

Preventive Maintenance

How to stop firefighting and start boosting productivity.

IrvHoy

In the highly competitive business of PCB manufacturing, the fabricator must maintain an edge to keep up with the competition and stay profitable. One strategy to help maintain profitability is to keep manufacturing equipment running at peak productivity, at the lowest possible operating cost. This is where a preventive or planned maintenance program becomes important.

Why Preventive Maintenance?

A program of preventive maintenance that has been properly designed and executed can reduce costly unscheduled down time and extend the production equipment's operating life. In the past, many manufacturers simply ran equipment until it failed. This seemed to work fine when the equipment was new, but as it aged, the frequency of breakdowns increased, and the severity of these problems intensified. Failures would occur in the middle of critical production runs, for example, which affected delivery schedules. When breakdowns became too frequent and repairs too costly, new equipment was purchased and the cycle was started anew. In today's economic climate, with its high capital equipment costs

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and low profit margins on panels, this approach doesn't make sense.

Extending equipment life and maintaining peak levels of performance delays capital outlays for new equipment purchases and reduces operating expenses, thereby improving the bottom line.

Preventive Maintenance Defined

Simply defined, a preventive maintenance program comprises scheduling of routine service and repair work when the equipment will be shut down, instead of allowing the equipment to dictate the timing through breakdowns. This approach also has a significant effect on machine productivity, because all manufacturing equipment is, at certain times, not in use. If this down time can be used to

repair or replace parts that are near failure, then the probability of failure during the production cycle can be greatly reduced. Equipment operation time can be better scheduled to meet the needs of production, resulting in higher overall productivity.

Implementing the Program

There are two basic methods a manager can use to implement such a preventive maintenance program. The first method makes use of resources that are available within the company, while the other depends on outside sources.

The First Step

The initial step in building a program, regardless of the overall approach, is the planned scheduling of equipment down time. A maintenance manager can work with the production manager to select the most opportune times to take each piece of equipment out of service, thereby minimizing the detrimental effects on production flow. Then inspection, servicing, and parts replacements-type maintenance activities can be planned to correspond with these shutdown periods.

to provide input on legislation that affects the PWB industry.

PC FAB: We've heard lots of dissatisfaction from the industry lately over the pricing structure of the U.S. PWB market. Is this a problem that can be addressed (at least in part) by the IPC? If so, how?

SARMANIAN: I think the IPC can help alleviate this problem by examining board production costs worldwide and assisting its members in globally benchmarking their operations with those of other fabricators. In fact, plans are already under way to do another benchmarking exercise, this time in cooperation with the Printed Circuit Interconnection Federation (PCIF) in the U.K. We hope to include Asian producers as well. With this information, we'll have a better understanding of what changes are needed to reduce costs and improve productivity. This must coincide with management's philosophy of improving quality to reach new levels unattainable in the past. If this goal is achieved, we can address the difference in worldwide pricing through productivity increases and technological enhancements.

We must also do a better job of educating our customers and selling value. Boards aren't commodity items (though many customers treat them as such), but custom-manufactured products, integral to the functioning of almost all electronic products. PWBs are taken for granted, and we need to work together to change that.

PC FAB: What's the most important measure U.S. fabricators can take to increase their competitiveness?

SARMANIAN: In recent years, we've seen many companies leave the industry, an inevitable result of overcapacity in the global PWB market. But during that time, U.S. board fabricators, like the members

In-house Resources

When using in-house personnel for the second step, the staff must be properly trained in maintenance procedures for each type of equipment. Performance of improper maintenance techniques can be just as bad as performing no maintenance at all. Properly trained personnel will be able to detect and correct problems before they turn into unwanted down time, and be able to shorten the duration of down time when a breakdown does occur. Most equipment manufacturers offer various levels of training to help their customers maintain optimum operation of their equipment.

outside Resources

The second approach is to use outside sources for all equipment maintenance, including maintenance that is routine. A recent survey of manufacturers' showed that compan-

ies using equipment manufacturers' service representatives to perform regular maintenance on their equipment enjoy greater overall up time and productivity. Many equipment manufacturers now offer this type of service to their customers. Manufacturers' service representatives are typically well-trained in maintenance of their equipment, and can be an asset in keeping equipment in top form. Various types of maintenance contracts are available to suit the needs of individual manufacturers, offering a resource to the maintenance manager that merits greater evaluation.

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References

¹ *CircuiTree*, Equipment Maintenance Survey, 1991.

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SARMANIAN: One key is determining what the IPC can do to meet the rapid changes in the global electronics industry. Cost, quality, and technological issues must be addressed. We must also eliminate duplication of industry standards that add unnecessary requirements and make the manufacturers' and assemblers' job more difficult.

In 1994-1995, I expect to lead a strategic planning effort to review where we are, and to redefine where we should be in the next few years. At the association's long-range planning meeting in 1991, we identified changes that needed to be made. The Board of Directors and the IPC staff worked to implement them. With the rapid change in this industry in the last several years, we need to take another look. The process of continuous improvement applies to our industry's trade association and to each of our companies. FAB