

7 Steps To Ensure Equipment Purchases Will Deliver

Written by Jerry Dover, P. Eng., Etobicoke Bakery
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Better planning could help you get out of the “doing whatever it takes to make it work” mode. Wouldn’t that be nice?

It’s an all-too-familiar scenario. A month ago, your head engineer purchased and installed a new widget press for the plant that you maintain. It’s the best in the business, they claim, capable of forming 75 widgets per minute (wpm) with virtually no downtime or maintenance required. Hey, it says so right there in the big, glossy brochure. So, how come this press is only packing 50 wpm in the fifth week of commissioning, you’re spending a fortune to expedite replacement parts from Germany, and you’re keeping the vendor on speed-dial, demanding assembly drawings for this thing on a daily basis?

In the best of these cases, the project leader will work with you and the vendor to get this thing ramped up to deliver what was originally required. In far too many cases, though, the project leader is off to the next project or projects and simply does not have the time to help you get things going. They “sign off” the project as delivered, and now the maintenance department has to scramble, revise and modify, chase vendors, make excuses, curse, and work the usual miracles to please the operations crowd. Honestly, how many of us have been in this situation too many times? And expect to be in this situation again? How can we make sure that for the next new equipment purchase, we will get what we ask for up front and avoid the bottomless pit of “doing whatever it takes to make it work?”

Typically, there are many parties involved in bringing a new manufacturing process on-line. Let’s look at a few broad groups, namely operations, maintenance, engineering and the vendors. A summary of their needs may look like Table I.

Now, in a well-run project, these parties will all come together to discuss the scope and deliverables of the project. At some point quotations will be requested, and the team may review proposals. Once a proposal is selected, the dialogue tends to shift to delivery and installation details. This is actually a very critical point in the project, at which the maintenance and operations leaders need to make sure that the project is really set up for success. That sounds easy, yet it’s not often done. How many of us have asked the question, “What can I do to make sure I’ll really get what I need?”

Toward a better way

The answer to the question is not simple. You can, however, significantly diminish this nightmare scenario through the use of seven basic steps. In this article we’ll look at the basic requirements for purchasing industrial equipment, from start to finish. These

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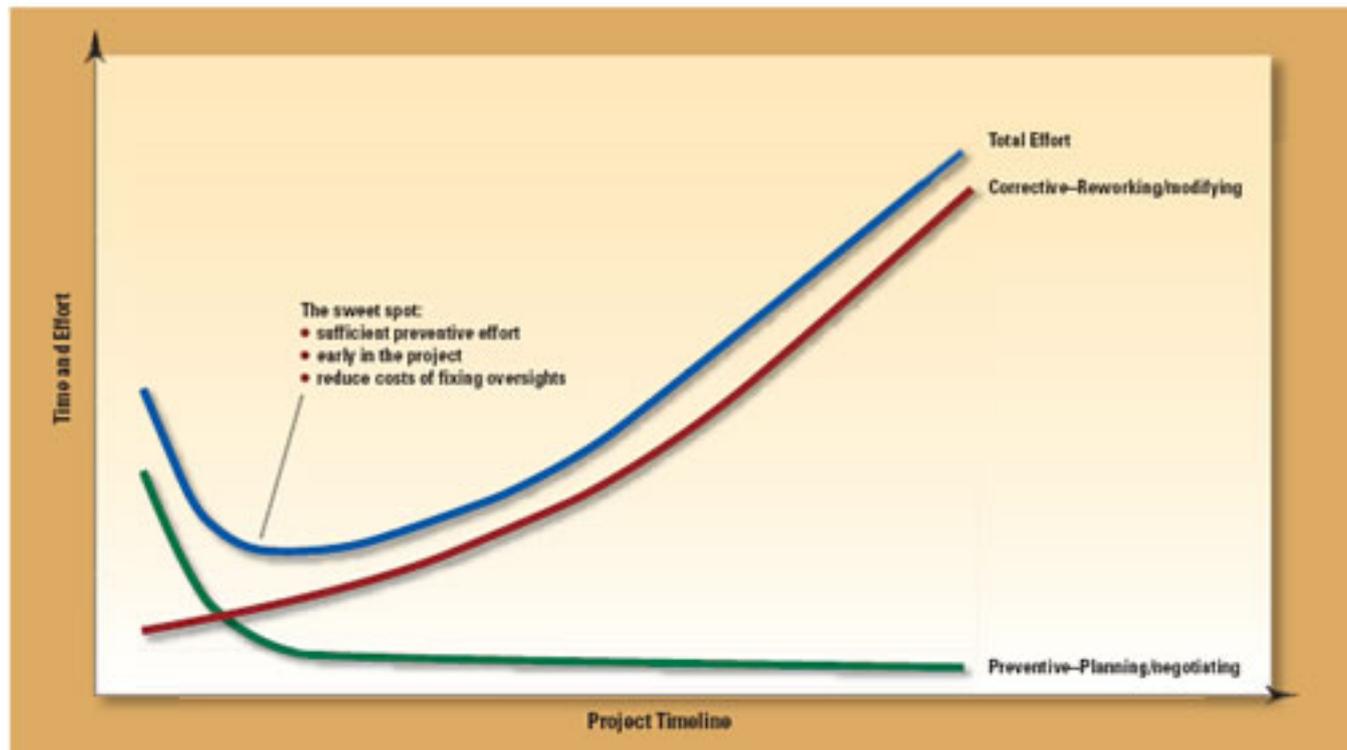
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requirements are quite familiar to you, yet we're going to approach them in a new way, so that we can create a set of guidelines.

