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Zero Based Maintenance Budgeting

There is tremendous pressure on maintenance managers to improve their budget performance.

Traditional budget methods do not seem adequate in Maintenance because expenditures comprise thousands of seemingly unrelated events. Maintenance is not volume-related (higher output equals higher Maintenance).

The breakdowns and other maintenance activities are hard to predict and do not necessarily reflect what happened last year. To successfully budget (and therefore predict) maintenance expenditures, we must divide the maintenance demand into elemental parts.

A zero-based budget breaks the overall demand for maintenance services into its constituents, assets, or areas. Look at each asset (or group of like assets) to determine the maintenance exposure. In addition to the unit or asset list, a zero-based budget allocates certain areas that are hard to define as individual assets, such as the electrical distribution system, paved parking area, and sidewalks.

Prior computerization of Maintenance simplifies the construction of a zero-based budget. The computer can quickly generate an asset and area list. Many systems allow you to create classes of equipment where similar equipment is aggregated into one line.

You can attach the hours and material dollars for each asset and area if the system has been used for over a year. Some systems have a reason for repair (see chapter on work orders). The reason for repair would roughly correspond to the categories below. Most systems allow the export of the files to a spreadsheet for further manipulation.

All maintenance activity can be traced to one of the following eight demands. Shops that are craft-dominated have a more complicated problem. After the budget is completed, they must return to the individual demands and break out the labor by craft.

The eight reasons for maintenance resources are:

1. PM- preventive maintenance hours/materials. Based on your facility and equipment size, use, construction, and the PM activities' standard times, you can predict how much time and materials PMs will take. In a TPM shop, some of the PM hours will be provided by operators. The most straightforward formula is multiplying the number of services by the time for each service. Also, look at the materials used for each service. Include some time for the short repairs the mechanic will complete during the PM. Since you have some flexibility in scheduling, you can consider PMs as a level of demand throughout the year.

Specifically, PM work includes all the inspection, adjustment, bolt tightening, oiling, cleaning, and readings initiated by task lists. The task lists are initiated periodically (quarterly, annual).

2. CM-corrective maintenance hours/materials. They are also called scheduled repairs or planned Maintenance. As your PM inspectors inspect each part of the facility and all equipment, they write up repairs (deficiencies). These write-ups become your backlog of corrective Maintenance (CM) for your maintenance schedule. The repairs are considered scheduled repairs as long as they don't interrupt jobs in the process.

You can look at previous years to get an idea of the hours for this activity. Since you have control of the schedule this demand can be considered level throughout the year. These scheduled repair hours are inserted by equipment, group of like equipment, or area.

This type of work has a tremendous advantage because you can plan and accumulate several jobs for a location, schedule them together, or assemble several jobs with the same materials or craft (fix all the minor roof problems at several locations) simultaneously. I estimate that you will save 5 hours on the site for every hour spent planning these scheduled jobs.

3. UM- all types of user maintenance (hours/materials) are all requests from users/customers, from the routine broken pulley on a conveyor to a \$1,000,000 catastrophic breakdown. Included are UM-R (Routine work), UM-P (Small projects), and UM-B (breakdowns).

UM is the most common source of work in a breakdown-driven organization. Without inspection and inspections, the users will find problems first. Users are also the first to find vandalism, breakdowns, and other damage. Responsive user complaint handling is essential if you are to be viewed as effective. Most users will judge you entirely on how you respond to their complaints (other benchmarks usually don't have as much impact on their quality of life).

UM includes both breakdowns and routine service requests. UM includes servicing minor user requests for hanging pictures, moving furniture, and other personal services.

At the beginning of the year, the budget is the same number of hours for UM as the previous year by asset or category. At the end of the year, you can back off the emergency component of UM as the PM system starts to take effect. For budgeting purposes, UM creates a level of demand. Emergencies will tend to bunch. Many factories use outside contractors to level the demand for UM. This work will look increasingly level in more extensive facilities unless the UM demand is related to an outside event (like a forest fire). See seasonal demands (SM) for a particular case of UM demand.

4. SM- Seasonal Maintenance hours/materials. Seasonal Maintenance includes all particular seasonal demands. Your entire grounds maintenance effort is undoubtedly driven by season. Review of roofing systems before summer and winter or checking air conditioning before summer are seasonal demands.

Some businesses are seasonal. Cleaning the Candy Cane line before it starts in July would be a seasonal demand. You can also use this category to pick up some percentage of the seasonally driven emergencies or seasonally driven PM budget hours at the beginning of each season by asset or group based on history.

5. RM- Replacement/Rehabilitation/Remodel Maintenance hours/materials. In some organizations, this category is capital improvement and is handled outside the regular maintenance budget.

RM also includes all maintenance improvements and efficiency improvements. At some point, units that have not been maintained or have reached the end of their useful life will have to be rebuilt or replaced. The rebuilding effort should be added to your maintenance budget as a capital replacement line item separate from any current maintenance activity. The hours must be budgeted if your people are modernizing to bring units up to PM standards.

Since you have control of the rebuild schedule, you may be able to use rebuilds as a crew balancing tool. A special case of RM is Management decision. This work is generated by a manager when they decide to change something in, on, or around a machine, another asset, or the building. The reasons for the decision might range from energy efficiency, improved usage, legal problems, or even a whim (I hate yellow presses, paint them!).

Maintenance demands for the whole operation are (not tracked by individual but by location). After the base demand is cataloged by equipment or area of the plant, look into some of the budget busters below. A well-designed budget can be ruined by excessive social demands generated by visiting dignitaries or a large construction project's effect on the rest of your operation.

