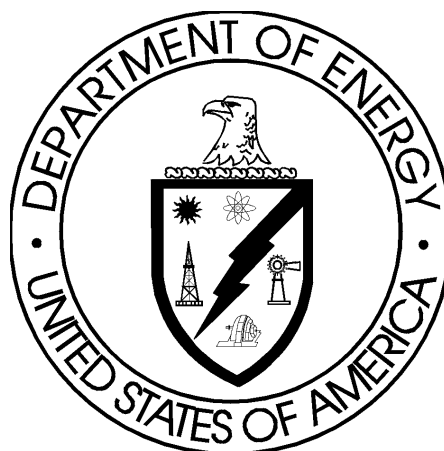


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**DOE G 413.3-10A
3-13-12**

EARNED VALUE MANAGEMENT SYSTEM (EVMS)

[This Guide describes suggested nonmandatory approaches for meeting requirements. Guides are not requirements documents and are not to be construed as requirements in any audit or appraisal for compliance with the parent Policy, Order, Notice, or Manual.]



U.S. Department of Energy
Washington, D.C. 20585

FOREWORD

This Department of Energy (DOE) Guide is for use by all DOE elements. This Guide intends to provide approaches for implementing the Earned Value Management System (EVMS) requirements of DOE O 413.3B, *Program and Project Management for the Acquisition of Capital Assets* in compliance with the American National Standards Institute/Electronic Industries Alliance (ANSI/EIA)-748-B, *Earned Value Management Systems*. DOE Guides, which are part of the DOE Directives System, provide supplemental information for fulfilling requirements contained in rules, regulatory standards, and DOE directives. Guides do not establish or invoke new requirements nor are they substitutes for requirements. For those PMSOs who are exempt from DOE O 413.3B, the PMSO fulfills the role of OECM in this guide.

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SECTION I —INTRODUCTION

1. GOAL

To support DOE's initiatives to improve program, project, and contract management through the implementation and surveillance of a contractor's Earned Value Management System (EVMS) that is in conformance with DOE O 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, the American National Standards Institute/Electronic Industries Alliance (ANSI/EIA)-748-B, *Earned Value Management System* (or as required by contract), and Federal Acquisition Regulation (FAR) 52.234-4, *Earned Value Management System (EVMS)*.

The primary audience of this guide is the Federal Project Director (FPD) and other DOE elements. It is critical that the FPD understands the EVMS process and procedures and utilizes the EVMS information as an effective project management tool to ensure successful project execution and to fulfill their roles and responsibilities as outlined in DOE O 413.3B. This guide is also useful to contractors where EVMS is required.

2. OBJECTIVE

To provide an overview of the DOE EVMS that:

- a. Describes the EVMS and associated critical information available to the FPD, federal program manager, other senior leaders, and contractors, and suggests how to use them. To these ends, this guide:
 - (1) Suggests a common reporting format to communicate EVMS consistently across DOE.
 - (2) Promotes implementation of EVMS as early in a project life cycle as practical.
- b. Describes the certification process for a contractor's EVMS. See SECTION III.
- c. Describes the EVMS surveillance process to ensure ongoing EVMS compliance. See SECTION IV.
- d. Describes EVMS-related best practices that are accepted throughout government and industry in implementing and using EVM. See APPENDIX A.**Error! Reference source not found..**

This guide is not intended to be a comprehensive training document, a detailed system requirement, or a contractual implementation requirement. Those topics are beyond the scope of this guide; however, FPDs and other DOE elements are encouraged to contact the Office of Engineering and Construction Management (OECM) for consultation. Additional references are listed in APPENDIX A.

3. APPLICABILITY

To FPDs and other DOE elements, including contractors, for which EVMS is required by DOE O 413.3B and contractual requirements. FAR 52.234-4, *EVMS*, requires compliance with the current version of ANSI/EIA-748 at the time of contract award.

4. REVIEW TERMINOLOGY

The following key terms and explanations are provided to facilitate the understanding of EVMS certification and surveillance reviews:

- a. Certification Review: A process used to determine that a contractor's Earned Value Management System (EVMS) is in full compliance with the ANSI/EIA-748-B, or as required by the contract, and in accordance with FAR clause 52.234-4, *EVMS*, and the system has been properly implemented on the contract being reviewed. A Certification Review is conducted on site. Note that while different Civilian Federal Agencies (CFA) and the Department of Defense (DoD) may use review processes with a synonymous intent and refer to them as validation, compliance, or acceptance, DOE chooses the term 'certification'.
- b. DOE Certifying Authority: As defined by dollar thresholds in DOE O 413.3B, for a contractor with a project portfolio with at least one project with a Total Project Cost (TPC) between \$50M to \$100M, the Project Management Support Office (PMSO) may lead or request OECM to lead the review. For a contractor with a project portfolio of at least one project with a TPC equal to or greater than \$100M, OECM leads the review. The guide will use the term DOE Certifying Authority to identify EVMS roles and responsibilities that may be performed by either the PMSO or OECM, depending on these thresholds.
- c. Self-Certification Review: A process whereby the contractor conducts a self-assessment either (1) in assessing readiness for a Government-led certification, or (2) when all the capital asset projects include only TPCs between \$20M and \$50M and if the contractor is not already certified. The FPD is responsible as stated in DOE O 413.3B to ensure that the self-certification is conducted. FPD/site office oversight of the self-certification is preferred as the means to gain confidence in the contractor's EVMS implementation.
- d. Surveillance Review: A review conducted to demonstrate continued compliance of a certified system to the ANSI/EIA-748-B, or as required by the contract, and in accordance with FAR clause 52.234-4, *EVMS*, to ensure company processes are being followed, verify the EVM data is useful, timely, and effective, and assess whether the data is used to make informed decisions. Surveillance Reviews conducted by the FPD staff would be on site; those reviews conducted by the PMSO and OECM may be conducted as desk reviews or on site depending on the pre-review risk assessment.

