Many companies are realizing that reliable production processes and equipment can be a key competitive advantage. In fact, it’s one of the few differentiators that you can leverage and sustain over time. In many industries, competitors have access to the same technology and equipment. But if you can maintain that equipment at a higher level, you can create a sustainable competitive advantage for your company. As a result, the focus of maintenance is shifting from fixing breakdowns to maximizing overall equipment effectiveness (OEE).

Reliability-focused maintenance practices such as Total Productive Maintenance (TPM) have taken their place alongside 5S and Standard Work concepts as a cornerstone of world-class manufacturing programs. Just as 5S is used to stabilize the work environment, and Standard Work is used to stabilize work practices and procedures, TPM is used to stabilize equipment performance and reliability.

Manufacturers are now saving millions by using predictive analytics and maintenance techniques to anticipate problems before they occur.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Predictive Maintenance</th>
<th>Traditional Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in maintenance costs</td>
<td>25-30%</td>
<td>70-75%</td>
</tr>
<tr>
<td>Elimination of breakdowns</td>
<td>35-45%</td>
<td>20-25%</td>
</tr>
<tr>
<td>Reduction in downtime</td>
<td>10 times</td>
<td></td>
</tr>
</tbody>
</table>
Visual Systems Improve Maintenance

While visual devices are widely used in 5S, Standard Work, Quick Changeover, Kanban and other lean techniques, you should also consider them as an important component of your proactive maintenance strategy.

Incorporating visual devices into your reliability program can provide many benefits:

- Simplified training
- Improved quality, fewer errors and defects
- Ability for virtually anyone to detect abnormalities at a glance
- Faster troubleshooting and repairs
- Fewer unplanned maintenance, repair and operation (MRO) purchases
- Reduced inventory
- Improved safety and employee morale
Simplify Preventive Maintenance

A good starting point is to use signs and labels to identify preventive maintenance (PM) points and to provide basic cleaning, inspection and lubrication instructions.

Using visual devices to identify PM points and provide detailed instructions is especially important if your company has implemented an autonomous maintenance program. When responsibilities for routine care and inspection are transferred to equipment operators instead of trained maintenance professionals, it becomes critical to clearly define their tasks and checkpoints.

For example, improper lubrication – too little or too much – is a major cause of equipment failure. A simple lube label as shown below can save your company significant costs in motor repair and replacement. In addition, color-coded markings can be applied to zerk fittings and grease guns to guard against using the wrong type of lubrication.

Oil level indicators can also be applied to sight tubes to simplify oil management. The use of green and red striped labels placed behind the sight tube lets the operator easily detect when oil levels are too high or too low.
Optimize Predictive Maintenance

Even when maintenance personnel retain control of these activities (rather than equipment operators), the growing number of new and relatively inexperienced technicians in the workforce is increasing the risk of errors and omissions.

As baby boomers retire – about 78 million in the next 10 to 15 years – the coming shortage of skilled workers will significantly affect industry. One large, well-known manufacturer recently forecasted that by 2014, approximately 70 percent of its maintenance staff will have less than five years of relevant job experience.

In addition, maintenance workers must learn how to use a growing number of sophisticated predictive maintenance technologies such as vibration analysis, ultrasound and thermal imaging. When performing predictive maintenance, it’s critical to take measurements at the same exact place each time. To ensure that the location for readings remains consistent – regardless of who conducts the inspection – you can apply predictive maintenance targets such as the one shown here.

When implementing predictive maintenance programs, reliability technicians often use inspection routes to streamline the process and maximize efficiency. One drawback to this approach, however, is that the technician may not be familiar with each and every piece of equipment, and the proper readouts may vary across different machines.
Visual controls like the gauge label below help to alleviate this obstacle by making it clear to anyone at a glance whether the temperature or pressure is within the normal operating range. In fact, these visuals make it so easy to detect abnormalities, that anyone walking by becomes a potential inspector, facilitating early detection of potential problems.

These visuals not only make it easy to detect when chain tension is too loose, but they also advise when to replace the chain. When tension slackens, links from the chain should be removed, and the adjustment block can be shifted to restore proper tension with the shorter chain. Once a specified number of links have been removed, the edge of the block extends outside of the green area, clearly indicating that the chain should be replaced.

**Speed Troubleshooting and Repair**

Visuals can also speed troubleshooting and repairs. Including “to” and “from” information on equipment ID labels makes it easier to trace lines in electrical systems and pipe networks. As a result, you can perform repairs faster and reduce the risk of errors and potential injury.
Maintenance stores are perhaps the biggest contributor to maintenance inefficiencies, and your storeroom may offer plenty of opportunities for improvement through visual management. You can make repairs even more efficient by ensuring that the proper replacement part and its storage location are clearly identified, ideally by putting the information right at the point of need as shown.

To reduce search time, and ultimately reduce downtime, clearly label shelves and bins in stock rooms and tool cribs. Where possible, use graphics and/or photos on your labels for faster recognition and to avoid pulling the wrong part.

To enhance safety and reduce hazards, many companies are posting graphical lockout procedures, including instructive photos, right on or at their equipment. Posting hazard warnings and safe work instructions right at the point of need is the most effective way to reduce accidents and injuries at your plant, and is as important (if not more so) than classroom or computer-based safety training.
Promote Error-Free Setup

When restoring equipment to operation, how can you ensure efficient and error-free setup? Visuals such as the operator control panel labels and alignment aids shown below help to simplify machine settings and positioning.

In addition, labeling the rotational direction on gears and shafts can help you avoid costly setup errors that can damage or destroy motors and drive systems.

Your Lean Resource

Check out Brady’s Lean Visual Blog to stay up-to-date on the latest Lean news. It is loaded with tips, examples and resources you can use in your facility.

Subscribe today at www.bradyid.com/lean-visual-blog

Sources:
http://www.epa.gov/lean/environment/methods/lives.htm
http://www.bls.gov/iif/
http://www.reliableplant.com/Tags/lean%20manufacturing
http://www.industryforum.co.uk/practical-solutions/tpm/early-management/
http://www.oee.com/oee-six-big-losses.html
Ready to Get Started?

After identifying the key areas that can be improved by using visuals, it is time to find the right labels and signs to get the job done.

Brady offers many pre-printed visuals to help you identify and communicate safety issues and standard operating procedures. Additionally, customization is always an option for applications that require specific messaging and this option usually doesn’t cost more than the pre-printed counterparts.

Brady also provides on-site printing solutions as a cost effective alternative for overhauling facility visuals and predictive maintenance software, like LINK360™ software, to help manage maintenance tasks for all your facilities right in one place.

To learn more about preventive maintenance and other lean initiatives visit Brady’s Visual Workplace website at: www.BradyID.com/visualworkplace