

Department of Defense

Earned Value Management Contract Checklist

Kim Hunter
Professor, Earned Value Management
Business, Cost Estimating & Financial Management Defense Acquisition
University Capital and Northeast Campus 9820 Belvoir Road, Ste G3
(BCEFM) Fort Belvoir, VA 22060-5565
Phone: 703-805-3343
DSN: 655-3343
Fax: 703-805-3186
Email: kim.hunter@dau.mil

Abstract

As the Department of Defense (DoD) increases emphasis on Earned Value Management (EVM) as a project management tool, more and more program offices are finding themselves having to implement and then subsequently execute EVM on their contract. Although EVM is a project management tool, EVM responsibilities are routinely assigned to the business or financial management section which is typically staffed with financial management analysts and cost estimators who may have little or no EVM experience or training. Even if an EVM analyst is on staff, his or her experience and training can vary greatly. Recognizing the need for a convenient and comprehensive aid for implementing EVM, the Defense Acquisition University (DAU) has developed a checklist that covers the major EVM contracting requirements. This paper will discuss the decision process to determine if EVM should be implemented and if EVM is determined to be the right fit, what is then required on the contract.

Introduction

During the acquisition strategy phase of program development, one of the major decisions that must be made by the Department of Defense's (DoD) Project Management Office (PMO) and the Project Manager (PM) is whether or not the government will require the contractor(s) to use Earned Value Management (EVM) as a tool for program control. The DoD Earned Value Management Implementation Guide, (EVMIG) states:

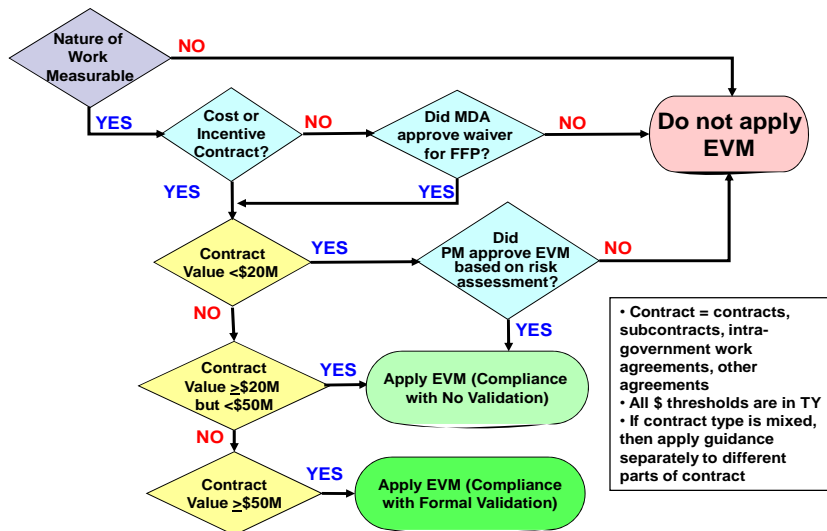
The PM and PMO have the responsibility to help ensure that all solicitations and contracts contain the correct Earned Value Management System (EVMS) and Integrated Master Schedule (IMS) requirements, tailored as appropriate for the specific nature of the program in accordance with DoD policy. The PM and PMO also have the responsibility to conduct the Integrated Baseline Review (IBR), perform integrated performance analysis, use this performance data to proactively manage the program, and accurately report performance to decision makers. (Defense Contract Management Agency,[DCMA], 2006, p. 9)

These responsibilities and tasks can appear to be overwhelming at the onset and often the decision to require the use of EVM may not be straightforward. An EVM determination flowchart has been developed to assist the PMOs with making the call. If the answer is "yes" to EVM, the Defense Acquisition University (DAU) has developed an EVM Contract Requirements Checklist to assist the government's PMO with ensuring all EVM contract considerations have been properly and timely addressed. Since EVM-related contract requirements are subject to change after the publication of this paper, a link to the most current version of the EVM Contracts Requirement Checklist can be found at: <https://acc.dau.mil/CommunityBrowser.aspx?id=144762&lang=en-US>