- e. Implementation Review: An Implementation Review is a special type of surveillance performed in lieu of a Certification Review when EVMS compliance is a requirement. This type of review extends the certification of a contractor's previously certified system. It may be conducted on site or as a desk review depending on the risks associated with the nature of the extension. A contractor's certified system may be extended in the following situations:
 - (1) From one contractor facility to another,
 - (2) From one project to another project after a period of system non-use,
 - (3) A previously certified system description to a significantly revised system description, and
 - (4) From one certifying entity to another (meaning CFA or DOD to DOE, or PMSO to OECM) provided the contracting entity remains the same.
- f. Review for Cause (RFC): The decision to conduct a RFC occurs based on EVMS surveillance activities. For example, the RFC may result from contractor failure to adequately address or remedy previously identified Corrective Action Requests (CARs) issued during EVMS surveillance. A key element in the decision to conduct an RFC is to determine whether the EVMS may still be relied upon to provide reliable and accurate project or program information to the FPD or other DOE elements, or whether the EVMS certification should be suspended or withdrawn. Considerations should include the contractor's progress against corrective action plans and accuracy of performance data generated. A RFC would typically be done on site.

SECTION II —EVMS

1. DESCRIPTION

a. What is an EVMS?

EVMS is an integrated set of policies, procedures, and practices necessary to provide reliable and accurate project and program information to support project management as a decision making tool and a critical component of risk management. An EVMS:

- (1) Effectively integrates a project's work scope, cost, and schedule into a single performance measurement baseline (PMB).
- (2) Reliably tracks:
 - (a) planned value (PV) of work to be performed or the budgeted cost for work scheduled (BCWS),
 - (b) earned value (EV) of actual work performed or the budgeted cost for work performed (BCWP), and
 - (c) actual cost (AC) of work performed (ACWP).
- (3) Provides performance measurements against the PMB.
- (4) Provides means of maintaining the integrity of the PMB by identifying, reviewing, approving, and incorporating changes in a timely manner.
- (5) Provides reliable information necessary for trend analysis and evaluation of estimated costs based on performance used to predict future performance and arrive at an estimate to complete (EAC).
- (6) Provides a sound basis for problem identification, corrective actions and management.

b. What is the purpose?

EVMS measures actual performance of work scope and the associated cost and schedule versus an agreed to baseline plan, while using disciplined means of baseline change control for documenting any changes to the agreed to baseline plan.

c. Why use it?

EVMS is a best practice and standard adopted by the Federal Government and the project management industry. DOE O 413.3B, the Office of Management and

Budget (OMB), and the Federal Acquisition Regulation (FAR) Part 34.2 require EVMS.

Active post CD-2 projects with a TPC greater than or equal to \$20M are required to provide EVMS data as part of their OMB Exhibit 300, Capital Asset Plan and Business Case Summary. For specifics, refer to the Department's annual budget calls.

- d. When is it used?
 - (1) EVMS should be implemented as early as possible in a project's life cycle.
 - (2) By no later than CD-2, the performance baseline (PB that includes the contractor's PMB) must cover the entire project life cycle, i.e., through CD-4.
 - (3) DOE O 413.3B requires EVMS on capital asset projects with a total project cost (TPC) greater than or equal to \$20M, and monthly reporting of earned value data via DOE's Project Assessment and Reporting System (PARS II) after CD-2. [Note: EVMS is not required on firm fixed price contracts where DOE has privity of contract.]
- e. When is certification of an EVMS required?
 - (1) DOE O 413.3B requires for projects greater than or equal to \$20M that the contractor employ an ANSI/EIA-748-B compliant EVMS by CD-2. The contractor's EVMS should be certified as soon as possible, but no later than CD-3. In most cases, EVMS certification will be a condition for CD-3 approval. Therefore, efforts need to be made to plan and execute the certification process on a schedule that can meet this requirement.
 - (2) Certification of a contractor's EVMS applies as follows:
 - (a) For a contractor where the portfolio includes EVMS- applicable projects with only TPCs between \$20M and \$50M, DOE O 413.3B requires self-certification by the contractor; this does not preclude contractors from obtaining certification by PMSO or OECM;
 - (b) For a contractor where the portfolio includes one or more EVMS- applicable projects with a TPC equal to or greater than \$50M but none equal or greater than \$100M, DOE O 413.3B requires certification by the PMSO with OECM representation or OECM lead upon request; and
 - (c) For a contractor where the portfolio of EVMS-applicable projects includes an EVMS-applicable project with a TPC equal to or greater than \$100M, DOE O 413.3B requires certification by OECM with PMSO representation.

f. What are the criteria?

- (1) EVMS must comply with DOE O 413.3B, ANSI/EIA-748B (or as required in the contract), FAR 52.234-4, and other contractual requirements.
- (2) Additional clarification on ANSI/EIA-748-B is provided by the National Defense Industrial Association (NDIA), Program Management Systems Committee (PMSC), *Earned Value Management Systems Intent Guide*.
- (3) Additional references are listed in APPENDIX A.

g. When should certification be scheduled?

