

Planning & Budgeting for Preventive Maintenance

White Paper

Investing in automated material handling technologies without planning for ongoing maintenance costs is like buying a new car and never changing the oil. Here are eight areas to think about when building your plan and your budget to mitigate the risk of downtime.



Introduction

Companies investing in automated material handling equipment for their distribution center, warehouse, manufacturing facility or other operation don't always think beyond the sale price and anticipated benefits of higher productivity, increased throughput, reduced reliance on labor, better accuracy and more when signing the purchase contract. But you should also be budgeting for ongoing preventive maintenance to ensure your new investment remains in peak operating condition for as long as possible to maximize the equipment's lifetime value and return on investment (ROI), as well as to mitigate the risk of unplanned downtime.

According to *Modern Materials Handling's* 2018 Annual Maintenance, Repair and Operations (MRO) Survey, 94% of respondents confirm budgeting both time and dollars for these activities are either extremely or somewhat important, noting doing so "helps their firms maintain customer satisfaction, maintain continuous production, follow lean practices, reduce downtime, manage preventative maintenance and streamline their plants... 'Machines not running means product can't be made,' one survey respondent said, 'which means money can't be made as well.'"¹

The costs of NOT planning and budgeting for a regular, ongoing preventive maintenance program can account for as much as 40% of a facility's operational budget² when addressing issues, failures or shutdowns on an emergency or corrective basis only. Those costs represent not only lost labor costs and lost revenue, but also customer service costs such as delayed shipments, overtime pay, late delivery surcharges and any rush or overnight shipping costs to compensate. Additionally, by planning for routine maintenance activities, downtime can be scheduled to minimize the operational impact and inconvenience—as well as significantly reduce the risk of a complete unanticipated failure.

Think of it like owning a car. You wouldn't wait until all four tires were so worn they no longer grip the road before buying new ones, or only replace the oil when the engine stopped working. If you did, the total repair costs—and the inconvenience of having an un-drivable car leaving you stranded on the side of the road—would vastly outweigh the costs of budgeting, and convenience of planning, for a regular tire replacement and routine oil changes.

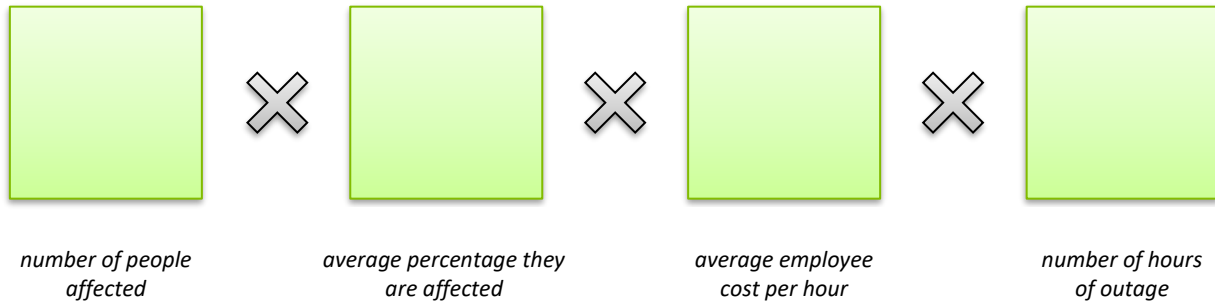
¹ McCrea, Bridget. Modern Materials Handling. "Annual Maintenance Repair and Operations (MRO) Survey 2018: Spending on the rise." www.mmh.com/article/annual_maintenance_repair_and_operations_mro_survey_2018_spending_on_the_ri/mro

² Jackson, Martin. *Process Worldwide*. "How Effective is Preventative Maintenance in Saving Money?" www.process-worldwide.com/how-effective-is-preventative-maintenance-in-saving-money-a-415850/