EVM Determination

EVM is defined as "a program management tool that integrates the work scope, schedule and cost parameters of a program in a manner providing objective performance measurement and management." (DCMA, 2006, p. 92). EVM can greatly assist a PM with effective management of a program if applied to programs where it makes sense. If EVM is not the appropriate program management tool, its application could prove to be ineffective and result in wasted effort and frustration for both the government and contractor program teams. So the decision to implement EVM should be made early as possible in the acquisition strategy. A three-step process to assist programs with determining if EVM is a good fit and should therefore be required on a contract is shown in Figure 1. This process is taught in DAU's Intermediate Earned Value Management Course, BCF -203.

Figure 1: EVM Determination Flowchart



There are three primary conditions that must be present for the meaningful application of EVM. First, the work must be measurable. Second, the contract should be a cost reimbursement or incentive type. Third, the contract’s value should exceed a specific value threshold. Generally, if a program does not meet these specific conditions, EVM would not be used. However, there are a couple of waivers and exceptions to these requirements that are at the Project Manager’s discretion if he or she strongly believes EVM is necessary based on a program’s high risk and/or high visibility.

Decision One: Is the Work Measurable?

Step One requires the government to determine if the work is measurable, can be planned and if a definitive completion of the work can be made. See Figure 2. For example, if the work is of a routine, operational nature such



Figure 2. Step One: Is the Work Measurable?

as maintenance where repair work will occur only on an “as needed” sustainment

basis, it would be next to impossible to plan for work that may or may not occur at some undetermined date in the future. According to the EVM Implementation Guide, page 12, regardless of the contract value, DoD discourages “the application of EVM to contracts that may be categorized as “non-schedule-based”, i.e., those that do not ordinarily contain work efforts

which are discrete in nature, should be considered on a case-by-case basis. “Non-schedule-based” contracts include:

- Those compensated on the basis of “time and materials” (T&M)
- “Services” contracts,
- Any contracts composed primarily of Level of Effort (LOE) activity, such as program management support contracts.
- Indefinite Delivery/Indefinite Quantity (ID/IQ) or task order type contracts, within which work is awarded on the basis of delivery orders that may or may not be schedule-based. (DCMA, 2006, p. 12)

Although models exist to predict an anticipated workload effort based on historical data; for sporadic, unpredictable and open-ended work, EVM would not be an appropriate management tool. Therefore, the government would not require the contractor to apply EVM.

If, on the other hand, the work is closer in nature to a technical refresh where an allotted amount of devices are planned to be upgraded each month the work can clearly be planned, executed, and measured then EVM should be considered. The work must also have well-defined completion criteria and cannot be open-ended. In this case, EVM would be a natural fit for effective program control and we would move to Step Two. But before deciding to require the contractor to use EVM, the government must then answer “Is the work being procured under a cost reimbursement or incentive contract?” which leads us to the next decision point – Contract Type (DAU, 2011, Lesson 2, slide 12).

Decision Two: What is the Contract Type?

According to the Federal Acquisition Regulations (FAR) Part 16, contracts are grouped into two broad categories: fixed-price and cost-reimbursement contracts. If the procurement will be made with a cost reimbursement or incentive type contract, EVM may be required, see Figure 3. The overarching consideration for both EVM application and contract type is the nature of the work.

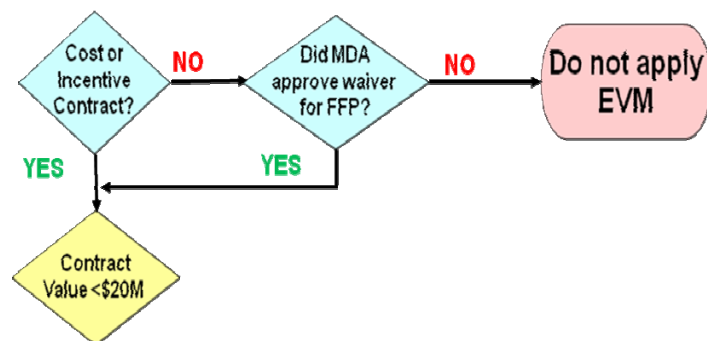


Figure 3. Step Two: What is the Contract Type?

