



The Four Critical Job Status Indicators Every CFO Should Know

by Richard L. Werner

“How can I determine if a job is progressing satisfactorily without wading through reams of paper?”

Keeping tabs on how jobs are progressing is crucial to your company’s profitability. Luckily, the data you need to readily monitor job progress is probably already available to you.

Assuming best practices are followed, there are four indicators that, when taken together, can reliably determine how a job is doing by integrating all of the financial variables which reveal and predict a job’s performance. While these indicators do not tell *why* a job is doing better or worse than planned, they will alert you to jobs that are crying out for tighter management and more attention.

Defining Common Ground

Before examining these indicators, it’s important to establish consistent definitions for these four common terms:

- Original Budget
- Forecast
- Revised Budget
- Estimated Cost at Completion

Although familiar to us all, these terms are often inconsistently (even improperly) defined. However, incorporating their proper meanings into your management information system is *so important to your success in determining job performance* that a good portion of this article is devoted to developing these definitions.

Original Budget (OB): This is the cost budget associated with a job at the time the job is awarded, or as modified by the job’s project manager prior to job inception. The OB must be compatible in form and function with the way incurred costs are to be recorded. Once established, the OB is not changed for any reason. It is broken down in accordance with the job’s work breakdown structure.

Revised Budget (RB) = OB + Scope Changes: The RB reflects the OB *plus* the cost budget associated with customer-requested scope changes. This is the most important budget pertaining to a particular job because it is the reference point,

or baseline, to which the estimated cost at completion (ECAC) is compared from job inception to completion.

How important is the RB? Well, suppose you asked a friend for the score of a basketball game and that person told you the score of one team without telling you the score of the other. You wouldn’t have enough information to know what happened. This is comparable to running a job without an RB; you don’t know if you are winning or losing. For this reason, great care has to be taken when defining the RB.

The scope changes referred to in this article are changes in work for which the contractor will be paid. For our purposes here, scope changes and change orders are equivalent. In the real world, however, scope changes are frequently considered transactions between customers and contractors, while change orders are often considered transactions between a contractor or subcontractor, and a subcontractor.

There are several common situations that should not affect the RB:

- savings or overruns due to subcontractor or vendor buyouts;
- costs due to unexpected weather conditions or for any other occurrence, when such occurrences are not to be paid for by the customer; and
- forced work orders, unless payment for the work is likely.

One situation, however, that does affect the RB is a rearrangement of work (ROW), a redistribution of resources in order to accomplish the original scope of work using a different methodology. To ensure that ROW transactions do not impact a job’s revised budgeted margins, the sum of the rearrangements equals \$0 at the job (top) level, regardless of the changes made further down in the work breakdown structure. A contingency cost code is frequently used in conjunction with ROW transactions to ensure that they net to \$0.

When and How to Adjust the RB

I often find there is some confusion about *when* in the scope change process the RB should be amended. However, by examining the steps in the scope change process, it is very clear when the update should occur.

- 1) The customer requests a proposal for a scope change, which the contractor prepares and submits to the customer.

At this point, the RB is not affected; however, the proposal is tracked so the contractor can identify the value, number, and content of outstanding proposals for any given job at any given time.

- 2) The customer either rejects the proposal or accepts it, perhaps even with modifications, and the contractor receives a "Notice to Proceed."

At this point the customer has not formally signed the scope change (in reality, the signed scope change may not follow for weeks or even months), but the contractor starts work anyway, thinking, "I don't have a signed scope change, so I'm not going to update the RB, even though I am proceeding with the work and incurring the associated costs."

This is very dangerous. The job will always appear to be overbudget because the RB is too low. The RB should be updated at the time the Notice to Proceed is received. At the same time, your system should track *unsigned* scope changes that are impacting the RB, so you can effectively monitor and manage those items.

If the arrival of the Notice to Proceed alerts contractors to update the RB, it also frequently prompts contractors to ask,

"How do I best record the change in contract amount associated with the Notice to Proceed transaction?" There are three commonly used methods.

- 1) Don't record the contract amount change at all until the scope change is signed.
- 2) Record the contract amount change without any margin until the scope change is signed.
- 3) Record the fully margined contract amount associated with the scope change when the Notice to Proceed is received.

When using the four powerful indicators that are the subject of this article, it is important to properly record the *fully margined* scope change and to keep the RB properly updated. The best way to do this is have three Contract Amount categories: Original Contract Amount (OCA), Revised Contract Amount (RCA), and Forecast Contract Amount (FCA).

The OCA corresponds to the OB. The RCA comprises the OCA plus additional contract amounts associated with all *approved (signed)* scope changes. The FCA comprises the RCA plus all *unsigned* scope changes/contract modifications with authorized Notices to Proceed. The difference between the FCA and the RCA (i.e., unsigned scope changes for which there is a Notice to Proceed) should be continually managed so it will be reduced to \$0 before the job is completed. For revenue recognition purposes, the FCA should be used (with proper contingency offsets, if necessary).