Figure 1: Calculating The Potential Cost Of Downtime

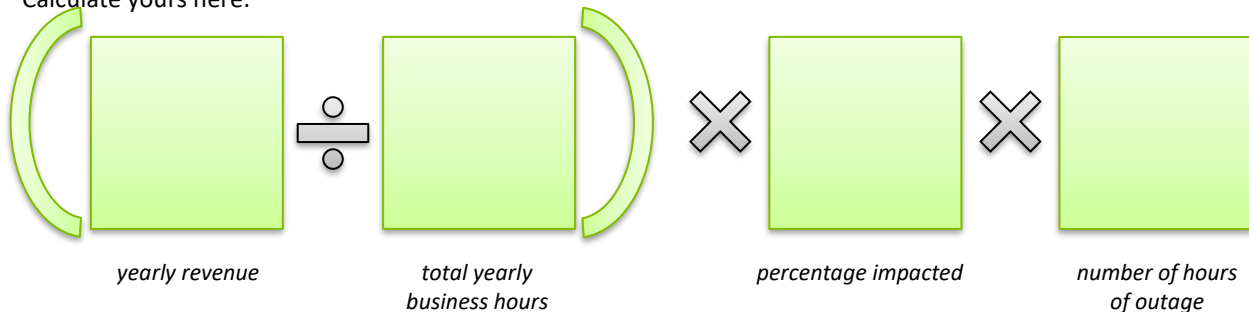
Labor Cost = P x E x R x H

Calculate yours here:



Lost Revenue = (GR/TH) x I x H

Calculate yours here:



Service Costs

Further, and harder to calculate, are service costs. These might include:

- Late delivery surcharges from customers
- Overtime pay required to compensate for productivity losses
- Delayed shipments that result in decreased customer satisfaction or loss of customers
- Rush and overnight shipping costs associated with requiring a needed service part not maintained in MRO inventory onsite

After adding up those (and other) service costs, divide the total by the number of hours of system downtime to calculate cost-per-hour.

But How Much Should Be Budgeted?

Unfortunately—due to the vast spectrum of available automation equipment and broad variety of installation applications, environmental circumstances and geographic locations—there is no hard and fast rule of thumb for planning how much to budget toward this ongoing operational expense. Indeed, *Plant Engineering's* 2018

Maintenance Study found the average facility allocates 9.7% of its annual operating budget to maintenance processes, with 34% of respondents allocating between 5% and 10% of budget, 16% allocating between 11% and 15% of budget, and 19% allocating more than 15% of budget.³

Further, *Modern's* 2018 Annual MRO Survey also found:

In 2017, 42% of respondents spent less than \$1 million on MRO products and services, which encompass spare parts and consumables. Sixteen percent spent between \$1 million and \$4.9 million on MRO, while another 12% allocated \$5 million to \$9.9 million for the parts and supplies that keep their plants and factories running. In addition, 43% of supply chain professionals surveyed said they spend less than 3% of their overall supply chain budget on MRO maintenance, while 27% spend 3% to 5%... In 2018, 25% of respondents expect to spend more on MRO products and services than they did in 2017, while 69% will maintain their current spending levels and 6% will spend less this year.⁴

Why such broad ranges? It's because "every organization's MRO requirements are different. Capital equipment selected by a manufacturing firm from a particular original equipment manufacturer (OEM) often requires replacement parts and spares, schematic diagrams, maintenance and user training, and diagnostic tools to be procured from that OEM during the lifetime of the assets."⁵

There are, however, several key considerations that can help inform your preventive maintenance strategy. This white paper offers an overview of eight such areas to consider when budgeting and planning for these types of services.

What factors contribute to the cost of an ongoing maintenance contract?

Multiple factors can impact the budget when structuring an ongoing preventive maintenance and service contract. Among them:

- **The number of identical machines in your operation.** Like anything that comes in bulk, the more you buy, the less you pay per item. It's the same for service; owners of multiple identical pieces of automated equipment can expect to pay less per machine for ongoing maintenance than those who only own one.
- **The frequency of machine use.** Equipment running 24/7/365 will need to be serviced more often and should hold spare parts onsite, costing more overall. Those with infrequent use or low duty cycles will need service less often, requiring a smaller budget.
- **The environment in which the equipment operates.** Machinery used in an ambient, relatively clean operation needs less frequent service. Installations in dusty, dirty or extreme temperature environments (such as coolers, freezers or washdown applications)—or those located in geographic areas which are typically hot, humid, exposed to sea air and so forth—will have special and more frequent maintenance needs, and therefore a larger budget.
- **Whether on-board software is present.** Not every piece of equipment has its own control or operating software, but those that do often require routine updates. The time involved to update, test, validate and

³ *Plant Engineering*. Maintenance Report, March 2018.

www.controleng.com/fileadmin/content_files/pe/Plant_Engineering_2018_Maintenance_Report.pdf

⁴ McCrea, Bridget. *Modern Materials Handling*. "Annual Maintenance Repair and Operations (MRO) Survey 2018: Spending on the rise."

www.mmh.com/article/annual_maintenance_repair_and_operations_mro_survey_2018_spending_on_the_ri/mro

⁵ Trowbridge, Mark. *Modern Materials Handling*. "MRO Strategies: Swamps, alligators and MRO."

https://www.mmh.com/article/mro_strategies_swamps_alligators_and_mro/mro

re-commission the equipment post-update will have costs associated with it, particularly if doing so requires special or additional technicians with software expertise.