Fixed-Price Contracts

The FAR identifies six different fixed-price contracts:

- Firm-Fixed-Price Contracts
- Fixed-Price Contracts with Economic Price Adjustment
- Fixed-Price Incentive Contracts

- Fixed-Price Contracts with Prospective Price Redetermination
- Fixed-Ceiling-Price Contracts with Retroactive Price Redetermination
- Firm-Fixed-Price, Level-of-Effort Term Contracts (Federal Acquisition Regulations, Part 16)

While the FAR readily allows the application of EVM on FFP contracts and most federal civilian government agencies follow the FAR guidance with regard to EVM application, DoD actively discourages applying EVM on Firm-Fixed Price (FFP) contracts. The application of EVM is one of the few occasions where DoD has issued more restrictive acquisition guidelines than those found in the FAR. For EVM application, DoD PMs must follow guidance as set forth in the Defense Federal Acquisition Regulations Supplement (DFARS). The DFARS requires a DoD PM to develop a business case and receive a waiver from the Milestone Decision Authority (MDA), see Figure 3, in order to use EVM on a FFP contract. If EVM is being contemplated for use on a FFP contract, the EVMIG provides a list of the factors that should be considered prior to making a final decision:

- Effort is development in nature and involves a high level of integration
- Complexity of the contracted effort (e.g., state-of-the-art research versus commercial off the shelf (COTS) procurement of items already built in large numbers)
- Schedule criticality of the contracted effort to the overall mission of the program. Items required to support another program or schedule event may warrant EVM requirements
- Since cost risk exposure is minimized in a FFP environment, the Government may elect to receive only the IMS in order to manage schedule risk
- Nature of the effort, e.g., software intensive effort, is inherently risky
- Contractor performance history as demonstrated by prior contracts with CPR data or documented in Contractor Performance Assessment Reports (DCMA, 2006, p. 15).

According to the FAR, part. 16.202-2. FFP contracts are “best suited for acquiring supplies or services on the basis of reasonably definite functional or detailed specifications”, so perhaps the bigger question to be answered would be why risky or ill-defined work of the nature described above are being procured using a FFP contract in the first place.

It should be pointed out there is a distinction between the contractor independently choosing to use EVM to internally manage the program and DoD’s formal requirement for the contractor to use EVM to manage the program. Often contractors use EVM internally to manage FFP contracts since they must know their progress and expenditures to track how much profit they will earn, but how they internally manage their cost on a FFP contract is at the contractor’s discretion.

Another important point that should be addressed is FFP contracts should not be confused with Fixed-Price Incentive Fee (FPIF) contracts. FPIF contracts, just like cost reimbursement type contracts, require EVM if they meet contract value thresholds. This difference becomes increasingly important due to several recent initiatives where DoD is strongly encouraging the use of FPIF contracts. In his September 14, 2010 Memorandum for Acquisition Professionals, the Under Secretary of Defense for Acquisition, Technology and Logistics, Dr. Ashton B. Carter

stated “[the FPIF contract]...should be the contracting officer’s point of departure wherever conditions obtain (or can be created) that make it appropriate.” (Carter, 2010, p.6).

Cost-Reimbursement Contracts

There are six types of cost-reimbursement contracts indentified by the FAR:

- Cost Contracts
- Cost-Sharing Contracts
- Cost-Plus Incentive Fee Contracts
- Cost-Plus Award Fee Contracts
- Cost Plus Fixed Fee Contracts (FAR, Part 16)

All of these contract types would require EVM as a management tool to provide adequate government oversight of the contractor’s performance if they exceed the EVM contract value thresholds, which is the final consideration that must be met in order to apply EVM to a contract.

Decision Three: What is the Contract Value

The third and final step in the EVM determination process is a tiered approach based on the value of the program (DAU, 2011, Lesson 2, slide 12). See Figure 4. The first major contract value threshold is \$20 million and the second significant contract value threshold is \$50 million. These thresholds are fairly straightforward. The real challenge for many programs is deciding what costs should or should not be included in developing the EVM threshold. EVM can be applied not only to a prime contractor but also to major subcontractors as a flow down and even to intra-government agencies. All threshold values are calculated in Then-Year dollars. If contract type is mixed, then apply guidance separately to different parts of contract, usually based on the Contract Line Item Number (CLIN).