- (1) DOE O 413.3B requires that a contractor employ a certifiable EVMS at CD-2 based on previously stated thresholds. As a rule of thumb, at least three months of data generated by the EVMS is needed before a thorough test of the EVMS can be conducted to demonstrate implementation of a certifiable system. Certification is required by CD-3.
- (2) If contractor self-certification is required, the FPD ensures the self-certification is conducted appropriately.
- (3) If PMSO or OECM certification is required, the FPD should contact the appropriate certifying authority to coordinate the review schedule.

2. CRITICAL INFORMATION AND SUGGESTED USES

Following are some critical items and issues that FPDs and other DOE elements should closely monitor to ensure successful EVMS implementation and continued compliance. Refer to APPENDIX B for DOE EVMS Gold Card with formulas and definitions. Also refer to <http://energy.gov/management/office-management/operational-management/project-management/earned-value-management> for more information on topics relating to EVMS, best practices, sample templates, and recommended processes.

a. Variances

- (1) Identifies cost, schedule, and estimate at completion (EAC) deviations from the PMB and should be reviewed to ensure that their causes, corrective action plans (CAPs), and impacts to the project are clear, meaningful, and attempt to recover negative deviations from the plan and address reasons for significant positive deviations from the plan.
- (2) FPDs should ensure that variances are accurately reported for the current month, cumulative-to-date, and against the budget at completion (BAC) and should monitor the variance analysis reports and the effectiveness of corrective actions.

- (3) When addressing variances, records of historical performance against the plan must not be erased, unless to correct errors, routine accounting adjustments, effects of customer or management directed changes, or to improve the baseline integrity and accuracy of performance measurement data. Together with the remaining management reserve (MR) and DOE contingency, updated EACs, and other factors, it is critical to understand whether a project is in danger of exceeding the contract budget base (CBB) or the PB.
- (4) Possible cost variance (CV) causes include the following
 - (a) Rate changes (i.e., labor, overhead),
 - (b) Inadequate estimating (i.e. more or less labor required than planned),
 - (c) Vendor discounts or price increases,
 - (d) Quantity discounts,
 - (e) Material cost changes, and
 - (f) Requirement changes.
- (5) Possible schedule variance (SV) causes include
 - (a) Poor baseline schedule (does it reflect reality?),
 - (b) Subcontractor/vendor cannot deliver when needed,
 - (c) Inadequate estimating (i.e. more or less time required to complete the effort than planned),
 - (d) Insufficient resources (staffing),
 - (e) Labor disputes/work stoppage,
 - (f) Resource availability (is it there when I need it?), and
 - (g) Requirement changes.

b. Indices

- (1) Indices measure how efficiently a project has executed the PMB to the present time. They should be closely monitored. They are good indicators that may predict future performance but they do not stand alone. For example, an analysis of performance against the critical path is also important to see how work is progressing relative to critical path activities.

- (2) Schedule performance index (SPI) indicates how much work you have accomplished against the planned work. “How am I doing against my plan?” Current month and cumulative data should be assessed and trended. Current month data should be assessed for adherence to plan in fine detail while cumulative data gives overall progress towards project completion goals.
- (3) Cost performance index (CPI) indicates how much effort, efficiency, or return of value you are getting for every dollar spent. “Am I getting the best bang for the buck?” Current month and cumulative data should be assessed and trended.
- (4) To complete performance index (TCPI) indicates the budget for work remaining versus the estimate for work remaining. “Do I have adequate resources capable to complete at the efficiency required to achieve my estimate to complete?” $TCPI_{BAC}$ indicates the level of efficiency that must be achieved for the cost at completion to equal the BAC. $TCPI_{EAC}$ indicates the level of efficiency that must be achieved for the cost at completion to equal the EAC.

c. Baseline Management

Baseline management is crucial for properly documenting, approving, and implementing changes to the PMB and for understanding if the project is in danger of exceeding the CBB or the PB.

d. Acquisition Process

The request for proposal should specify what is required of the contractor as it relates to EVMS, and should make specific reference to contractor requirements, including ANSI/EIA-748-B, FAR 52.234-4, and DOE O 413.3B.

e. Contracting for EVM

Consideration of using EVM on projects begins in the acquisition planning phase. To instill confidence that EVM is adequately addressed, acquisition staff should plan for EVM and structure the solicitation to ensure that the requirement is addressed throughout every step of the acquisition process. This examination continues through the solicitation, source selection and post-award, and then throughout the execution phase.

The risk associated with the project is the primary factor in determining whether to apply Earned Value Management. OMB Circular A-11 requires that all major acquisitions with development effort include the requirement for the contractor to use an Earned Value Management System (EVMS) that meets the guidelines in ANSI/EIA-748-B to manage contract performance. The determination, rationale,

and planning for EVM should be a key element in the acquisition strategy. DOE O 413.3B requires EVMS on contracts equal to or greater than \$20 million except for firm fixed-price contracts. In the case of firm fixed-price contracts, it is encouraged but not mandated. Refer to DOE O 413.3B, Attachment 1 for more information.

EVM is typically addressed in various sections of all solicitations or contracts for projects requiring its use.

