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This article is what I had to say about maintenance about 20 years ago.

The Battle of Maintenance

Maintenance is war. Your enemies are the triumvirate of breakdown, deterioration, and unplanned events. Your soldiers are the maintenance department and as many civilians as you can recruit. The civilians you protect are production workers, office workers, drivers, and all the other users of your organization's assets.

Military historians study battles to identify the pattern of conditions that dominated the outcome. The conditions can include topography, enemy force size, morale, the fighting force's skill and motivation (were they defending their homes and families?), ordinance available, the opposing general, and hundreds of other factors. Any one factor, or a combination, could have contributed to the outcome.

The greatest military disasters usually involve a previously successful strategy applied to an inappropriate pattern of conditions. The pattern that the Russians confronted in Afghanistan did not fit the strategy they had used successfully in other theaters of operation. A heavy concentration of troops and artillery could not dig out a dedicated people fighting for their homeland in the mountains there. Similarly, American strategies in Vietnam didn't fit the pattern (topography, morale, motivation, our allies, and so on) and were therefore compromised from the outset.

As maintenance leaders, we have many strategies and weapons at our disposal: some new, some old, some complex, some simple, some effective in one theater of operations, and some better in another.

Each strategy to consider works only with the support of the correct weapons and logistics. The Nazi blitzkrieg depended on air support to soften the ground resistance. Without air power, the strategy would have failed. Each strategy and weapon system has the logistical support for optimum kill power. Tanks without fuel or troops without food are compromised and ineffective.

Dominant pattern

To choose the best strategy, maintenance leaders must recognize different patterns. The patterns include accepting the weaknesses and strengths of the current plant, crew, management team, attitude, equipment age, purchase policies, and business and political conditions. You proceed in pattern matching without assuming that you can change the department. You proceed from where you are today.

If your department is purely knee-jerk reactive, the best strategy might be to build the department into the best fire-fighting force in your industry and support what is already strong in your corporate culture. Don't worry that the approach might counter the current trade-press trend, which declares that the ultimate solution is some exotic monitoring technology. The tools available to identify the dominant pattern are economic modeling, component-life analysis, failure curve fitting, equipment-life-cycle review, surveys, exception reporting, and looking at the legends of the maintenance effort.

Strategy

A single factory fleet, shop, or property management company uses several strategies simultaneously. Each is best -- given the right situation and equipment.

Different equipment responds to different strategies. It would be best to allow an isolated low-tech machine with low downtime cost and exposure to break (ignore it until breakdown), while you might look intensely after a mission-critical assembly line in the same plant.

Below, you'll see a list of sample maintenance strategies that are commonly used. Some are partially adapted from Uptime by John Campbell, published by Productivity Press.

Support

Starting a PM system without trained people who have the time and tools (to find and correct deterioration before breakdown) is like fighting a battle with guns but without bullets! Strategy without support will fail.

Each strategy needs certain types of logistical support. In a war, troops need food, bullets, medical care, bathrooms, sleep, and many other types of support. Armies can play around with the support within narrow boundaries. Troops, for example, can fight hungry, tired, or hurt.

However, their effectiveness is compromised as more and more support is lacking. In maintenance, the choice of strategy depends mainly on the level of logistical support that the maintenance department can expect from the organization.

Maintenance logistical support includes people, parts, systems, space, tools, good advice, company backing, training resources, equipment access, information access, and time. Each strategy needs characteristic resources.

An example of adequate support for preventive maintenance would be providing time to do inspections when nothing is wrong. In addition, sometimes you need a clerk, a computer, or a specialized tool. In other cases, you need control of the equipment and the willingness to take downtime.

Calling a duck a cow doesn't change anything!

Many companies install a computerized maintenance management system (CMMS) to catapult themselves from a strategy called bust 'n' fix (ignore the asset until it breaks) to one called proactive maintenance (the maintenance action takes place before the breakdown). They make an installation with inadequate logistical support. Then, they wonder why they still have so many unplanned events. Changing the window dressing, name, or how you report does not change the pattern.

The problem lies in the absence of support for the strategy. In this case, the current strategy is stomped out, and a new one is superimposed without adequate support (in most cases, with limited success).

In any war, human frailty is one of the enemy's greatest allies (in Korea, more soldiers died from Jeep accidents than from enemy fire). In maintenance, dangerous human frailties include ignorance, inattention, fatigue, laziness, arrogance, somnambulism (sleepwalking!), stupidity, false economy (unthinkingly going with the lowest bid), institutional rigidity, and corporate gluttony.

Conclusion

One size does not fit all. Computerization, RCM, PM, or whatever, is inappropriate for all maintenance situations. We must look closely at what is happening in our factories, fleets, and buildings. We have to accept our weaknesses and our strengths.

You can build a robust maintenance department by capitalizing on your strengths and working on your weaknesses. You can get substantive and permanent improvements by building on what is there. That way, PM meshes with what you have rather than with some idealized and unrealistic notion of what might be.

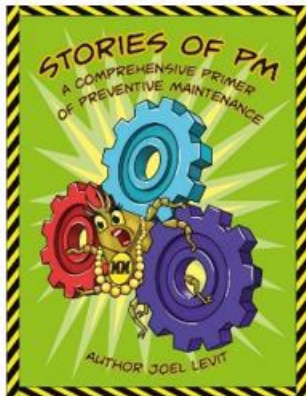
Executive Summary

Maintenance is war. Its enemies are the triumvirate of breakdown, deterioration, and unplanned events. Your workers are the maintenance department and as many civilians as you can recruit. The civilians you protect are production workers, office workers, drivers, and all the other users of your organization's assets. As maintenance leaders, we have many strategies and weapons at our disposal: some new, some old, some complex, some simple, some effective in one theater of operations, and some better in another. Many companies install a computerized maintenance management system (CMMS) to catapult them from a strategy called bust 'n' fix to one called proactive maintenance. Computerization, RCM, PM, or whatever, is inappropriate for all maintenance situations.

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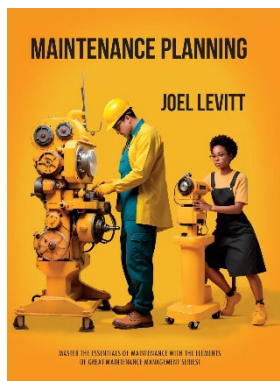
Defect Elimination



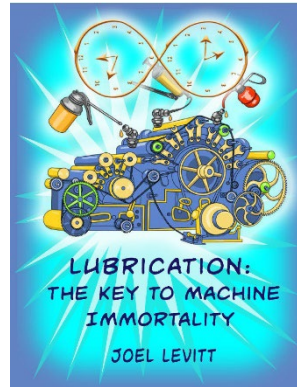
Reliability and fundamentals



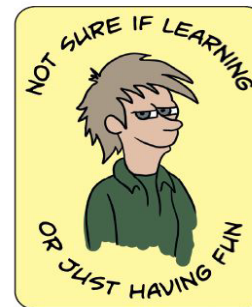
Maintenance quality



Maintenance Planning



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