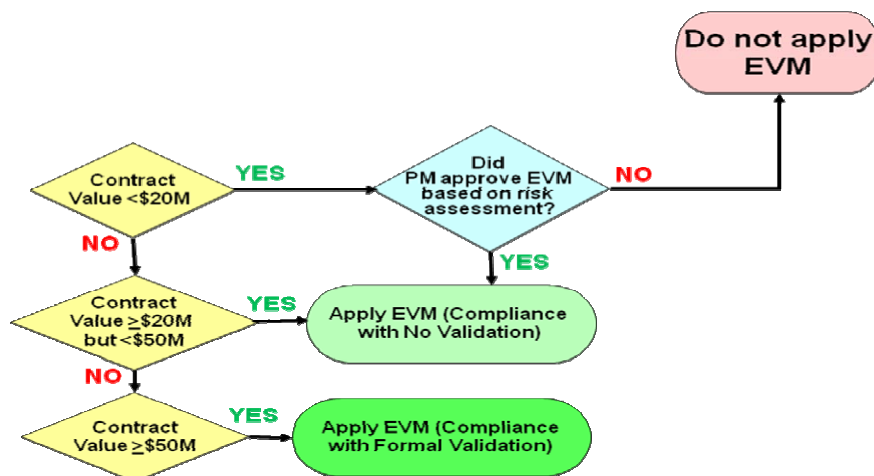


Figure 4. Step Three: Contract Value

Contracts < \$20 Million

For contracts with a total value less than \$20M but an answer of “yes” in Steps One and Two was achieved, the PM, at his discretion, can require EVM. His decision should be risk-based and carefully considered based on the EVM maturity of his PMO staff and a cost/benefit analysis. A couple of issues a PM might consider before making a determination to apply EVM to a contract valued below \$20 million.

- The total contract value including planned options. If the value of a contract is expected to grow to reach or exceed \$20M, the PM should consider imposing an EVM requirement on the contract.
- Earned value implementation costs with respect to the total contract value. Implementation should not be seen as a cost driver.
- Type of work and level of reporting available. Developmental or integration work is inherently more risky to the Government and reporting should reflect how programs are managing that risk basis.
- Schedule criticality of the contracted effort to a program’s mission. Items required to support another program or schedule event may warrant EVM requirements. (DCMA, 2006, p. 12)

Contracts \geq \$20 Million but $<$ \$50 Million

All cost reimbursement or incentive contracts equal to or greater than \$20M require the contractor to manage his program with an Earned Value Management System (EVMS) in compliance with guidelines in American National Standards Institute/Electronic Industries Alliance Standard 748, Earned Value Management Systems (ANSI/EIA-748).

Contracts \geq \$50 Million

An EVMS formally validated by DCMA to be in compliance with ANSI/EIA-748 is required for cost reimbursement or incentive contracts equal to or greater than \$50M.

EVM Contract Requirements

If all three decision points in the EVM determination process are answered with a “yes”, EVM is required. The following EVM-related contractual elements, arranged in the order they appear in the Request for Proposal (RFP), are provided below.

Section B - Supplies or Services and Prices/Cost

Section B contains a listing of all supplies, data and services to be acquired. Contract line items should be established for items to be delivered to the government and/or services to be performed. If the work is organized into portions that require EVM and portions that do not, the work should be in different CLINs since each Contract Line Item Number (CLIN) listed in Section B must be defined and described in detail in Section C so that both government and contractor personnel fully understand the work to be accomplished and what needs to be managed using EVM and what does not. This is critical for establishing the Performance

Measurement Baseline (PMB). The PMB is defined in the EVMIG as the time-phased budget plan for accomplishing work, against which contract performance is measured and a crucial element of EVM.

