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Tuesday, 01 December 1998 11:22

Maintenance through the past several decades was a relatively monolithic central function. It was usually staffed for peak activities, and often had excess capacity waiting for a breakdown to occur. With the advent of international competition in the 1980s, many maintenance staffs were cut dramatically, and over several layoffs became smaller than half their original size. These cuts were often made strictly according to either financial rules (nonunion companies laid off the most senior, expensive workers) or seniority rules (union shops left seniority in place). In neither case were skills and experience the major consideration.

Simultaneous with reducing costs, companies were forced to increase quality, productivity, and safety. These efforts focused on the manufacturing unit, looking to reduce variation in product, reduce production bottlenecks, and assure safe work practices. Quality theory told us to define who our customers are and get close to them. Most plants defined operations as the maintenance customer, and in increasing accountability for operating unit managers, gave them more control of the resources.

The initial result was a surge in machine operability as operations managers directed resources toward chronic equipment problems. The craftsmen dedicated to the units felt needed and like they were making a more direct contribution than before as part of a pool. They learned their unit's equipment intimately, and became more proficient and committed to unit performance.
What could possibly be wrong with that scenario?

Emerging concerns and limitations

In speaking with maintenance and operating leaders in dozens of plants this past year, we have heard a number of repeated concerns:

- There is no consistency to how units are performing maintenance.
- In most cases the dedicated crews are working on schedule breakers because of the ease of deploying them. If there is a plantwide priority system, it has no application to these crews. Rather, work is done to the same urgency as the production schedule.
- Planners dedicated to units do very little routine planning. Instead they are expediters or on-call supervisors, and when they do plan, it is for outages.
- Maintenance craft skills are deteriorating. No one in the organization is assuring the continuing development of craft skills.
- The computerized maintenance management system's data quality is highly compromised. Some units may use the CMMS, and others don't.
- The remaining central force feels alienated from the unit-based maintenance crew.

- The reliability engineering team (usually those who perform the predictive maintenance function) are frustrated that their success is limited to those units whose managers understand their value.
- Important measures of planned maintenance, such as percent planned work, schedule conformance, and percent preventive/predictive work, are declining or very stubborn at improving. Operating units have no standard definitions of these measures, and may or may not even measure and record them.

The first question to ask is, “So what?” If the production schedule is being met, is there any cause for concern?

There is, of course, in any industry where cost is a concern. How do you stay ahead of your competition in most businesses? You produce to a quality standard for less than everyone else. No one we’ve spoken with considers current practices to be efficient, even if they are seen as effective.

Is there a better way?

There are three possible options: (1) require operating unit managers to be better managers of the maintenance function and process; (2) recentralize maintenance; or (3) develop an organization that optimizes efficiency and effectiveness.

We can rule out Option 1. Operating unit managers seldom have strong maintenance backgrounds, and would be required to make balanced decisions.

That is possible, but unlikely. Option 2 would bring back the bureaucracy, and would not benefit the overall organization. It may temporarily improve the control of the work (efficiency), at the expense of production (effectiveness).

The answer we suggest is based on centralizing functions that create efficiency and control of work, and decentralizing functions of work effectiveness. See the accompanying section “A Model for Organizing Maintenance.”

Thus, the centralized functions would include work prioritization, planning, and scheduling; preventive and predictive processes; compliance with standards; central reporting; and skills assurance.

The decentralized functions would include response to immediate needs and prioritizing and scheduling area resources.

This organizational scheme would meet both criteria:
Work identification. Only the area can be expected to identify the totality of the work. Problems not recognized do not get attention.

Work prioritization. Prioritization is a shared function. The unit places a relative prioritization on the work. A global system of prioritization must be maintained that works across all units, however, or there is no assurance that resources will be working on the “right stuff.”

Work planning. The planning function is done primarily to improve efficiency. Planned work is typically measured as requiring one-third of the labor time as unplanned work. The best model we have seen is to have planners centrally located, centrally managed, but dedicated to a unit(s). The planner is less likely to be diverted to other responsibilities, and more likely to have the time for careful analysis. There are other benefits. During times such as vacation, there are backups available to plan.

Planning is a discipline that is difficult to achieve and difficult to maintain. It needs to be nurtured and developed carefully. This is the greatest issue to maintenance improvement in most plants.

Work scheduling. Scheduling is a shared function between the dedicated planner, the pool resource manager (usually the manager of central maintenance), and the unit leader/supervisor. The supervisor is free to schedule his own dedicated resources against the planned work (allowing for unplanned work), and will receive additional resources for work that is identified as global priority.
Work documentation. A key to developing a valuable history is complete documentation of the actual work performed. This is done by the craftsman at the end of each job (to avoid the quit early syndrome) and reviewed by the planner for the area. The planner must be the coach to assure that work is documented according to plant standards.

Work analysis. Planners are the only staff in a position to understand and review the work. Part of work analysis is done by simply reviewing the work documentation. Standard job plans may be updated, chronic problems flagged, materials and parts issues noted, and future RCM, FMEA, or root cause analysis needs identified. In addition, planners become very familiar with the analysis and reporting tools available through the CMMS, and can most readily scan history for recurring equipment problems.

Preventive and predictive work. To assure that this work gets done consistently, we have seen the reliability team most effectively used reporting to a central leader. As in planning, these people must become specialists, and learning and helping each other is a key to success. This function would report centrally.

Information tools, reporting, and compliance/performance audits. Providing information tools, such as maintaining the CMMS, reliability tools, making the reports for reliability and Key Performance Indicators (KPIs), performing analysis, and audits are all functions that would have central oversight or be performed centrally.

Area maintenance

One of our clients calls the craftsmen reporting directly to the area “Min. Crews,” short for minimum crews. The concept is that the crew is able to handle the minimum average workload of the unit. One method to identify the appropriate staffing level would be to examine the amount of work done in the units during the 10 weeks of the year in which the least hours are recorded by the unit and staff to that level. The objective is to keep as many staffers available to the central group as possible for outage work, etc., and to staff just enough to keep the units operating at an optimal level.

This group becomes identified with the unit where they work. Their goals have less to do with typical maintenance KPIs which are efficiency and complaince-based, but more directly with the production goals of the unit. As such, they often act as the SWAT team to handle immediate work. They also work on the annoying problems of the unit that would never hit the high priority list of the central priority system.

Their interaction with operators is mutually beneficial. Operators more readily participate in “maintenance” tasks when the crafts performing the work are “their guys.” The craftsmen learn the intimate details and idiosyncrasies of the unit’s equipment, and become expert in restoration of function. In the best cases, they routinely remove the sources of work

(chronic problems) from the units.

The downside of this union is twofold. First, the craftsmen are not maintaining their skills because their work is “Jack of all trades.” Second, a schism grows between the area and central groups. We have seen this problem resolved through a periodic rotation of staff through the area.

Scheduling of work is a primary responsibility of the area. This is typically handled in a weekly planning meeting between the unit-dedicated planner, the assigned maintenance coordinator, and the unit production supervisor.

The planner has issued a list of planned work to the parties ahead of time. They come to the meeting with prioritized work lists that they reconcile, creating the work list and schedule for the following week.

Area maintenance has contributed a great deal to the effectiveness of manufacturing among our clients in North America. In many cases, however, these plants have dismantled the central organization. Reestablishing the efficiency and control functions under a central organization can help plants improve the total amount of value-added work contributed by the maintenance staff. **MT**

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