- (1) Section B – Supplies or Services and Price/Costs – identifies deliverable requirements and negotiated prices.
- (2) Section C – Description/Specifications/Statement of Work - identifies the work that the contractor is expected to perform. Be clear in identifying EVM deliverables. Recommended deliverables would include Contract Performance Report Formats 1-5, an Integrated Master Schedule, and a Contract Funds Status Report. This may be identified in the SOW or in a Special H Clause.
- (3) Section H – Special Contract Requirements - Project Control Systems and Reporting Requirements – defines specific requirements relating to project controls and reporting
- (4) Section I – Contract Clauses – defines the necessary and appropriate clauses.
- (5) Section J – List of Attachments – defines the standards and guidance the contractor is to employ in performing and delivering the product or service.
- (6) Section L – Instructions, Conditions, and Notices to Offerors or Respondents – defines what the contractor must address in their proposal.
- (7) Section M - Evaluation Factors for Award - defines how the contractor's proposal will be evaluated

f. Work Breakdown Structure

- (1) In conformance with ANSI/EIA-748-B, a product-oriented WBS is the cornerstone of a program as it defines in detail the work necessary to accomplish the program's objectives. As an essential program management tool, the WBS provides a basic framework for not only the project but a variety of related activities to include estimating costs, developing and maintaining schedules, determining where risks may occur, budgeting, contractual obligations, and providing the means for measuring project performance using EVM. The WBS should align as closely as possible to the OMB Circular A-11 definition of the components of each useful segment. A useful segment is defined as an economically and programmatically separate capital investment that

provides a measurable performance outcome for which the benefits exceed the costs, even if no further funding is appropriated. Segments are usually separate phases of a project that may share some common product-oriented WBS elements.

- (2) As identified by GAO Cost Estimating and Assessment Guide (GAO-09-3SP) as a best practice, a product-oriented WBS decomposes elements into a hierarchical structure that relate to one another as well as to the overall end product. Each level of decomposition (child level) represents 100 percent of the work applicable to the next higher (parent) element. Many experts in cost estimating consider this a best practice because the product-oriented WBS ensures that all costs for all deliverables are identified. Figure II-1 provides the hierarchical relationship of a notional capital asset project with multiple facilities (buildings), their sub elements (Structure, Utility, etc), and various common elements.

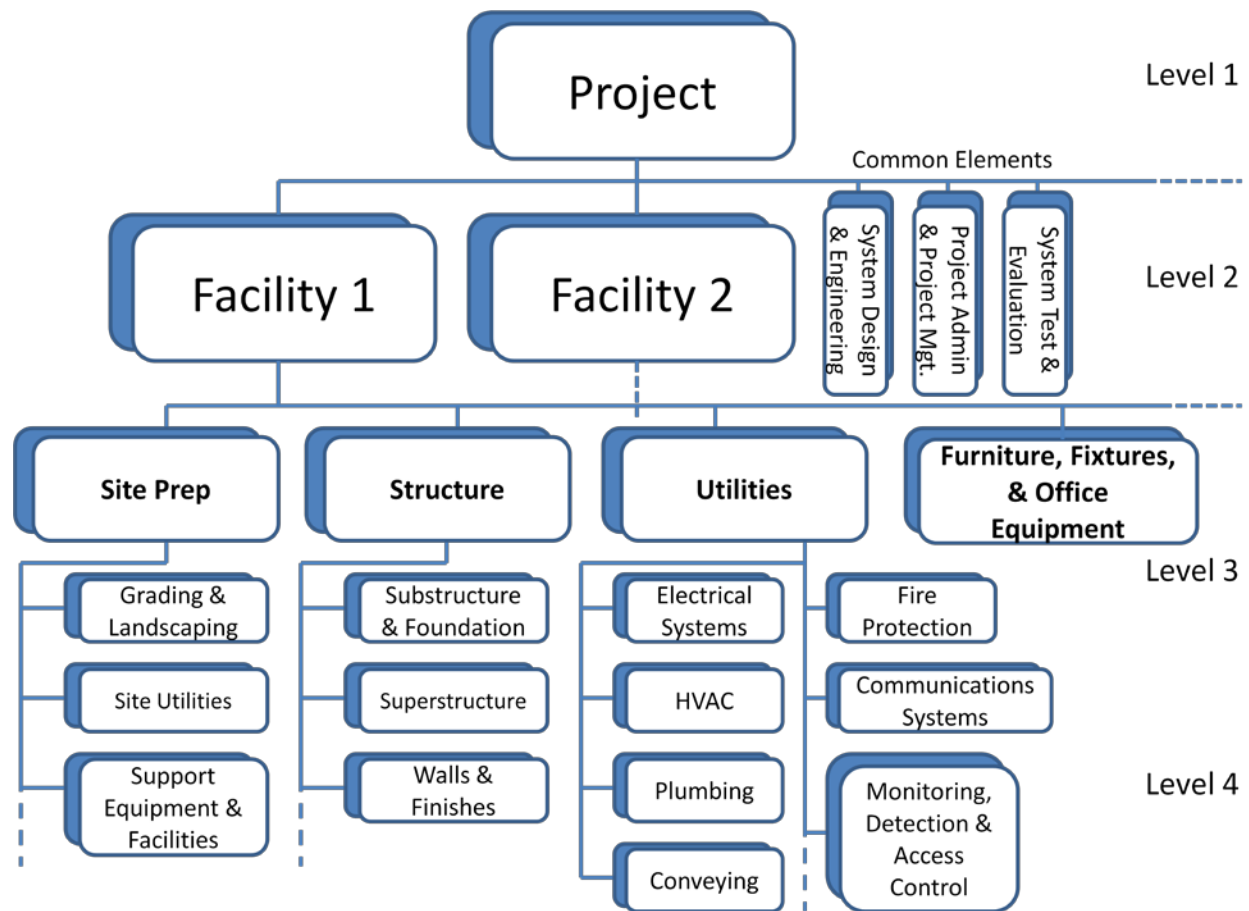


Figure II-1. Product-Oriented WBS Example

- (3) The product- oriented WBS assists EVM in several ways during the project life cycle:
- (a) Segregates a project into its components, clarifying the relationship among the components, and clarifying the relationship of the tasks to be completed—to each other and to the end project.
 - (b) Facilitates effective planning and assignment of management and technical responsibilities.
 - (c) Aids status tracking of technical efforts, risks, resource allocations, expenditures, and cost/schedule/technical performance.
 - (d) The use of common WBS elements within an organization across multiple projects will enhance the development of metrics and benchmarks that will improve cost estimating and proposal Basis of Estimates.

