make the production manager's life easier.

For example, it's Monday and from looking at my checklist, I know the breakpads on the gantry roller system have to be replaced this week. I know from experience that this will take roughly three hours. Production tells me there is a big job due out tomorrow, so Wednesday afternoon is my best bet for

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at a glance

- A few seconds saved per truss can lead to substantial savings by the end of the year.
- It may only take an hour to fix the machine, but you have lost 14,400 seconds of time for a crew of four assemblers.
- Weekly machine evaluations and scheduling breakdowns make it easy to keep track of your long-term maintenance plan and are an excellent way to keep production moving right along.

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getting at the roller. We agree that from 2 p.m. to 5 p.m., the machine will be down. Between now and then, my job is to make sure I have everything (parts, tools, etc.) here. The production supervisor will re-assign workers to other jobs in the plant so no time is lost.

If your checklist is being used properly, maintenance should be able to fit in all the breakdowns for the whole week. Now this will vary from week to week, but for the most part, you should be able to schedule inside of production that week.

Preventative maintenance is a culture very similar to a safety program. You must follow through and fix the problems that exist. If you implement this successfully, you will see a dramatic reduction of lost time breakdowns in a fairly short period of time. Also by taking care of machinery on a weekly basis, the operators will see the preventative culture and bring concerns to the maintenance department long before a break occurs.

Keep in mind that grease, tightening a chain or belt, or taking the time to clean under or around a conveyor belt when under your control and scheduled into the normal plant operations is a minor cost as compared to a breakdown when you're under the gun. Weekly machine evaluations and scheduling breakdowns make it easy to keep track of your long-term maintenance plan and are an excellent way to keep production moving right along. SBC

CHECK POINTS	REPAIRS NOT NEEDED	REPAIRS NEEDED	EST. FIX TIME	PARTS NEEDED	COMMENTS (include operators' comments)
Emergency Stop(s): Shuts down all motors when pushed.					
Emergency Stop Cable(s): Shuts down all motors when pulled.					
Emergency Stop Photo Eye(s): Shuts down all motors when blocked.					
All Machine Guarding: In place, secured and in good condition.					
All Motor Brakes: Working correctly.					
Shafts, Chains & Sprockets: No damage or unusual wear/ tear.					
Area Cleanliness: Clear of all scraps, plates, banding and other trip hazards.					
Lubrication: All appropriate parts are lubricated properly.					
Operator Controls: All lights, handheld controls and foot pedals in good condition.					
Lighting: All lights are working correctly; all light guards are in place.					

MACHINE X: MAINTENANCE CHECKLIST

Week of:

Name:

Supervisor Initials:

Machine Designation/Type:

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