6. SD- Social Demands (sometimes known as hidden demands because they don't always show up on work orders). This is also called PS for Personal Service. Your primary mission is to maintain the equipment and facility. You may be called upon for other duties in your organization. These duties may include supplying clean-up people, running tours, preparing for visiting dignitaries, setting up special events (like running sound cable), providing chauffeur services, picking-up or delivery of papers or packages, organizing picnics or working on non-organization equipment and facilities (charity work). Estimate your hours for these activities.

7. ED- Expansion demands. Any expansion in the size of your facility, size of your workforce, and additions to the scope of your control will add hours to your overall requirements. New buildings, assembly lines, and significant changes to the plant require start-up time. New facilities disrupt current activities and take up direct time. Adding satellite facilities will result in additional lost time until systems are in place. Estimate additional time if an expansion is contemplated.

8. CD- Catastrophic Demands. It seems that every location has characteristic catastrophes. Add time for one or two catastrophes. You can review your records for the time spent in a typical disaster. This accommodation can include floods, hurricanes, trucks taking out the side of the buildings, fires, etc.

How to Set up a maintenance budget

1. Start the process by compiling a list of all your machinery or equipment. As much as possible, arrange the list by department or cost center. This arrangement will facilitate report printing at a later stage. Print an asset or equipment list if you have a CMMS (Computerized Maintenance Management System). This list might have as few as hundreds, thousands, or more entries, depending on the size of your plant.

2. Add areas of the plant and site that require maintenance resources that don't lend themselves to the unit concept. Typical areas include roofs, pavement, electrical distribution systems, piping, doors/windows, etc.

3. Look at the list and see if any units can logically be grouped. A wire harness assembly plant might have 50 braiding machines of similar usage and vintage. These could logically be aggregated into one line. Putting similar units or areas together simplifies the process and makes predictions more accurate.

4. Collect any maintenance data available by unit or area for several years. Your CMMS would facilitate this step. If the data comes from the CMMS, see if it has export capability. Some systems will send data to spreadsheet files without re-entry. Inquire if your accounting or cost accounting group can shed any light on the costs to maintain certain areas, departments, assets, or production lines.

5. We recommend this whole mass of information be designed in a computer spreadsheet Excel. Create a template to duplicate the form at the end of this section. The equipment, areas, and groups of units/areas are listed in the template. An alternate recommendation would be to enter the data into a database manager. There are advantages to both approaches. Most budgets are run from spreadsheets.

6. After the individual units and the general assets are listed, add the global lines (that apply to the whole site), social, expansion, and catastrophes. Look into your history or estimate the impact of these areas. Depending on the need, the three areas can be added as hours and materials or as percentages. If these areas have traditionally been non-work order items, now would be an excellent time to set up the codes to put them on work orders. Once accounted for, these costs can be studied year to year.

7. Once assets have been inserted into the template, this document becomes the basis for your zero-based budget (be sure you back up the filled-in template). You have many hours in at this point, so make your backups now and keep them updated! The other point is that this computerized list might have different uses, so a copy might be helpful for another reason.

8. Review each unit, area, or group and estimate your PM, CM, UM, RM, and SM costs and hours. A usable history of the expenses from accounting or the CMMS dramatically simplifies this process.

9. Add in your estimates for SD- Social, ED-Expansion, and CD-Catastrophe-related demands against the department. These can be percentages of the above areas or actual hours and material costs.

10. Your material costs are the sum of all material columns; your hours are the sum of all hour columns. You would then apply the costs of your labor, fringe benefits, and maintenance overheads to determine your budget.

When management wants reductions to your budget, you have a new level of discussion. All changes regarding higher or lower service levels on individual assets or areas must be justified. Now, when cuts are needed, you can talk about which assets will be allowed to deteriorate or which departments will not be served.

Almost every business has deferred Maintenance. You may see a problem slowly developing and put off the work. You could be short of funds, planning a major rehabilitation, planning to sell the unit or property, or lacking the requisite skills. Some organizations run their whole operation with excessive amounts of deferred Maintenance. Distribute your zero-based budget to the users, staff, and top management for comments.

If your actual hours are only a small percentage of your budgeted demand, then something must be done. Either deterioration is taking place; your customers are unsatisfied, or both. One solution is to use contractors to make up for the shortfall. Some organizations are using this strategy to maintain maximum flexibility.

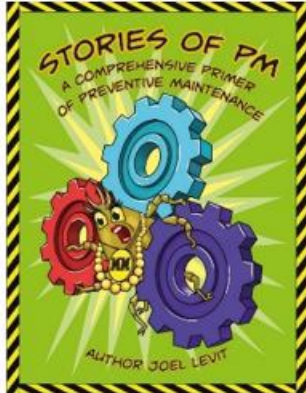
Using the budget to schedule the need for outsourcing

Some organizations use outsourcing strategies where they crew for 75% to 80% of demand and use outside vendors during peak periods. The most effective way to predict the need for contract labor is to recast the budget every month. You can see which months will exceed your crew's available hours using the monthly hours.

The process is like a staffing exercise. If your core crew has 1400 hours available monthly, the contractor would have to supply and labor above 1400 hours. The budget will show which months will likely be needed for contracting. Moving project work can minimize contractor needs in a given month.

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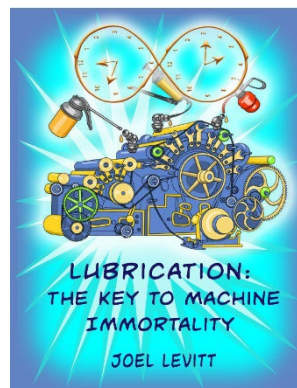
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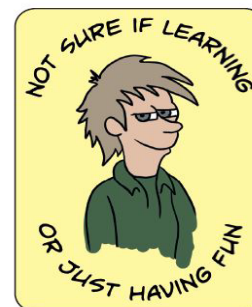
Maintenance quality



Maintenance Planning



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