- (e) Provides a common thread for EVMS and the Resource Loaded Schedule (RLS), allowing consistency in understanding project cost and schedule performance.
- (f) Facilitates the use of direct EVM measurement techniques, as opposed to Level of Effort, by aligning tasks to deliverables.
- (4) Additional details regarding the WBS are included in [APPENDIX I](#) and specific WBS Best Practices are available at <http://energy.gov/management/office-management/operational-management/project-management/earned-value-management>.

g. Budget Versus Funds and PMB

In EVM, the distinct concepts of budget and funds are often confused and may result in non-compliance.

- (1) Funds are a *monetary resource* provided to pay for completing a statement of work as agreed to contractually.
- (2) Budgets are time-phased *estimates* to establish a PMB or “plan”.

EVM provides visibility into performance based on the time-phased budget so that future costs can be projected. Since most contracts to which EVM is applicable are cost reimbursable, tracking actual costs and estimating the cost to complete the effort is essential to funds management. The Government is responsible to manage the funding to ensure adequate funds are available to cover the allowable costs incurred in completing the project, including cost overruns against the original plan.

The most common source of confusion is when the time-phased budget is continuously revised in an attempt to match the funds. They do not need to match; the practice of forcing them to match is a likely non-compliance with ANSI/EIA 748-B. If the measurement of the work indicates that the total cost will exceed the budget, the budget does not need to be re-planned. Cost and schedule overruns are used to assist in making projections based on past efficiencies to future efficiencies. Continually replanning the baseline can distort the data used to make projections which again, are critical in arriving at an accurate EAC. The EAC is then used as part of the funds management because the actual costs incurred are part of the bill that is to be paid in the end (plus fee, etc).

When should the budget change?

- (1) As scope is added or deleted from the project, then the budget is adjusted based on the estimate associated with that scope.

- (2) The budget also changes based on the movement of management reserve to the PMB for future tasks that were unplanned but are required to meet the original statement of work. If a control account is under running, the unused budget should not be moved to management reserve. This errant practice defeats the use of EVM to forecast costs as it skews historical performance. An estimate is just that, an estimate.
- (3) If current year or out year funding profiles change via a contract modification, this may require delay or acceleration of work and the time-phasing of the existing budgets could be modified.
- (4) If due to significant changes to the technical approach, actual performance (either significantly positive/negative), or errors are identified so that the PMB is no longer a usable tool for performance measurement, then a re-baseline of future activities might be warranted (see [Change Control Guide](#)).

During the life of the project, the historical performance is a factor in projecting how much funding will be necessary to pay the bill. And when the project is completed, the historical performance against that estimate, over run or under run, can then be used in future estimating.

A best practice used often in other Departments but less common in DOE is the Contract Funds Status Report (CFSR). The purpose of the CFSR is to provide funding data used for:

- (1) Updating and forecasting contract funds requirements,
- (2) Planning and decision making on funding changes to the contract,
- (3) Developing funds requirements and estimates in support of approved projects,
- (4) Determining funds in excess of contract needs and available for deobligation, and
- (5) Obtaining rough estimates of termination costs.

Comparison between the CFSR and CPR provides visibility into tracking budget and funds, and understanding the differences. The data item description for the CFSR form is found at

[http://www.everyspec.com/DATA+ITEM+DESC+\(DIDs\)/DI-MGMT/DI-MGMT-81468_11999/](http://www.everyspec.com/DATA+ITEM+DESC+(DIDs)/DI-MGMT/DI-MGMT-81468_11999/).

h. Undefined Contract Work

When DOE authorizes a change order or additional scope for a non-M&O contract, the contractual modification issued by the contracting officer (CO) to the contractor needs to clearly describe the work. When the execution of a change order or additional scope is urgent, the CO will authorize the contractor to proceed via an unpriced contract modification. This modification will include a target date for definitization of the modification and the date the contractor will submit its proposal. The unpriced contract modification will establish a “not to exceed” cost limitation. The authorized amount correlates to block c., Est. Cost Authorized Unpriced Work, of the CPR Format 1.