These relationships are clearly delineated in Figure 1 below, which lists typical events associated with the normal construction process, and shows whether the event impacts the OB, RB, forecasted costs, OCA, RCA, and/or FCA.

Figure 1: Event Types that Impact Job Budgets and Contract Amounts

Sequence of Events	Impacts					
	Costs			Contract Amounts		
Event Type	Original Budget	Revised Budget	Forecast Cost	Original Contract	Revised Contract	Forecast Contract
Award (AWAR)	Yes	Yes	Yes	Yes	Yes	Yes
Budget Rearrangement ¹ (BUDG)	No	Yes	Yes	N/A	N/A	N/A
Proposed Scope Change (PROP)	No	No	No	No	No	No
Notice to Proceed (NOTI)	No	Yes	No ²	No	No	Yes
Approved Scope Change (APPR)	No	Yes	No ²	No	Yes	Yes

¹ Budget rearrangements affect the Revised Budget for individual cost codes, but net to \$0 for a job and have no impact on the contract amount.

² If forecasting is performed, this value should be "No" since the forecast updates the Forecast Cost. If forecasting is not performed, this value should be "Yes."

Forecasts: Forecasts are a project manager's best projection of hours, quantities, and costs at job completion, down to the finest level of the work breakdown structure. (Forecasts are normally furnished on a monthly basis.) In determining these forecasts, project managers integrate all available job information, as well as all scope changes for which a "Notice to Proceed" was received. Forecasts, when used, are typically the single most important piece of information entered into a contractor's management information system.

While it is not necessary to implement forecasting to use the indicators described in this article, effective forecasts make the indicators much more meaningful. For small jobs, or for jobs run by inexperienced project managers, it is often wise not to forecast and/or to lessen the impact that the forecast has on the estimated cost at completion, which is discussed next.

Estimated Cost at Completion (ECAC) = (Management Information System Data + Forecast Information): The ECAC is a function of integrating budget and forecast information, as well as information contained in your information system, such as committed costs, incurred costs, and productivity. While it means nothing by itself, the ECAC is the basis for two of the four indicators – projected cost variance and over/underbillings.

The Four Indicators

Now that we have established our common financial terminology, we can address the four key indicators. A word of caution, though, before we proceed: In order for indicators 1, 2, and 4 to be meaningful, these definitions must be rigorously applied. If not, these three indicators will give misleading information, which is worse than no information at all.

Indicator 1: Projected Cost Variance (PCV)

$$PCV = ECAC - RB$$

The PCV is the single most important indicator of job progress. On Day 1 of a job, this indicator usually, but not necessarily, is \$0. As a job progresses, this indicator becomes either positive (adverse, over budget) or negative (favorable, under budget). In one number, the PCV captures everything about how a job is progressing *operationally* (as opposed to financially), and easily indicates operational problems from the job level all the way down the work breakdown structure.

This one indicator shows how the job costs will vary from the RB at job completion if action is not taken. The earlier in the job cycle that adverse variances are determined, the better the chances that appropriate action can remedy the situation. The PCV is normally calculated monthly and is formulated as of the end of the job, not as of the date that the calculation is made. Projecting to the end of the job is preferable because many costs not related to productivity (e.g., committed costs and material costs) are much easier to evaluate as they relate to the total job at completion, rather than to fractional points in the job cycle.

When I ask CFOs how they measure job progress operationally, they frequently point to such indicators as percent complete, revenue, billings, margin, or cash flow as their most critical indicators. *The PCV, however, is a*

more powerful indicator because it encapsulates the variance from plan in one number.

Finally, note that the only judgment-critical variable associated with this indicator is the ECAC. The rest is routine process and bookkeeping.

Indicator 2: Over/Underbillings (O/UB)

$$O/UB = \text{Revenue} - \text{Billings}$$

Unlike other industries, overbillings and underbillings are common in the construction industry. Contractors can capitalize on this to improve liquidity and to compensate for customer-withheld retention. It is common for lump-sum and unit-price work to "front-end load" billing schedules, so the billing-to-costs ratio is larger for work performed at the beginning of the job than for work performed later in the job cycle. In a practice called "unbalancing" (common in unit-price work), items with the potential for quantity overruns are priced with higher margins than items with little or no chance of overruns (or possible elimination from the contract).

These practices should result in a normally overbilled position for a job, with overbillings typically largest in the early to mid-portion of the job cycle. (For a comprehensive discussion of over/underbillings, see "Billings Analysis By Computer: The Ultimate Tool For Financial Managers," *CFMA Building Profits*, September/October 1995.)