These will be guidelines that you as a maintainer or project leader will be able to refer to for future projects. Once again, our goal here is to build a simple, straightforward template that can be adapted to new or rebuilt equipment purchases as the need arises.

Table I. Division of "Burden"

| Party | Financial Role | Performance Needs | Time Demands |
|-------------|---|---|--|
| Operations | Spectator – others should spend whatever is needed | Meet and exceed production requirements | "Just keep me in the loop" |
| Maintenance | Offense – project leader should pay for it all | High reliability, using common parts, easy to service | Moderate project involvement when not fighting other fires |
| Engineering | Defense – must deliver project under budget | Meet agreed-upon production targets | Life revolves around the project |
| Vendor | Sales – must sell at a profit, maintain relationship and reputation | Meet agreed-upon production targets | Spend enough time to deliver and collect payment |



Our guiding principle, familiar to all maintainers, is to apply more preventive effort to reduce later corrective effort. There are diminishing returns to preventive work however, so we seek balance, as illustrated in Fig. 1.

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You've heard of "uptime" and you certainly worry about "downtime." So, to guide us through our seven steps, let's try "**UPP-TIME**". . .

1. U - Understand the need: Clearly understand the required process capability.
2. Prove the claims: Figure out how to measure that capability, and "score" the performance.
3. P – Policies and standards: Determine what regulations must be met and then plan up front to meet them.
4. T - Talk it through: Ensure thorough cross-functional reviews of the detailed design.
5. I - make It win-win: Ensure that the vendor gets all of the information or assistance needed to succeed.
6. M - Make it work: Be well equipped and organized for the installation, commissioning and handover.
7. E - use the right Eyes: Involve maintainers and operators in design meetings, checkouts and acceptance tests.

The benefits to you and to your operations should be pretty evident at this point, and will become more so as we explore these steps in greater detail.

Step 1: Understand the need. . .

If you want to make sure that you get what you want, then make sure that you know what you want. Your whole team should agree upon what the end result will be. By drilling deep into your requirements, quantitative (process rate, capacities, etc.) and qualitative (materials, layout, etc.) descriptions can be developed. These can range from brief statements (i.e., must run at or above 100 F), to detailed descriptions (i.e., must maintain mean process temperature of 105 F with std. dev. no greater than 1.5 F, as measured in the center of the piece at four intermediate points in the oven). If you are dealing with an established supplier of equipment in your industry, from whom you have purchased before, perhaps your requirements can be limited to just a few key needs.

Step 2: Prove the claims. . .

Stating your performance needs is really only going to matter if you can truly measure them. This is the first of many times when your negotiating skills must be sharp. You have identified several needs that must be met, and the vendor will offer you equipment that he/she claims will meet those needs. Now you must figure out how to actually measure the quantitative and qualitative capabilities that you are about to purchase. This is how you will ultimately score the project, so be detailed. Typically this scoring is done while

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commissioning the equipment. If you can push the scoring forward, say to equipment checkouts or trials at the vendor's factory, then that is even better. To help guide you through building the scorecard, first check to make sure that your objectives are SMART (Specific, Measurable, Achievable, Realistic and Time-Bound). Think through the Five Ws and make sure the team knows who is responsible for measuring what, how, under what conditions, and with what instruments. Final acceptance trials are typically done with the equipment installed and running in your operation, so remember that people will have other demands on their time. One option is to have final performance measures done by operations personnel in concert with the vendor, so that all parties can be assured that things are above-board.

