

EVMS Training Snippet Library: FFP Subcontracting and Prime EVM



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Achieving Management and Operational Excellence

This EVMS Training Snippet sponsored by the Office of Acquisition and Project Management (OAPM) covers Firm Fixed Price (or FFP type) subcontracts.

FFP Subcontractor Effort in the Prime's EVMS and Data



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- **Is the FFP work integrated into Prime's EVMS**
 - Schedules
 - PMB
 - Invoices / Payments
- **Does the CPR / IPMR include**
 - FFP payments without booking lag
 - FFP subcontractor schedule variance

To begin, how does the Prime integrate the subcontractor's scheduled work into the project's schedules? What approach is the Prime using for the subcontracted effort and associated budget in the Prime's PMB? How is the Prime accruing subcontractor invoices into its accounting process group for payments to the FFP subcontractor?

Then, there is the performance report the Prime must submit using either the CPR or IPMR. How does the Prime intend to accrue subcontractor invoices for payments to the subcontractor, which should be consistent with the earned value claimed, to avoid booking lag with the ACWP? Or, will the Prime Contractor use Estimated ACWP? Also, how will the Prime integrate and address any schedule variance that the FFP subcontractor might have?

Let's pursue the process further to address these concerns.

Organizing Subcontracted Effort



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- **Work Breakdown Structure**
- **Prime/subcontractor WBS integration**
- **Organization breakdown structure**
- **Authorizing identified work**

The first step in incorporating the subcontracted effort is the integration of the subcontractor's contract work in the Prime's Work Breakdown Structure. This step would be performed for any type of subcontracted effort. The subcontracted work should also be assigned to the responsible control account manager in the Prime's Organizational Breakdown Structure.

Once the subcontractor's efforts have been identified within the Prime's WBS and OBS, the Prime's work authorization subsystem becomes active' and work authorization documents are issued.

Firm Fixed Price Planning



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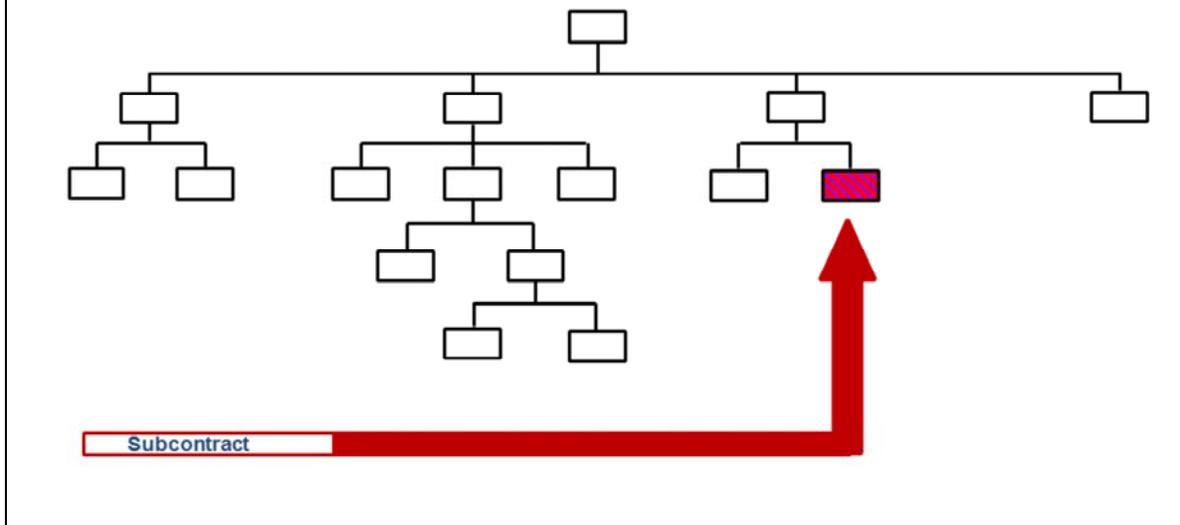
- **With progress payments**
 - Expenditure/Billing plan, if realistic for accomplishment
 - Milestones identified in contractual schedules
- **Without progress payments**
 - Dollarized milestones tied to deliveries

Different options exist for the Prime when planning firm fixed price subcontracts. When planning FFP subcontracts with progress payments, the Prime may use an expenditure/billing plan for BCWS time-phasing and milestones directly tied to the subcontractor's project master schedule. However, there is a concern with using the expenditure/billing plan. To improve cash flow, the subcontractor may desire to front load the plan to accelerate the amount of the initial payments. The BCWS plan needs to be consistent with the schedule. Therefore, if the billing plan is not consistent with the time phased schedule, the prime may need to ask the subcontractor for a time phased budget plan or resource profile.