Considering these factors, *underbillings in a job should be a major warning to financial managers.* Underbillings can and usually do occur where many (or even all) other financial indicators, including PCV, are favorable. As such, underbillings can be a telltale sign that everything is not "copacetic." Underbillings usually occur because the operations staff has either: a) not updated the forecasts or b) forecasted too low, resulting in an ECAC that is skewed too low and a percent complete that is skewed too high.

Since the percent complete is too high, the billings resulting from that figure are also too high. The customer cannot be billed by those numbers, which leads to underbillings. In reality, the amount billed is probably consistent with the work that has been done, but the ECAC is not correct. An incorrect ECAC is a more serious problem than underbilling *per se*; the corrected ECAC will reduce the job's revenue and associated gross margin, etc. Due to these factors, underbillings are frequently a sign of serious problems. Once the underbilling situation is identified, and the ECAC corrected, you will often find that the job is actually overbilled!

The O/UB indicator can sometimes be more important than Indicator 1. In addition to possibly indicating an incorrect ECAC, O/UB relates to non-quantifiable factors, such as an unhappy customer, work falling behind schedule, or work of poor quality that must be redone, as well as just the normal lassitude project managers exhibit in connection with submitting requisitions for payment. So, job underbillings should be investigated even if all other job metrics are favorable.

Indicator 3: Cash Flow (CF)

CF is the ultimate reality check. We've all seen jobs where Indicators 1 and 2 were favorable, but the job was still a bust

Figure 2: Sample Screen

Job Number	Job Name	Project Manager	Cost Variance	Over/Under Budget	Cost Flow	Contract Amount	OGNs	RDns	EMC%	EPCT	Contract Status
0000	PCOYTE INC	AL DIEDRICH	44,343	12,969	-1,041,267	2,092,370	4.0	7.5	5.4	9.7	134,031
0001	OLYMPIC PARK	AL DIEDRICH	42,811	-1,207,000	-1,888,419	15,777,240	9.0	9.9	9.8	80.0	7,418,742
0002	DOORMOUTH RUTH.	LARRY FUGGER	37,730	141,819	-189,819	1,222,090	8.0	3.0	7.8	79.7	219,877
0003	ALBANY RD	DANE FOOT	29,876	87,808	-44,143	1,493,472	3.1	17.2	11.2	87.8	483,881
0004	WYOMING AMERICAN	LARRY FUGGER	24,817	-12,278	-8,892	1,130,000	42.0	42.8	22.0	85.0	88,574
0005	THUNDER LAKE	DEBBIE HOUDEW	16,815	-10,758	-14,878	7,438,511	25.4	26.4	24.2	1.4	1,419,191
0006	OCEANVIEW	DANE PLUSH	-1,868	31,741	-30,878	189,800	8.0	8.8	9.8	87.8	53,381
0007	ATLANTA HOSPITAL	DANE FOOT	-2,598	1,518	-132,155	389,890	8.0	6.4	10.2	89.5	1,511
0008	WILL LANE	DOUG RUDD	-27,318	-240,878	-172,818	1,887,488	1.9	2.4	3.8	89.4	818,421
0009	HARBORVIEW	DEBBIE HOUDEW	-76,808	489,814	-1,215,741	8,256,289	8.0	11.5	12.8	89.2	1,890,118
TOTAL			80,178	-887,262	-6,878,992	28,078,284					12,238,521

Using the Four Indicators

To ultimately produce reliable financial statements, you need a system that easily identifies the four indicators described here. Then, once an aberrant indicator is found, you can dig down into the job to determine why the aberration occurred and how best to fix it.

An example of a screen from such a system is shown above. To be useful, the system should enable you to look at the indicators for all jobs within your company, slice and dice them in any way you like and, then,

strictly because the customer can't (or won't) pay the bills. Indicators 1 and 2 are based upon internal factors. Indicator 3, CF, is a measure of customer/client/supplier relationships. As such, it should be carefully and frequently monitored.

Indicator 4: Scope Change Effectiveness Index (SCEI)

$$SCEI = \frac{(FCA - RB)/FCA}{(OCA - OB)/OCA}$$

SCEI is a percentage ratio of revised contract budgeted margin to original contract budgeted margin. It indicates that both the contract amount and contract cost portion of the scope changes are properly processed. Unless special arrangements are made with the customer regarding scope change margin percentages (after the job has been awarded), this indicator is normally greater than 1. If the SCEI is less than 1, the scope changes are probably not being recorded correctly in the management information system.

This indicator has nothing to do with job production, variances, or relationships with the customer. It simply determines if the scope changes are being entered properly into the system. The purpose of this indicator is to prevent inadvertent omission of the revenue portion of a scope change when the cost portion is processed. This is a frequent problem in the construction industry, resulting in what is commonly referred to as *scope creep*.

based on your observations or predetermined parameters, set certain actions into motion that will prevent small problems from turning into big ones. In the final analysis, isn't that what it's all about? **BP**

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