Section C - Statement of Work

- The Statement of Work should contain statements requiring:
- Development of a contract work breakdown structure (CWBS) at a level adequate for management and contract control
- The contracted technical effort to use a guidelines-compliant EVMS that correlates cost & schedule performance with technical progress
- Designation of critical subcontractors by name for EVM compliance and flow down of EVMS compliance to subcontractors
- An Integrated Baseline Review (IBR)
- Reference to EVMS data items as part of Integrated Program Management reporting

The Statement of Work (SOW) shall not contain guidance or direction that conflicts with, removes, or adds work scope to the contractor's validated EVMS (required by imposition of Defense Federal Acquisition Regulation Supplement (DFARS) 252.234-7002). Consult the Defense Contract Management Agency (DCMA) for guidance on compliance of the contractor's EVMS.

Suggested SOW verbiage follows:

Contractor Integrated Performance Management. The contractor shall establish, maintain, and use in the performance of this contract, an integrated performance management system. Central to this integrated system shall be a validated Earned Value Management System (EVMS) in accordance with Defense Federal Acquisition Regulation Supplement (DFARS) 252.234-7001, DFARS 252.234-7002, and the EVMS guidelines contained in ANSI/EIA-748. To establish the integrated performance management system, the EVMS shall be linked to and supported by the contractor's management processes and systems to include the integrated master schedule, contract work breakdown structure, change management, material management, procurement, cost estimating, and accounting. The correlation and integration of these systems and processes shall provide for early indication of cost and schedule problems, and their relation to technical achievement. (DI-MGMT-81466A)

Integrated Master Schedule (IMS). The contractor shall develop and maintain an Integrated Master Schedule (IMS) by logically networking detailed program activities. The schedule shall contain the planned events and milestones, accomplishments, exit criteria, and activities from contract award to the completion of the contract. The contractor shall quantify risk in hours, days, or weeks of delay and provide optimistic, pessimistic, and most likely duration for each IMS activity and event. (DI-MGMT-81650)

Integrated Baseline Reviews (IBRs). The contractor shall engage jointly with the Government's program manager in Integrated Baseline Reviews (IBRs) to evaluate the risks inherent in the

contract's planned performance measurement baseline. Initially, this shall occur as soon as feasible but not later than six months after contract award, and subsequently following all major changes to the baseline. Each IBR should verify that the contractor is using a reliable performance measurement baseline, which includes the entire contract scope of work, is consistent with contract schedule requirements, and has adequate resources assigned. Each IBR should also record any indications that effective Earned Value Management (EVM) is not being used. IBRs should also be conducted on subcontracts that meet or exceed the EVM application threshold. The prime contractor shall lead the subcontractor IBRs, with active participation by the Government. (See DFARS 252.234-7002)

Section H- Special Clauses or Provisions

The contract shall not contain special clauses or provisions in Section H that conflict with, remove, or add work scope to the contractor's validated EVMS (required by imposition of DFARS 252.234-7002). Consult DCMA for guidance on compliance of the contractor's EVMS.

Section I - General Provisions: Defense Federal Acquisition Regulations Supplement Clauses

The Federal Acquisition Regulation (FAR) contains EVMS clauses for use by the Federal civilian agencies; however, on DoD contracts, the DFARS EVMS clauses will be used instead of the FAR EVMS clauses (see DFARS 234.203).

- Notice of Earned Value Management System (Apr 2008), DFARS 252.234-7001.
- Earned Value Management System (Apr 2008), DFARS 252.234-7002. (DAU, 2011, Lesson 2, slide 22)

Section J - Exhibits/Attachments

The Contract Data Requirements List (CDRL) is used to put Contract Performance Report (CPR) and Integrated Master Schedule (IMS) reports on contract. EVM CDRLs can and should be tailored within bounds of policy. Consider all risk factors when tailoring DiDs:

- Type of contract (determined by cost risk)
- Technology
- Schedule
- Past contractor performance

Most aspects are tailorable for contracts < \$50M but tailoring options are limited for contracts > \$50M. The following DiDs are required whenever EVM is required:

CPR (DI-MGMT-81466A).

