

RISK ASSESSMENT ESTIMATING

By George Hague



By evaluating your estimate for potential problems ahead of time and developing strategies to address them, you will improve your chances of having a successful project.

You have completed your take-off, entered the job quotes, applied profit, overhead and taxes to your estimate and you believe you have accounted for everything. What could possibly go wrong? Plenty! The question is this...where will the project go awry, and what can you do as the estimator to reduce the possibility of the project coming in with a negative profit? Risk Assessment Estimating is the best weapon you have against project catastrophes, and that assessment begins with these simple steps:

- ⇒ Analyze the project
- ⇒ Determine if it's advisable to undertake the project
- ⇒ Identify your risks
- ⇒ Quantify your risks
- ⇒ Monitor your risks

Analysis of the Project

First, study of the plans and specifications of the project as a whole. This gives the estimator a good idea of the project, so a decision can be made as to whether or not the project fits in the current matrix of the company. You should also take into account the following factors:

- ⇒ Duration of the project
- ⇒ Number of Electricians required
- ⇒ Potential Hazards
 - Weather Conditions
 - Potential delays caused by failure of other trades
 - Procurement failures. (Materials supplied by others. Example, Owner furnished lighting package)
- ⇒ Amount of engineering and drafting required
- ⇒ Quantity of construction equipment and tools required.
- ⇒ Materials procurement cost
- ⇒ Labor cost

Determine if it is advisable to undertake the project

As you evaluate the project, it is possible to forget the most important question...should you take on this project? Answering that question requires addressing other issues first, such as:

- ⇒ Will the work disrupt or interfere with other operations?
- ⇒ Is the present organization trained and equipped for the undertaking?
- ⇒ Are there sufficiently trained electricians readily available?
- ⇒ Is the present stock of tools and equipment adequate for the type of installation?
- ⇒ Are there other electrical contractors available who can more expeditiously handle the work?

Once you have decided to proceed with the estimate, you need to identify your risk potential.

Identify Your Risks

A systematized method of establishing quantities and costs will reveal many important risk areas. All of your risks may not be readily apparent when first analyzing the project, so it is worth your time to review job cost records for similar type projects. Familiarize yourself with the problems that plagued earlier projects. For example, if you're planning to outsource some part of the project or use a specific supplier, talk to project managers who have used these resources. It is also a good practice for estimators to attend project management meetings and make notes of field problems. Develop estimating procedures to help avoid these problems in future projects.

There are numerous ways to identify risks. Review the tasks and study the history of similar projects. Brainstorm and talk with your estimating team. Consult with project managers within your company that have run like-type projects and identify any of the problems they may have encountered. Most of all review the schedule.

In your review, look for areas that could cause problems. Identify tasks with which your company has no expertise. It is likely you'll underestimate the duration and cost estimates for these tasks. Ask yourself how consistent and aggressive your estimates been in the past. Note situations where you have a limited number of resources for a particular task. Take special note of tasks with several predecessors. The more dependencies a task has, the greater the likelihood of a delay. Don't overlook tasks with long durations or a lot of resources. The larger the task, the more likely the estimate will be inaccurate.

Quantify your Risks

It is important to quantify your risks so you will know how a delay or cost overrun will affect your bottom line. Start by determining your tolerance level, and then assign a probability, a cost and a priority to each risk.

Determine your Tolerance Levels. If you're a small company, any additional project costs or delays may put your entire company in jeopardy. If you're a large company, some overruns and delays may be acceptable. But no matter what size company you have, make sure you write down some hard numbers. How much cost and delay is acceptable? Remember, this isn't your preference, it's the bottom-line number your company can tolerate. A smaller company may be able to accept a tolerance equal to profit, where a larger company may accept profit plus several thousand dollars.

Assign a probability to each task and determine how like that probability is. Historical Job cost data can establish the likelihood of your company's problem areas. There are programs that are designed to compare bidding history against your current estimate. The use of one of these programs will also help isolate potential problem areas in the estimate. Set the probability limit by task. For example, if the company historically incurs losses in 40% of a suspect task, you might want to flag that task as a risk. Your company should set the bar as to when the risk should be applied to a task.

Assign a Cost: The cost of a risk can be measured in dollars, lost time, lost quality, or all three. Try to quantify the cost of a risk. The major risk most contractors face is labor. As you know, overruns on projects are covered by profit. To establish this risk in dollars and cents, divide the sum-total of the projected profit in dollars for those task(s) at risk, by the sum-total of the labor dollars for those same task(s) at risk. Subtract that results from one. Multiply the results by the sum-total of the labor dollar costs of these task(s). This can be expressed with the following formula:

$$\text{Risk Dollars} = \left(1 - \left(\frac{\text{Total Profit \$}}{\text{Total Labor \$}}\right)\right) \times \text{Total Labor \$}$$

If your costs by task are unknown or you're estimating smaller projects, use the above process on the jobs total profit dollars and labor dollars. Compare this amount with the tolerance dollars you wrote down. If your risk dollars are more than the tolerance, you will then need to adjust your bottom line or make a decision to not pursue this project. The basic concept is this...the more profit you have, the less likely the risk will reach the tolerance level.

Let's put the formula to use. We are estimating a project with the following tasks; fixtures, branch, feeders, site lighting, fire alarm system, and security system. Our tolerance dollars have been established at five thousand dollars. Job cost records document that both the fire alarm and security systems have historically had losses in over 40% of recent projects. The estimated profit on the fire alarm system is \$3,400.00 and the security system is \$2,800.00 for a total estimated profit of \$6,200.00. The labor is \$9,200.00 and \$7,400.00 respectively, for a total estimated labor of \$16,600.00.

$$\text{Risk Dollars} = \left(1 - \left(\frac{6,200.00}{16,600.00}\right)\right) \times 16,600.00 = \$10,399.90$$

Risk Assessment has indicated that we are exceeding our tolerance level. Our choices are to 1) increase the bid by ten thousand dollars, or 2) not submit a bid for this project.

Assign a priority: Assign a priority to the risk based on your company's tolerance level, the potential cost of the risk, and the probability of the risk occurring. This will prioritize your list. If you are awarded the project, make sure you pass this list on to the project manager. Once you have identified and quantified risks, you need to plan for them.

Monitor Your Risks

Now that you have a watch-list, both the estimator and project manager will need to monitor it.

As the project progresses, review the job cost records, and make note of problems at project management meetings. Develop estimating procedures to help limit the potential of risks.

With a little preplanning, forethought and communication you can significantly decrease the risk to your future projects through Risk Assessment Estimating.

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