The contract modification and authorization documents should clearly identify the scope of work and requirements to be added to the contract. After the contract modification is issued, the scope of work with its associated estimated cost (subject to any NTE limitation) should then be added to the PMB. If an undefinitized contract modification is issued, the PMB will need to be adjusted after the final negotiated supplemental agreement to the contract is executed.

i. Management Reserve

Contractors should be encouraged to establish a challenging PMB. However, it should be understood that there will be risk events within the contractor’s defined scope of work. A proper balance of challenge versus risks and managing risks can be the key to project success. Many of these risk events may happen and the contractor should be allowed to have budget reserved that they can use to better plan future work. This budget is called Management Reserve (MR). MR is that budget which is held outside the PMB but within the Contract Budget Baseline. It can only be used for scope that falls within the contractual statement of work but outside the scope of a control account. It is managed by the contractor and subject to change control approvals when applied.

j. DOE Contingency

In establishing the TPC for capital asset projects, DOE should account for technical and programmatic risks within project scope but outside the scope of the contract(s). It is important to account for these technical and programmatic risks by establishing a DOE contingency which would be placed on the contract as project risks may be realized. DOE contingency is budget above the CBB and controlled by the Federal personnel as delineated in the Project Execution Plan. Application of DOE contingency in terms of budget and scope to the contract is done via baseline change and requires contractual modification on non-M&O contracts. (Refer to DOE Guide 413.3-20, *Change Control Management*).

k. Change Control

- (1) Many EVM non-compliances are related to change control – primarily PMB maintenance and how MR and DOE contingency are used. It is important for the change control process to provide visibility to what is being changed (scope, budget, schedule), what prompted the change, and budget source if applicable (MR or DOE contingency). This is essential to ensure that the total project scope, cost, and schedule are managed by DOE and the contractor. Refer to DOE G 413.3-20, *Change Control Management*, for further guidance.
- (2) ANSI/EIA-748-B requires that work be performed against a planned budget. For non-M&O contracts if there is a large proposed scope change for which a significant amount of time is required prior to DOE approval, mechanisms should exist to provide “a not to exceed budget” while contract negotiations continue to resolve the final outcome. Refer to the Undefinitized Contract Work discussion in paragraph g. above.
- (3) Although budget control (which is a part of baseline change control) and funds control are often inter-related, EVM System descriptions and implementing procedures should be very clear in identifying them as separate processes. The terms should not be used interchangeably.
- (4) When describing a baseline change, the total project cost and schedule impacts need to be addressed up through CD-4 and not just the cost and schedule impacts to the annual work plan, or the current project phase (e.g., design phase).

l. Estimate at Completion

Whereas the PMB is important to measure a contractor’s performance against a plan, an EAC is necessary to understand what the anticipated total funding requirements are to complete the project. Real-time updates of EAC for individual CAs are important, however, individual CA EAC changes are often non-linear (i.e., their algebraic sum may not reflect the total impact). To better understand the EAC, a bottoms-up EAC should be required on some defined frequency. ANSI/EIA-748-B requires periodic EAC reassessments at least annually or an on-going process of EAC review and maintenance. In either case, significant EAC changes should be incorporated as they are identified to provide visibility for program management purposes and potential funding implications. The consequence of not maintaining the EAC puts the project at risk should analysis of trends indicate the TPC may be insufficient. A sign that EACs are not being properly maintained is when the cumulative ACWP exceeds the projected EAC.

m. Work Authorization Process

The contract captures and the PEP identifies the total scope of work, cost, and schedule. The contractor's work authorization process for individual CAs should be recorded in an authorizing document from the contractor's line management (e.g., project manager) to each CAM. Often what is documented is an annual work plan and not the total project plan.

n. Accruals and Estimated Actuals

Disciplined methods for planning, taking credit for actual work performed, and accounting for actual costs or estimating actual costs pending receipt of an invoice must be implemented and synchronized as required by ANSI/EAI-748-B for accurate reporting of project costs. Disciplined methods for reversing accruals (upon receipt of the invoice) must also be implemented. When these methods are not implemented, distortions to reported cost performance occur and create unreliable data for analysis purposes.

o. Earned Value Techniques

Wherever practicable, objective measures (rather than management judgment) should be used to take credit for work performed. Caution should be exercised when there is a high proportion of level of effort (LOE) work in that, for this method, the work performed always equals what was planned and by itself it never generates a schedule variance. LOE is used for support-type project activity that is done to support other work activities or the entire project effort. A best practice is to avoid mixing LOE and discrete work in the same control account since LOE work has the capacity to drastically distort evaluations of progress when its performance data is combined with that of discrete effort. If combined, the LOE work should be segregated by element of cost to allow for proper analysis of performance. Separate work packages are recommended. Further guidance regarding acceptable earned value measurement techniques can be found in the ANSI/EIA-748-B.

p. Critical Path Analysis

In addition to potential masking of schedule problems encountered for projects with a high proportion of "level of effort" work, the project-level cumulative SPI may not be a good indication of what is happening on the project critical path and does not reflect whether the critical path work is, or is not, being accomplished. In analyzing data, therefore, it is important for both the FPD and contractor to analyze more than just the cumulative indices. For example, understanding exactly what work is on the critical path, and then assessing the SPI for each of these work elements would be more meaningful. Refer to DOE O 413.3B, Attachment 1, for specific requirements regarding critical path and resource-loaded schedules.

3. TOOLS

Additional tools to better understand the terms and concepts are clarified below.

a. DOE Gold Card

APPENDIX B provides a comprehensive summary of key EVMS terms, their interrelationships, and measurement of project progress versus the plan. These terms are the foundations for reports including contract performance reports (CPRs) in APPENDIX C.

b. Contract Performance Reports

CPRs provide critical information from the contractor to their management and DOE about their performance in an organized, easy to understand format. CPRs are management reports that provide timely, reliable data that is used to assess the contractor's current and projected performance, to quantify and track known or emerging problems, to determine the contractor's ability to achieve the PMB, and to assist in decision making. It is important that the CPR be as accurate as possible so it may be used for its intended purpose, which is to facilitate informed, timely decisions.

CPRs are provided monthly and pertain to all authorized work including priced and unpriced efforts.

