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Maintenance
Management
Newsletter

"How can I get my executive management to understand the disastrous effects of OTF?"

Predicting the Exponential Costs Associated with Breakdown Events

By David Tod Geaslin
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Before World War II, less than 5% of the population had a college degree of any kind. About half were educators and the other half were science, business, and engineering degrees. From the beginning of the Industrial Revolution until this point, the Maintenance Manager operated from a place on the organization chart just below the President of the company and alongside the Marketing, Accounting, Engineering, and Finance Managers. The probability is high that none of these key decision-makers who had come up through the ranks had a degree.

Then came the end World War II and the GI Bill that offered a college education to millions of our service men and women that they would have never exercised without the assistance. It was a wonder-stroke for our country. Colleges and universities had to spool up from basically a cottage industry servicing thousands to a mass production industry servicing millions. This all happened in a time where knowledge was increasing exponentially and to assure a quality product the universities selectively taught what they could prove to be true. Every educational discipline bloomed including the business and engineering schools that were turning out degreed professionals.

However, there were areas of knowledge that did not prosper and almost all of them were associated with nonlinear events. Remember how much time we spent on linear equations in algebra? Do you remember how much time we spent on nonlinear equations? It was usually one sentence from the teacher, *"Nonlinear equations cannot be solved because there are too many variables to calculate."*

It turns out that the function of maintenance is nonlinear. There are thousands of variables associated with managing maintenance. Everything from the quality of the raw materials used to make a machine to the machine operator are so unpredictable that the prediction of when a machine will fail and how much it will cost is an impossibility no matter how many accurate data points are collected.

When the universities realized this, they quit teaching the management of maintenance as a discipline and no college degrees were offered. The disciplines of management, marketing, finance, accounting, and engineering surged ahead, churning out degreed professionals. As HR Departments adopted the requirement for a college degree to be in management, the maintenance professionals fell further and further down in the organizational chart and away from the ear of the President. Soon the Maintenance Department was so far away from the planning and decision-making that the department was reduced to being reactive to every new effort executed by the company.

Simultaneously, the country was going through a seemingly unrelated transition. It was the loss of the corner full service gas station. Following the energy crisis of 1974, the self-service gas station/convenience store ascended and the primary source of mechanical training in our society, the corner gas station, was lost. During the following decades the accounting executive that had worked in a gas station and garage in high school or college began to retire and their associated knowledge of how machines work and what should be expected of them was lost.

The degreed professionals that replaced them are no less intelligent or capable; however, they have almost zero experience with the physical experience of maintaining equipment and the knowledge they need to be effective. Within

their company, the maintenance knowledge they need is buried so far down in the organizational chart that quick and efficient communication during a time of planning or crisis is unavailable. Consequently, operational decisions are made that maintenance cannot support.

It is important that the executive levels of management have access to the information they need to manage the Maintenance Manager effectively. During my fifty years of experience in the management of maintenance, I have devised several tools to get best decision-making information possible into the hands of the executive leadership.

These tools are very effective because they offer financial progressions and ratios associated with deferred and breakdown maintenance events. They offer an understanding of the exponential penalties for allowing an asset to operate to failure (OTF) in a brief and concise package. Executives can make the best decisions when they see the cost and risk/reward matrices for deferring maintenance and allowing an asset to operate to failure on a one page worksheet. If they do not wish the company to be exposed to the risk of OTF, then a planned and organized early intervention can minimize the disruption to the process.

I offer these tools and the decision-making knowledge can be condensed onto a one page Excel spreadsheet. They both depend on gathering historical information on past breakdown events and entering the cost data into the spreadsheet. Executive management must identify all the money spent on the breakdown event for the ENTIRE ORGANIZATION not just the maintenance work orders. When all the breakdown event Direct Maintenance Costs, Indirect Costs, and Intangible Costs are accumulated and entered into the spreadsheet it will compute these two functions:

The True Risk/Reward Ratio for Deferring Maintenance – When all the historical costs have been totaled and divided by an Early Intervention Cost the spreadsheet will generate a ratio for letting a machine operating to failure for the whole organization. Most executives think this ratio is two or three times the cost of early intervention but this ratio is seldom less that 40:1 and routinely as high as 80:1. So, if the Maintenance Manager presents a request for money or downtime to exercise an early intervention costing $1,000 and presents the leadership with a historical ratio for that process of 60:1 if the machine is operated to failure, it becomes easy to make the decision. Defer a $1,000 repair today or be willing to defer the maintenance and accept the risk of a $60,000 breakdown event if the machines should fail in operation. An additional decision point generated is that the maintenance man/hours ratio is fifteen times more to repair a machine operated to failure than the early intervention.

When an immediate need for a maintenance decision is required from an executive they can start by saying, “Show me the risk/reward ratios for that process.” If the ratio of risk is unacceptable they can execute an Early Intervention plan.

The Inverse-Square Rule for Deferred Maintenance – Computations for this value is embedded in the worksheet and is computed using the cost figures above. It shows the sequence of exponential cost escalations at each escalating level of the breakdown event and breakpoints where management can intervene to stop or prevent the damage.

If the executive leadership of an organization can have access to these two basic tools, they can effectively understand the disastrous effects of operating to failure (OTF) and be willing to support the Maintenance Manager with planned and decisive Early Intervention events.

The author:

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