A better approach is when the subcontractor prices the milestones in its master schedule with the expenditure/billing plan. For subcontracts without progress payments, BCWS is based on dollarized milestones tied to deliveries.



Subcontract effort in single WBS element

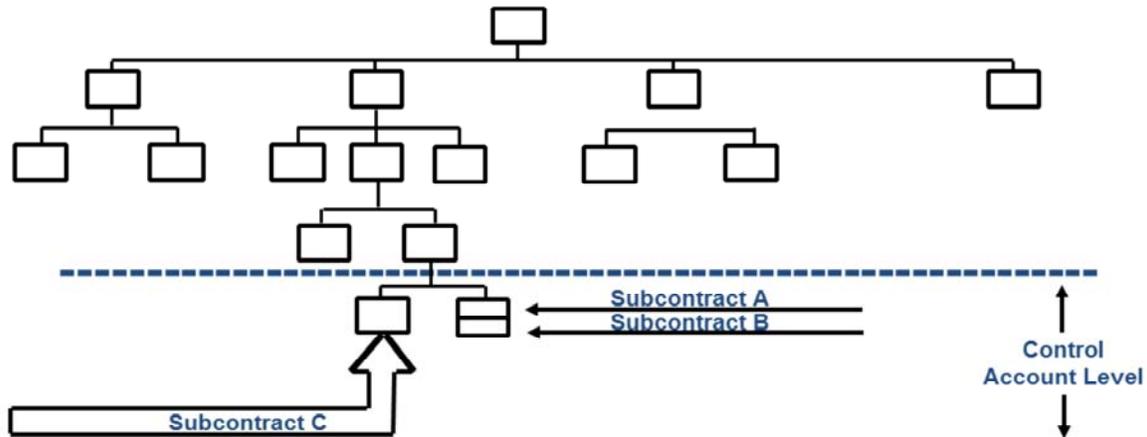


The Prime basically has two options for integrating the FFP subcontractor's efforts into its WBS. This is an example of a single WBS element with a single subcontract. This is a very logical approach for the Prime to take if the procurement is an end item, or a single system that is going to become part of the Prime's equipment. Remember that the WBS is product oriented. This type structure is only appropriate if the subcontractor is only involved in one product. The method of integration needs to be consistent with the work breakdown structure.

Subcontract Control Account Establishment



Subcontract as single Control Account or one of several work packages within a Control Account



In the single approach, one subcontract is planned as one control account. The subcontract can be planned as one work package within a control account that contains other work packages, but that requires the Prime's accounting system to be able to collect actual costs at the work package level. If the subcontract is the WBS element itself, there is only one control account for that WBS.

Subcontract as One of Several WPs Within a Control Account



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- **Variance Analysis may be cumbersome depending on data accumulation subsystem**
- **Internal performance measurement system must be capable of accumulating actual costs at work package level or lower**

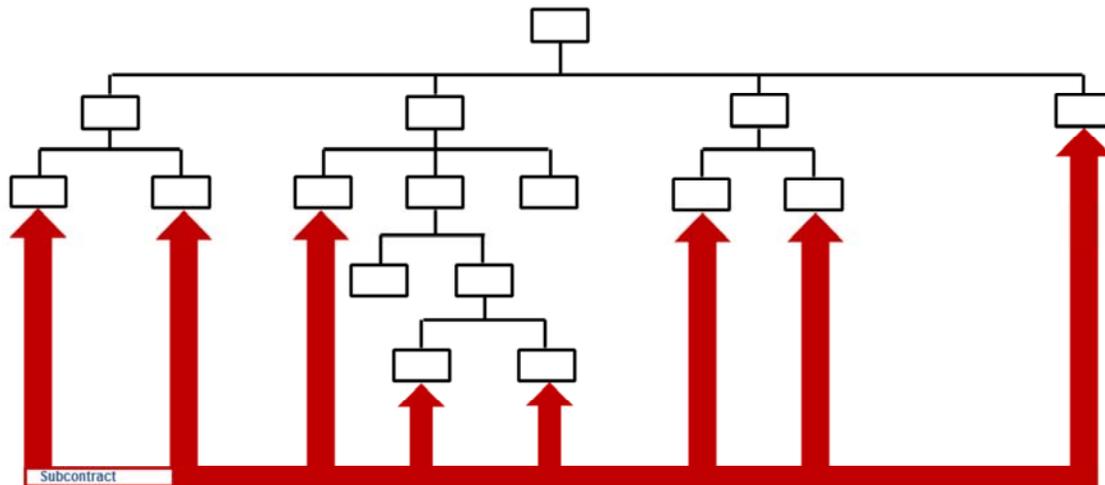
When a subcontract is one of several work packages within a control account, variance analysis can become a challenge. If a key element of performance data, actual costs, can be collected only at the total control account level, the performance of one subcontract will tend to mask the performance of the other subcontracts. At the total control account, it may be difficult to perform problem analysis when the actual costs and problems are comingled between multiple subcontracts.