Step 3: Policies and standards. . .

Don't assume that the vendor will see to it that your machinery is built to meet all of the codes and regulations with which your company must comply. The project leader, as your company representative, has the responsibility to do that, as well as the obligation to assure compliance with your own corporate policies. If you haven't already done so, it's a good idea to build relationships with the local inspectors responsible for electrical safety, fire and building codes, regulated industries and materials, combustion or pressure vessels, etc. It's also a good idea to get those inspectors involved early in the design stage. If the project manager is reluctant, then why not pick up the initial visits as a maintenance expense—consider it as an insurance payment! This is also the stage where you can make the case for maintainability. Actively seek out and push for those improvements that will minimize future maintenance and repair efforts. Again, put on the negotiator's hat and get the vendor thinking about improvements that can be incorporated into future designs (and no doubt, proudly point out in his/her big glossy brochure).

Step 4: Talk it through. . .

Having a cross-functional team is more than a step in the process; it is an approach that helps throughout every other step. If you're at the table with the project leader and no one from operations, quality, safety, sanitation, etc. is there, then you need to help get them there. These are your customers, so make sure they have input up front—you will save yourself grief later. This is quite important when automating older processes—you want things built, named and indicated so they make sense to the operators and maintainers who will live with it. The vendor's young design engineers in a far-off office simply won't know the technical language, slang, work habits and methods used in your facility

Step 5: Make It win-win. . . Now that the vendor has a good idea of what is needed, make sure that he/she gets all of the information or assistance that needed to succeed. Don't withhold information for an "ego win" now that may hurt you later. Some of the things to consider:

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- Plant utilities that will be needed, in what quantities and from what sources
- Piping and conduit/wiring runs
- Current drawings to help ensure that the equipment is built to fit
- Details of interlocks with existing production equipment and control/data acquisition systems
- Means of getting the equipment into the facility and into place
- Any other information that will help make sure that when things arrive at your facility, they fit right the first time

A strong project leader will pull all of this together, and a strong project team will guarantee that nothing major is missed. Remember, you need to help them in order to help yourself.

Step 6: Make it work. . .

Well, after all of this work up front, it's time to dig deep and summon your boundless reserves of maintenance energy for the final push. Discuss the Five Ws again with the project leader and installation teams. Are you using the vendor, contractors and in-house people? How can you support the installation and commissioning? This is a great time to make sure things are done the way you want them, and also a golden opportunity for your maintainers to get their hands in right from the start. What a bonus for future troubleshooting! Not that you'll have many problems since you've followed these seven steps all the way along.

Step 7: Use the right Eyes. . .

Again, this is not so much a distinct step as it is a way of doing everything. Let's take cross-functional involvement a step further, and not just get employees from the plant floor in as seat warmers. Involve mechanics who can picture how they need to crawl under a machine to access a part, or operators whose average age and eyesight may dictate the design of the new touch screens. Definitely get them involved in checkouts and acceptance tests when you go out to the vendor's facility to "kick the tires" prior to delivery. Experience shows that they tend to be more critical than the project leader may be in ensuring that the agreed-upon build standards are met.

(A note on managing people's expectations: If your organization doesn't typically involve hourly workers in projects, be careful about involving them late in the process, when the major decisions are already made and the scope is frozen. If people see that their involvement is superficial or symbolic, then the effort that they give and the support that you get will drop accordingly. Early and sincere involvement is the key!)

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Success

While there is so much more to executing successful projects, hopefully the seven steps of UPP-TIME will keep some of the key principles front and center during your next large equipment purchase. If there is any one overarching principle, it is to maintain focus on the set of capabilities that you require. Don't let all of the details surrounding the new shiny equipment distract you or your project team from the fact that you are really buying an outcome for the business. This drives the equipment specifications first and foremost, and should guide all of the team's decisions. You can take control and avoid the pitfalls that may have haunted past purchases. Good luck, and remember to think win-win! **MT**

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