FAR 34.201(c) requires the CO to require contractors to submit EVMS monthly reports for those contracts for which EVMS applies. The requirement for EVM deliverables should be in the SOW or in a Special H clause.

APPENDIX C provides five CPR formats. These formats are not required by DOE. If used, they should be tailored to meet the needs of the project. When viewed in total and over a period of time, these formats can provide significant insight regarding project performance. The following are the five CPR formats:

- (1) Format 1: WBS
- (2) Format 2: Organizational Categories
- (3) Format 3: Baseline
- (4) Format 4: Staffing
- (5) Format 5: Explanation and Problem Analyses

c. CPR Checklist

APPENDIX D provides a checklist of items for the FPD to review to ensure that CPR formats 1 to 5 are properly prepared.

d. PARS II

The Project Assessment and Reporting System (PARS II) is the Department's system of record for DOE capital asset project baseline and performance information. In accordance with O 413.3B, DOE contractors are required to begin submitting monthly earned value data after CD-2 for projects having a total project cost greater than or equal to \$20M. Submission of data to PARS II is accomplished electronically in accordance with the Contractor Project Performance (CPP) Upload Requirements for Project Assessment and Reporting System (PARS II), latest version. After CD-2 approval, the required project performance data are:

1. ANSI/EIA-748-B Earned Value (EV) Data
2. EV Time Phased Incremental Cost and Quantity Data
3. Management Reserve Data
4. Schedule Data
5. Variance Analysis Narrative

Data is reported by Work Breakdown Structure (WBS) and by Organizational Breakdown Structure (OBS) down to the control account level (or lower at a Program's discretion). Performance data is reported against the latest DOE approved PMB.

PARS II is also used to maintain the list of contractors' DOE-certified Earned Value Management systems. PARS II also has many EVM-related reports for use in project analysis. More information about PARS II may be found on <http://energy.gov/management/project-assessment-and-reporting-system-pars-ii/>.

SECTION III—CERTIFICATION OF A CONTRACTOR'S EVMS

1. CERTIFICATION OVERVIEW

Certification is a process that involves reviewing and certifying that the design and implementation of a contractor's EVMS is in conformance with ANSI/EIA-748-B primarily for DOE O 413.3B projects. The certification is not to verify how well projects or the programs are doing, but to assess the capability of the system to provide an objective measure of progress and the effective use of the system by the contractor and for the Department. Project data are simply means of demonstrating EVMS compliance. Elements of the EVMS (i.e., the design as reflected by policies, procedures, and processes; and the implementation as reflected by reports and other documents) are evaluated individually and as a whole to ensure that they meet the intent of ANSI/EIA-748-B.

2. CONTRACTOR/SUBCONTRACTOR EVMS FLOW DOWN

- a. DOE O 413.3B Attachment 1 provides instruction to prime contractors for the flow down of EVMS requirements to subcontractor(s). It is the prime contractor's responsibility to report ANSI/EIA-748-B compliant data to DOE when contractually required. Utilizing EVMS Certification and Surveillance Reviews, DOE requires the prime contractor to demonstrate how they ensure the validity of the baseline, progress earned, actual costs incurred, and the estimated value of work remaining, including that of affected subcontractors.
- b. For the prime contractor to be able to successfully demonstrate the validity of the subcontractor data, the prime contractor should flow down EVMS requirements to all cost-reimbursement subcontractors. However, the prime contractor still retains responsibility for ensuring the subcontractor's data is compliant through the performance of EVMS reviews. For all firm fixed-price subcontracts, the prime contractor is responsible for ensuring an itemization and validation of the subcontractor's invoiced amounts.

3. CORPORATE CERTIFICATIONS

DOE Order 413.3B allows a contractor to adopt their existing DOE-certified EVMS for application under a new contract regardless of location. This does not apply to a new entity, such as an LLC unless that LLC has been certified and is doing business under a contract at another location. For a pre-existing certified EVMS to be considered, the certified EVMS must be implementable with only minor changes to the system description and implementing procedures. The contractor must provide the prior certification documentation along with the updated system description and implementing procedures with all changes highlighted to the responsible DOE certifying organization based on the dollar thresholds established in the Order. When a pre-existing EVMS is approved, the responsible DOE certifying organization should conduct an EVMS Implementation Review no later than approval of CD-3. Refer to Section IV of this guide for process information relative to Implementation Reviews.

4. CERTIFICATION REVIEW SCOPE

Certification review scope encompasses a project's statement of work as reflected by a project specific contract and/or Project Execution Plan (PEP).

- a. When a contractor has multiple projects, certification should be accomplished by sampling the projects that have achieved CD-2 and contain the EVMS requirement. .
- b. In the situation where a certified contractor is replaced on site by a non-certified contractor as in the case of a re-competed contract, a certification review is required. The scope and process may be streamlined depending upon the extent of use of the outgoing certified contractor's people, processes, and tools.
- c. A streamlined certification approach may also be appropriate when certified contractors join to form an LLC. The key is to assess whether a previously certified contractor's EVMS, as implemented in the LLC environment, remains compliant with the ANSI/EIA-478-B. Upon successful completion of the certification review, the LLC would receive a letter of certification.