- **The geographic location of the facility using the machines.** If the facility is in a remote location, service technician travel combined with holding spare parts onsite, will add additional costs.
- **The overall density of identical equipment in your region.** Authorized service providers tend to work regionally. If there are multiple owners of multiple identical machines in a general area, the regional servicing distributor will likely employ many technicians and even stock an inventory of service parts in that zone. If yours is the only machine in a fairly vast service area, it's not only likely to cost more for a technician to travel there, it will be harder to get on-site support in a timely manner.
- **Time when maintenance can be performed.** If your operations require equipment maintenance to be performed at off times - such as after 5pm or on weekends - there will be additional costs.

How often should preventive maintenance be scheduled and performed?

For new equipment, the OEM may dictate the frequency of preventive maintenance in order to keep the warranty in effect. If not, however, as a general rule of thumb preventive maintenance should be completed on each piece of automated equipment at a minimum of every six months. In extreme environments or situations with high duty cycles, performing preventive maintenance services every quarter is frequently recommended.

When should an operation invest in a spare parts package?

Remotely located operations that are geographically far enough away from a service technician's point of dispatch—or those in a region that lacks a high density of the same machines—would be wise to keep a package of critical spare parts on-site. Additionally, facilities that require 24/7 maintenance response should additionally invest in a spare parts package.

Operations of critical nature, where downtime would negatively impact the supply chain, should keep a spare parts package on-site to safeguard against a lengthy production shutdown. This ensures that the most commonly needed, or critical, parts are available should the technician not have them on their vehicle, nor will they have to be shipped from the OEM if they aren't stocked locally.

What items should be included in a service contract?

Facilities whose operation is a critical element of ongoing productivity, should invest in a 24/7/365 service contract as an enhancement to their current automated equipment warranty. Standard warranties typically only include services provided between 8:00 a.m. and 5:00 p.m., Monday through Friday. Also, read the terms of the agreement carefully. It is less important that the service provider's technician arrives at your doorstep in fewer than four hours than it is to have a **qualified** technician arrive within a day who can fix the problem quickly. Further, if investing in a 24/7/365 service package, a spare parts package is also often recommended to safeguard against any potential delays in getting the necessary components on-site.

Who should perform automated equipment maintenance?

Although many operations would prefer to have their in-house technicians perform all MRO activities throughout a facility, including work on automated material handling equipment, "automated systems maintenance continues to raise challenges for operations managers, with 27% agreeing that automated materials handling systems are

becoming harder to maintain (58% are neutral and 15% disagree with that statement)... Thirty-seven percent of respondents say they have a difficult time finding the technical skills needed to maintain their systems, thus revealing a true knowledge gap for technicians who are being asked to manage this state-of-the-art machinery and equipment.”⁶

For that reason, the majority opt to “leverage the power of strategic supplier relationships: No matter how competent our own MRO product management practices, the capabilities of key MRO distributors are usually more sophisticated.”⁷ That’s because service technicians working for OEM-authorized third-party maintenance and repair solutions providers possess not only a broad range of training qualifications relative to specific equipment, but they also work on these machines every day. Moreover, most automated equipment is extremely reliable; that means even if internal technicians are trained on how to maintain and repair the machines, the likelihood is they will rarely—if ever—need to do so. And, if they do need to service the equipment, their training will likely be out of date and difficult to recall.

Further, many OEMs forbid customers from working on the machines during the initial warranty period; doing so voids the warranty. That said, however, in certain—extremely rare—instances, an OEM might agree to train and certify a facility’s in-house technician to work on the equipment (this can be, however, a very expensive proposition).

It is far more likely that for automated equipment located in a remote area, or one in a given region with a low density of the same machines, the OEM or service provider will equip on-site maintenance technicians with a bit more information and diagnostic training on the machine. For example, by providing details on how to identify and correct the ten most common controller errors that can be caused by an operator mistake; or, by training them to better answer questions asked by remote support technicians in order to more quickly diagnose and assess the degree of severity of an issue. Both approaches avoid the need for in-house personnel to open the machine or service any parts.