This is just one of the problems facing a contractor whose accounting system is limited to collecting costs, the ACWP, only at the control account level.

Prime Contract/Subcontract Integration



Subcontract effort allocated to multiple WBS elements (Least desirable)



Another option for the Prime is to allocate the FFP subcontractor's efforts across multiple WBS elements as illustrated here. The question then is how to measure a single procurement spread among a number of control accounts? It might be easier to treat them as individual procurements, considering the Prime will need performance measurement information for each element.

If an FFP contract does not stipulate this type of breakdown in the subcontractor's contract, the Prime will need to undertake WBS architecture beforehand when using this approach.

Subcontractor's Schedule



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- **Should be in a format that allows ready integration into prime's internal scheduling system**
 - For example WBS => WBS
- **Should be directly relatable to Prime's Control Account structure**

The subcontractor's schedule should be easily integrated into the Prime's scheduling system. One approach is the sub's schedule is organized by Work Breakdown Structure; or by the Prime's control account structure, which is a lower level of the Prime's WBS.

Baseline Establishment Phases for the Subcontract



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- **Initial baseline establishment prior to negotiations**
- **Definitized baseline establishment after subcontract negotiations**

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Generally, the initial baseline establishment of the subcontracted work into the Prime's PMB is done prior to negotiation completion. Consequently, PMB adjustments because of post negotiations may be necessary.

Post Negotiations Adjustments



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- **If negotiated subcontractor firm fixed price is more than Prime's subcontract control account BAC**
 - Management Reserve
 - Only if the subcontract has NOT incurred actual charges against the negotiated effort
 - Applies only to original negotiation differences; MR will not be used for future scope changes
 - Factoring

If the subcontracted work has not yet started and the negotiated price of the subcontract exceeds that which has already been authorized by the Prime to its CAM or CAMs, the Prime has two budget adjustment options. The first is to use Management Reserve to increase the control account's or accounts' Budget at Completion to reflect final negotiations. Another choice is to use factoring of the BAC, BCWS, and BCWP for each of the control accounts involved. Ultimately the final decision will depend on whether the subcontractor's effort has started.



$$\frac{\text{Prime's BAC}}{\text{Subcontractor's BAC}} = \frac{\$190\text{M}}{\$200\text{M}} = .95$$

- Factor is applied to **Budget** and **Earned Value**
- **Actuals** and **EAC** are not factored
- The factoring may be determined at the total contract level or it may be done for specific WBS/ CLINS/ Control Accounts, as appropriate

Factoring the subcontractor's BCWS, BCWP and BAC values when the negotiated subcontract price does not equal the prime's Control Account BCWS and BAC can happen because the formal bid for in-house work is now being subcontracted out. The subcontract price may end up being more. This can also happen when the Control Account for the planned subcontractor estimate differs from the final negotiated amount.

The Subcontractor's EAC amount is not factored and in fact should be the same as the BAC when using a FFP subcontract, but the difference in the prime and subcontractor amounts should be accounted for in the Estimate at Completion (in the example, \$10M). This means the EAC will represent the subcontract price barring any other estimate adjustments. When the negotiated value of a subcontract is greater than the CAM's budget and factoring is used, the subcontractor's BAC will be the CAM's EAC. For example, if the subcontractor's BAC was \$200M and the CAM's budget for the work was \$190M, the CAM's EAC would be the subcontractor's BAC of \$200M.

Of course, actuals are actuals and like the EAC, they are also not factored.

While Management Reserve (MR) may be used, and it helps avoid the need to factor, it may not always be the best practice since it may not recognize poor estimating practices and thus requires corrective action to prevent continued recurrence, cannot be applied after the work has started, limits MR availability for future risk events, and may not be possible if all MR has been use for other purposes. For these reasons, factoring is a recommended optional practice to consider.

