

Management side

Stopping uncertainties from wreaking havoc on maintenance projects

In many ways, the traditional CMMS or EAM system works somewhat like a computerized PERT chart. It is based on traditional methodology, which asks you to identify the tasks that need to be done and determine how long the tasks should take to do. You then attempt to finish each task within the allotted time and hope all projects finish on time so that you don't have to rearrange the chart.

Unfortunately, this methodology ignores the very simple fact that there are many uncertainties in maintenance, repair, and overhaul projects. For example, there are unexpected surprises. Projects are continually assaulted by uncertainties, such as changing requirements, technology failures, vendors not delivering, work materializing slower than expected, slow approval cycles, and changing priorities. Some tasks take longer than expected. Resources working on one task may be needed somewhere else.

These uncertainties quickly multiply and destroy schedules. As they become realities, resources planned for one project are used to fix other projects. A cascade effect takes place in which delays propagate but gains do not add up. Delays compound so people are pulled in multiple directions and begin multi-tasking. Soon, all con-



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trols and plans dissolve.

To avoid such problems in the next project, management requests a more detailed plan. Now, there are even more details to track and defend. To assure that they won't be called on to excuse their failures on the next project, managers at all levels hide safeties in their plans before sending their commitments upward.

Nonetheless, the same uncertainties that torpedoed previous projects are realized, causing the same results. The quality of your maintenance goes down, and costs go up.

projects and give everyone access to common data that will allow many people to make project-related decisions. What they sometimes miss is that alone is not enough; one needs to have a mechanism in place to deal with uncertainties.

Theory of Constraints solution to managing uncertainties

Uncertainties can't be wished away or ignored. But project management software can be made useful by providing a way to accommodate and manage uncertainties by adopting the proven and practical principles of Dr. Goldratt's Theory of Constraints (TOC). For the last 20 years, TOC has

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Project management software has not really helped for this very simple reason - it ignores the uncertainties of projects and does nothing to prevent it from wreaking havoc. Yet, this is a basic requirement in a plant operation.

People intuitively understand that if you want multiproject management, you need to go from desktop management tools to a solution with a central database where you can input all the

been primarily used to streamline manufacturing and distribution. However, TOC scheduling is now also revolutionizing how MRO (and other) projects are managed.

In production, the Theory of Constraints holds that there is one critical operation in every organization that would cause massive bottlenecks if it were to go down. Therefore, the entire organization should focus on feeding

that constrained operation. One way of feeding that critical operation is to build buffers — either of time or materials — in front of it so that it never is forced to stop working.

Here is how the concept is applied in projects. In the project plan, buffers are placed at critical points — where noncritical paths meet critical path — to create room to absorb uncertainties. These projects are released for execution based on the availability of overall constraints.

This ensures that schedules at non-constraints have room to absorb uncertainties. During execution, the rate of consumption of these buffers is monitored and used to set task priorities — both within and across projects. This ensures that available safeties in projects are used judiciously to get projects to finish on time and provide people with clear priorities to avoid multitasking.

Safety engine

Software is now available that automates it. A “safety engine” makes room for uncertainties in your projects with blocks of unscheduled time, called buffers, placed at a few critical

junctions. These buffers absorb and lessen the shocks of uncertainties. Since you cannot afford unnecessary buffers, it puts buffers only in those few critical places where absolutely necessary. With unscheduled time buffering the right places, people have no reason to hide safeties at multiple levels. Your commitments are now more aggressive and based on reality.

As uncertainties strike in execution, work gets delayed, and the unscheduled time gets used up. The safety engine then calculates how much of the unscheduled time is still available for future uncertainties and accordingly sets priorities for everyone, including managers.

A natural question that many people ask is, “Don’t buffers increase project length?” To the contrary, project plans created with a TOC-based safety engine are more aggressive.

Remember, managers are no longer hiding safeties in their commitments. The safety engine puts buffers only in a few critical places where absolutely necessary. With unscheduled time buffering in the right places, there is no need to hide safeties at multiple levels.

Importantly, there is typically only

one buffer for a series of tasks, whereas safeties are usually embedded in each task. Thus, the aggregated buffers are much more efficient than individual safeties.

Bottom line: not only does the safety engine help deliver projects as planned, but throughput also goes up. Cycle times come down as well.

In addition, such an approach also provides enterprise software benefits. For instance, by automating repetitive tasks and processes, so common in maintenance, this methodology cuts the administrative overhead typically associated with managing project operations. By leveraging the latest advances in computing technologies, such as web-based browsing, it also minimizes the IT effort required for initial deployment as well as **PE** ongoing maintenance.

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