The CPR CDRL for contracts less than \$50M may tailor down the DiD to accommodate program information needs. The CPR Contract Data Requirements List (CDRL) for contracts of \$50M or

greater will require all five CPR formats. CPR requirements that could be tailored include but are not limited to:

- Format 1 & 2 Reporting Levels
- Reporting Frequency
- Submission Dates
- Date of first and last reports
- Format 5 variance reporting thresholds
- Fixed Number of Variances
- Percentage or Dollar Thresholds
- Specific Variances
- Contractor format
- Electronic data interchange format (DAU, 2011, Lesson 2, slide 24)

IMS (DI-MGMT-81650)

In the case of the IMS CDRL, the IMS DID for contracts less than \$50M may also be tailored down based on the contract value and relative information needs. IMS requirements that could be tailored include but are not limited to:

- Degree of networking
- Reporting Frequency
- Submission Dates
- Date of first and last reports
- Frequency of schedule risk analysis
- Electronic data interchange format

Contract Work Breakdown Structure (CWBS) (DI-MGMT-81334C)

A product-oriented Contract Work Breakdown Structure (CWBS) in accordance with the DoD WBS Standard (MIL-STD-881) and the CWBS DiD (DiD number DI-MGMT-81334C) is mandatory when EVM is implemented and a CPR and an IMS are required. For contracts that require Contractor Cost Data Reports (CCDRs), the CWBS will be developed, approved, and maintained in accordance with DoD 5000.04-M-1, Cost and Software Data Reporting Manual, and the CWBS DiD. A single CWBS will be developed and maintained for all contract reporting.

Contract Funds Status Report – (DI-MGMT-81468A)

A Contract Funds Status Report (CFSR) (DiD number DI-MGMT-81468A) is required. No specific dollar thresholds are established for the CFSR, but application to contracts of less than \$1.5 M should be carefully evaluated.

Section L – Instructions to Offerors

Section L is guidance to bidders for the assembly of their proposals. Each offeror's proposal shall include a description of the EVMS to be used in accordance with the appropriate RFP DFAR clauses. If the contract is over \$50 M and formal validation of the contractor's EVMS is required, the contractor must provide a reference to their Advance Agreement/ Letter of Acceptance and a copy of the approved EVM system description or a plan to obtain EVM validation to include how the system will be validated. If the contractor is valued less than \$50 M, a written summary of the proposed EVMS reference in sufficient detail to show how it addresses all ANSI/EIA-748 guidelines is required.

Section M – Evaluation Factors for Award

Evaluation of the proposed EVMS is normally undertaken as part of the proposal evaluation process to determine the probability of the system meeting the guidelines. For existing EVM Systems, evaluation may consist of a confirmation that the referenced validation is accurate and current. The system should be currently in use, and surveillance should not have identified significant, uncorrected problems. For EVMS (without validation) - the EVM System Description should be evaluated for completeness against the guidelines in ANSI/EIA-748. An on-site examination of a proposed EVMS should not normally be required during proposal evaluation. But if deficiencies are identified, written communications or an on-site visit may be required when approved by the Source Selection Board and Procuring Activity. DCMA should be contacted and asked to provide insight regarding EVMS capability, quality, and past performance with regard to EVM compliance of the offerers. Include consideration for validated EVMS (if applicable) or a viable plan to achieve validation.

Award or Incentive Fee

The DoD EVMIG contains guidance for developing award fee criteria related to EVM. Award or incentive fees are powerful tools when dealing with process issues. With award or incentive fees it is important to establish criteria up front. Be especially careful not to incentive the wrong thing. For example, do not solely have a CPI or SPI as a criteria, as it may cause your contractor to give you what you ask for instead of being forthcoming and accurate with the data. Also, do not award hard-set calendar dates for activities. It is better to make them event-driven. If you tie large sums of incentive money to conducting a review by a certain date, the contractor will ensure the review happens whether they are really ready or not. The following list from DAU's BCF 262 – EVMS Validation and Surveillance Course provides some good and bad examples of award/incentive fee criteria.