Factoring Objectives



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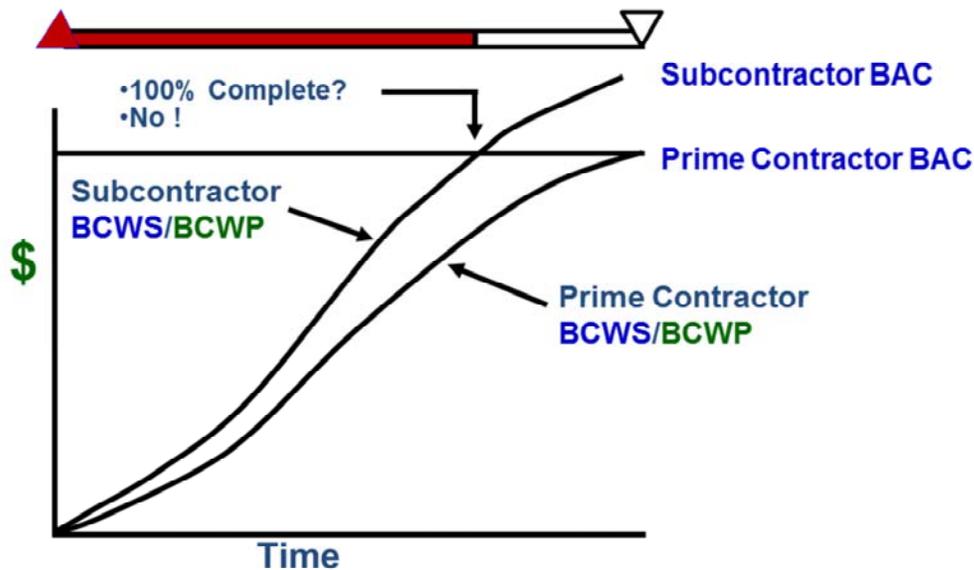
- To ensure subcontract factored **BCWS** equals prime contractor's **available budget**
- To ensure prime contractor's factored **BCWP** is consistent with the subcontract factored **BCWS**
- To ensure prime contractor percent complete equals subcontractor percent complete

Factoring is accomplished to reduce the subcontract value as it exists in the prime's budget such that it does not force the prime to go into an Over Target Baseline (OTB). This is not "misleading" to the customer as long as the real subcontract value is reflected in the prime's EAC.

If an EVM requirement does not exist on the FFP subcontractor, the prime is responsible for statusing the work. The prime's CAM statuses the work based on verified progress against the prime's schedule and BAC, and therefore factoring is not required.

Obviously, an incorrect schedule variance caused by a lack of factoring earned value will result in an incorrect % complete based on inconsistent data between the prime and the subcontractor. Proper factoring will ensure consistency.

Factoring Objectives



NOTE: Actuals AND EAC are not factored.

This shows what will happen if the prime contractor does not factor BCWS and BCWP using the same factoring scheme. As shown, the prime contractor will have the subcontractor at 100% complete when in it may only be 90% complete.

If the subcontractor's data (both BCWS and BCWP) are not factored to adequately reflect the budgets in the prime contractor's system, then BCWP and percent complete will be overstated.

Again, we emphasize that actuals and EACs are not factored.

CAM Responsibilities



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- **Review subcontractor's schedules, reports and milestone payments**
- **Attend subcontractor project status reviews**



The responsibility rests on the CAM or CAMs responsible for the FFP subcontractor's earned value, or BCWP, as work proceeds on the contract. This can be accomplished in the same manner as with any subcontracted effort. The CAM reviews updated schedules, reports, or payment requests that are tied to milestones. The CAM should also attend the various on-site project reviews held by the subcontractor to verify performance.

Determining Earned Value for Firm Fixed Price Subcontracts



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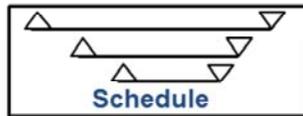
- **Earned Value Techniques**
 - Interim Milestones
 - 50/50
 - 0/100
- **ACWP = BCWP and must be accrued together by the subcontractor**

The typical earned value techniques that the Prime's control account manager can use to determine subcontractor performance are variations of the milestone approach: Interim, 50/50, and 0/100. Since these techniques are generally related to progress payments on firm fixed price type work, there is never a cost variance; the ACWP will always equal the BCWP value from the subcontractor; subject to the prime's factoring of the BCWP.

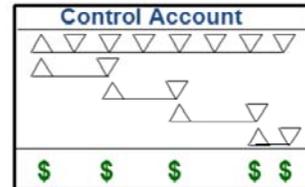
FFP Subcontracts and Actual Cost of Work Performed



With Progress Payments



Without Progress Payments



This illustrates two approaches for the Prime's inclusion of ACWP for the subcontracted effort -- with and without progress payments. Whichever approach the Prime takes for BCWP and ACWP on firm fixed price work, the Prime must avoid booking lag in its accounting system by accruing BCWP and ACWP together.