What qualifications should a service provider possess?

OEM-authorized technicians have been trained and certified by the equipment manufacturer to service and repair specific brands by machine and control package type. They also receive on-going, updated training—typically annually—as new features and functions are introduced. Conversely, independent technicians who are uncertified have not been properly trained and could cause further damage to a machine.

Further, the best practice is for service technicians to not only be certified to work on your specific machines, but also for them to be trained in all accepted safety practices as established by Occupational Safety and Health Administration (OSHA) Standards. Additionally, some service providers elect to have their technicians certified for fall protection and to operate scissor lifts and forklifts, in case that equipment is needed during the repair or service of an automated system.

⁶ McCrea, Bridget. Modern Materials Handling. “Annual Maintenance Repair and Operations (MRO) Survey 2018: Spending on the rise.” www.mmh.com/article/annual_maintenance_repair_and_operations_mro_survey_2018_spending_on_the_ri/mro

⁷ Trowbridge, Mark. *Modern Materials Handling*. “MRO Strategies: Swamps, alligators and MRO.” https://www.mmh.com/article/mro_strategies_swamps_alligators_and_mro/mro

When evaluating potential service providers to perform ongoing maintenance after the initial warranty expires, what questions should be asked?

In addition to the seven considerations outlined above, ask the following:

Who does the OEM recommend? Most OEMs certify and authorize third-party maintenance and service providers by geographic region. Your OEM will help you determine who the provider is in your area.

Do you stock—or have access to—OEM service parts and replacement components? Depending on the numbers of a given machine within a region, a service provider may stock parts locally, or they may source from the supplier, meaning additional time spent in shipping. Further, only authorized service providers can obtain OEM parts; most independent technicians cannot buy new parts direct from the OEM, and may utilize used parts purchased from a secondary marketplace.

Are your technicians certified to work on my specific machine? As explained in the previous section, best practice is to only allow technicians who have been trained and certified on your equipment to work on it.

What level of service will this equipment need going forward? If your original warranty required a factory-trained service provider to perform routine maintenance and repair work, ask that person for their opinion. They are already familiar with your operation, application, frequency of machine use, environment and any other circumstances that might impact preventive maintenance frequency or the likelihood of unplanned downtime. A reputable service provider will provide an honest evaluation of your needs.

What tiers of service do you offer? Some service providers price their offerings in tiers, giving top-paying customers priority over previously scheduled appointments. Understand what a potential provider will deliver upon in terms of timeframes and the availability of qualified, trained technicians.

When is the best time to commit to an ongoing maintenance and service contract?

The ideal time to commit to—and negotiate the terms of—an ongoing maintenance and service contract is at the time of the automated equipment purchase. Not only is that the point at which the buyer has the strongest negotiating position and is more likely to establish a lower rate than a plan purchased after the contract is signed, but it's also a good time to get clarity from the OEM or distributor about the anticipated aftermarket service needs of the equipment.

Capital equipment acquisitions must be strategically planned and timed to comprehensively address lifetime cost factors. The best time to negotiate ongoing discounts on replacement parts and training is when the initial acquisition occurs. Don't only negotiate with the OEM for the purchase price for the initial equipment purchase and maybe an initial set of spare maintenance parts.⁸

A reputable supplier will help determine the right package and level of services (spare parts, training, remote support, 24/7 emergency service, etc.)—and therefore budget—for each unique situation. They can also help to write the contracts for the capital equipment expense and the post-purchase service expenses in alignment with your company's financial structure.

⁸ Trowbridge, Mark. *Modern Materials Handling*. "MRO Strategies: Swamps, alligators and MRO." https://www.mmh.com/article/mro_strategies_swamps_alligators_and_mro/mro

Additionally, ask for input from the OEM's designated aftermarket service provider about pricing of an extended warranty and/or maintenance and service contract that goes into effect after any initial warranties expire. Arranging those details in advance enables the equipment owner to simplify future budgeting and eliminate complicated bidding processes while ensuring that the machines will be covered continuously.

Want to learn more about how to plan and budget for preventive maintenance and repair services? Contact Kardex Remstar today.

About Kardex Remstar

Kardex Remstar, LLC, a company of the Kardex Group, is a leading provider of automated storage and retrieval systems for manufacturing, distribution, warehousing, offices and institutions. For information about the company's dynamic storage solutions visit www.kardexremstar.com.