Good Examples

1. The effectiveness of the contractor's cost control is a good example of an attribute the government should encourage through the use of awards or incentives. The contractor's ability to maintain sound cost control procedures to effectively control cost growth will be evaluated during all award fee period(s) or can contribute to the incentive price. The ability to anticipate potential cost growth issues, develops cost control measures, and mitigate as best as possible unplanned contract cost problems will be evaluated. Evidence of good cost control include the contractor's ability to:

- Establish & commit to cost, schedule & performance baseline for prime & subcontractors, & manage to this baseline.
 - Provide timely and realistic Estimate at Completion assessments for prime and subcontractors including potential risk and cost containment measures.
 - Analyze and aggressively mitigate any cost and schedule issues for prime and subcontractors through early identification and use of innovative solutions.
 - Demonstrate contractor's responsiveness to cost, schedule, performance & management issues, inclusive of subcontractors.
2. The extent the contractor meets program schedule baseline (IMS), inclusive of subcontracted effort.
 3. The effectiveness of the contractor's management of program, including integration of engineering, manufacturing, and support disciplines to enable a transition through Systems Development and Demonstration and into production.
 4. The degree to which the contractor communicates with the Government in an open, timely, accurate, & appropriate fashion, and demonstrates proactive teamwork with suppliers, associate contractors, & the Government team.
 5. The effectiveness & efficiency of the contractor's technical, schedule, & cost management of its subcontractors and other suppliers.
 6. The effectiveness of the contractor to identify, mitigate, and manage risk elements through resolution, inclusive of subcontracted efforts.
 7. Successful Integrated Baseline Review (IBR)
 - Provide a coordinated, executable, integrated baseline that meets program requirements.
 - The lowest levels on Cost Performance Report & Integrated Master Schedule are integrated and traceable.
 - Program Management Baseline (PMB) is complete, captures the entire scope of work and has adequate resources to meet schedule requirements and planned program tasks.
 - Provides an effective Management Reserve Execution Plan (requiring Level I IPT concurrence prior to utilizing MR).
 8. Effective, proactive use of Earned Value Management (EVM) to manage the critical path, predict and mitigate cost and schedule risks and execute program/meet requirements within schedule and budget.

Bad Examples:

- Example #1: Contractor will receive Award Fee based on a $CPI > 1.00$;
- Example #2: Contractor will receive 80% of Award Fee if $CPI > 0.98$.
- Example #3: Contractor will not receive Award Fee if $CPI < 0.98$.

Conclusion

Requiring EVM implementation on a program is a big decision that should not be made lightly. The PM should carefully consider the risks identified with the program, costs versus

benefits and current EVM mandates. If the decision to use EVM is made, the PM should ensure his PMO is adequately staffed with the appropriate number of personnel possessing the experience and knowledge to conduct the various EVM-related responsibilities such as oversight of the contractor and conducting the IBR. DAU can help with this task through existing training and specialized Mission Assistance if necessary. For more information concerning assistance with implementation of EVM within DoD, please contact either DCMA or DAU.

References

- Carter, A.B. (2010). Memorandum for Acquisition Officials. Subject: Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending. Under Secretary of Defense, Acquisition, Technology and Logistics, Pentagon. Retrieved from: <https://acc.dau.mil/CommunityBrowser.aspx?id=395003>
- Defense Acquisition University (2008). Earned Value Management Contract Checklist. Retrieved from: <https://acc.dau.mil/CommunityBrowser.aspx?id=144762&lang=en-US>
- Defense Acquisition University (2011). BCF 203 - Intermediate Earned Value Management Course. E. Barber, Course Manager.
- Defense Acquisition University (2011). BCF 262 – EVMS Validation and Surveillance. K. Hunter, Course Manager.
- Defense Contract Management Agency. (2006). Department of Defense Earned Value Management Implementation Guide. Retrieved from: <https://acc.dau.mil/CommunityBrowser.aspx?id=19557>
- Defense Acquisition Regulation Supplement. Retrieved from: <http://www.acq.osd.mil/dpap/dars/dfarspgi/current/index.html>
- Federal Acquisition Regulation. (2005). Part 16. Types of Contracts. Retrieved from: <https://www.acquisition.gov/far/html/FARTOCP16.html>