Booking lag on a firm fixed price effort suggests an underrun has occurred; because BCWP has been entered into the system, but ACWP has lagged. This implies a nonsensical underrun on a firm fixed price contract. The solution to this is to use estimated ACWP. This is accomplished by manually entering the applicable ACWP to coincide with the BCWP. When payment is made and recorded in the accounting system, adjustments to the estimated ACWP, if necessary, will be made.

Potential FFP Contract Changes and the Prime's EVM System



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- **Subcontract changes or approved Requests for Equitable Adjustment (REA)**
 - Prime requests effort done differently
 - Prime requests new scope
- **Prime updates control account WADs and CAPs**
- **Prime provides budget for new scope or scope changes to the subcontractor either via**
 - MR if available and if an internal change
 - UB if scope change was the result of a contract modification to the prime

Occasionally the Prime will request that the firm fixed price subcontractor undertake the contracted work differently than originally scheduled, or will request new scope of work. Both of these events could result in a Request for Equitable Adjustment, or REA, by the subcontractor. After an adjustment amount has been negotiated, the Prime will record the change in the applicable project log, either MR or UB, and then allocate the budget and update the applicable control account's work authorization document, schedule and control account plan.

Subcontractor EAC – Special Topic



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- **Although FFP – Schedule Performance and REAs can cause significant concern**
- **The prime contractor's CAM must status the schedule consistent with the work completed**
- **The prime contractor must have a method of updating the prime EAC for the subcontractor**

FFP subcontracts may create unique challenges for the Prime's CAM. The billing plan, if applicable, is not used to create or status the Integrated Master Schedule (IMS). The IMS is built to depict the way the work will be performed and produce a meaningful critical path. For a construction FFP subcontractor, the IMS is statused based on the accomplishment of the construction. If the construction is behind schedule, BCWP should reflect that and be reported as such in the prime's EVM subsystem.

This creates unique challenges with ACWP. To avoid a false cost variance requires the use of estimated actuals for the difference with the payment plan.

The EAC is a significant concern. The EAC must consider schedule performance and potential REAs that may or could exist. The prime contractor's EVMS processes need to identify appropriate methods of forecasting subcontractor cost growth.

Summary



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- **Prime's EVM System must have FFP subcontract schedule, budget, performance, and ACWP integration**
- **Prime's CPR/IPMR includes FFP subcontract EV data and applicable SV analysis**
- **FFP changes are incorporated in Prime's Change Control subsystem**

In summary, it is the Prime contractor's responsibility - and requirement - in an Earned Value Management System environment to integrate the firm fixed price subcontractor's schedule and budgeted work using applicable EVM flow down requirements that will most accurately assess work performed. Thereafter, each month the Prime's CPR or IPMR includes the subcontractor's earned value data and any applicable schedule variance analysis.

Since it is a firm fixed price type contract, there should never be a cost variance or Variance at Completion unless there was an initial negotiated price difference that was reflected only in the Prime's EAC, or additional REAs that are forecast.

Any subsequent changes to a firm fixed price subcontract are accomplished by the Prime in its Change Control process and reported in the CPR or IPMR Formats 1, 2, and 3 and discussed in Format 5.

DOE OAPM EVM Home Page

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Earned Value Management (EVM) is a systematic approach to the integration and measurement of cost, schedule, and technical (scope) accomplishments on a project or task. It provides both the government and contractors the ability to examine detailed schedule information, critical program and technical milestones, and cost data.

- EVMS Surveillance Standard Operating Procedure (ESSOP) - 26 Sep 2011 (pdf)
 - EV Guideline Assessment Templates - (MS Word)
 - DOE EVMS Cross Reference Checklist - (pdf)
 - DOE EVMS Risk Assessment Matrix - (MS Word)
- Formulas and Terminology "Gold Card" - Sep 2011 (pdf)
- Slides from the OECM Road Show: Earned Value (EV) Analysis and Project Assessment & Reporting System (PARS II) - May 2012 (pdf)
- DOE EVM Guidance

EVM TUTORIALS

Module 1 - Introduction to Earned Value (pdf 446.86 kb) July 17, 2003

This module is the introduction to a series of online tutorials designed to enhance your understanding of Earned Value Management. This module's objective is to introduce you to Earned Value and outline the blueprint for the succeeding modules. This module defines Earned Value management. It looks at the differences between Traditional management and Earned Value management, examines how Earned Value management fits into a program and project environment, and defines the framework necessary for proper Earned Value management implementation.

• <http://energy.gov/management/office-management/operational-management/project-management/earned-value-management>

For information relative to EVMS procedures, templates, helpful references, and training materials, please refer to OAPM's EVM Home page. Check back periodically for updated or new information.

Thank you