5. CONTRACTOR SELF-EVALUATION / SELF-CERTIFICATION

- a. DOE O 413.3B requires that the FPD ensure that the contractor conducts a self-certification review for projects with a TPC between \$20M and \$50M if the contractor has no higher dollar projects and if the contractor is not already certified. DOE line management involvement of the self-certification is preferred and serves as the means to gain confidence in the contractor's EVMS implementation. A best practice is for the DOE FPD's office to participate as a team member on the contractor's team. At a minimum, the FPD needs to provide adequate oversight to understand the review methods used by the contractor to ensure a valid assessment was conducted. The FPD may request PMSO or OECM assistance.
- b. It is also a good business practice for a contractor to conduct a self-evaluation in preparation of a DOE-led Certification Review.
- c. In addition to providing the standard and basis by which an EVMS is to be certified, ANSI/EIA-748-B section 5.1 provides the following methods of self-evaluation that may be used as a basis for self certification. It is recommended that all methods be utilized:
 - (1) contractor's internal resources independent of the project team,
 - (2) a peer group from the contractor's internal resources and/or other organizations,
 - (3) an outside organization to assist with evaluation, and

- (4) associated DOE program representatives to assist with evaluation.
- d. Once a self-evaluation or self certification is completed, the FPD should formally notify the PMSO and OECM. OECM maintains the official record of certification status in PARS II.

6. DOE CERTIFYING AUTHORITY CERTIFICATION PROCESS

a. Points of Contact

The following points of contact (POCs) should be involved with the certification process.

- (1) DOE Certifying Authority should —
 - (a) Serve as primary certification POC.
 - (b) Develop the EVMS certification review schedule milestones by working with the contractor, FPD/site office, PMSO, and OECM, as applicable.
 - (c) Assemble, coordinate, and lead the review team.
 - (d) Ensure clear and transparent communication between all stakeholder POCs relative to the certification review. This includes the certifying authority, contractor, FPD/site office, and PMSO, as applicable.
- (2) Contractor POC should —
 - (a) Typically be manager or other member of the project controls department who is assigned responsibility for implementing and maintaining EVMS in accordance with the contract.
 - (b) Assess contract to determine if certification is required. If so, consults with the program/POC and the FPD/site office to schedule certification by appropriate certifying authority based on thresholds.
 - (c) Ensure that contractor has a mature EVMS supported by its project controls department as evidenced by self-evaluation.
- (3) PMSO POC should —
 - (a) Assess project CD status to determine if contractor requires DOE certification. If so, contact the certifying authority, in

consultation with the contractor and FPD/site office, to schedule certification with those projects planned to be provided as certification review documentation.

- (b) Assist in scheduling the contractor and FPD/site office resources to support the review efforts.
- (c) Assess contract status to determine if new contractor is anticipated. If so, contact the certifying authority, in consultation with the contractor and the FPD/site office, to determine if certification should be scheduled.

(4) FPD/Site Office should —

- (a) Assess project CD status to determine if contractor requires DOE certification. If so, contact appropriate PMSO and OECM, as applicable, in consultation with the contractor to schedule certification with those projects planned to be provided as certification review documentation.
- (b) Assess contract status to determine if new contractor is anticipated. If so, contact appropriate PMSO, in consultation with the contractor and other site office personnel, to determine if certification should be scheduled.

b. Milestones

This section provides a high-level overview of the potential major milestones of the DOE EVMS certification process.

- (1) M01—Readiness Assessment (RA)
- (2) M02—On-Site Review
- (3) M03—CAP Analysis & Acceptance
- (4) M04—CAP Implementation and Follow-Up Review
- (5) M05—Certification

c. M01—Readiness Assessment

- (1) The RA is an on-site meeting with the contractor to ensure that the contractor is ready for an EVMS certification review. It should be approximately one day or longer and scheduled two or more months prior to the on-site review. The contractor should have conducted some

form of self-evaluation prior to the RA. The on-site review may be postponed based on the RA or failure to address critical issues identified in the certifying authority's RA report.

- (2) The RA primarily consists of discussion of the general scope of the projects for which a review of the EVMS is conducted; the purpose, scope, and requirements of the certification review including DOE expectations; the on-site review process including required documents, interview schedule, timeframe for the on-site review, and all administrative support needed to conduct a quality review; and comments to certification review documentation provided by the contractor.
- (3) Deliverables
 - (a) Certification Review Documentation—the contractor should provide self-evaluation review documentation (APPENDIX E) approximately 30 working days prior to the RA.
 - (b) RA Report—the certifying authority should provide the contractor, PMSO, and FPD/site office with a report of the RA approximately 5 working days after the RA.

d. M02—On-Site Review

- (1) The on-site review with the contractor is to assess compliance with ANSI/EIA-748-B. Reviews typically take approximately 5 working days; however it is dependent upon the size, complexity, and number of projects.
- (2) The on-site review primarily consists of interviews by the DOE's on-site certification review team (APPENDIX F) of the contractor's control account managers (CAM), functional managers, project controls personnel, and senior managers and of data traces to determine if they support the certification review documentation.
- (3) At the end of the on-site review, the review team should provide an out-brief. The goal is to identify all findings. A finding is documented in the form of a corrective action request (CAR). Recommendations may be documented in the form of a continuous improvement opportunity (CIO).
 - (a) A CAR is a systemic or limited occurrence of an ANSI/EIA-748-B non-compliance or a significant impact to reporting, and requires a Corrective Action Plan (CAP).

- (b) A CIO is a recommended improvement or expansion of good practices for wider application and does not require a CAP.
- (4) It is critical for the contractor to inform the certifying authority, PMSO, and FPD/site office of any changes to the EVMS after the on-site in-brief.
- (5) Deliverables
 - (a) Certification Review Documentation—The contractor should provide certification review documentation (APPENDIX E) approximately 40 working days prior to the on-site review.
 - (b) Documentation of CARs and CIOs—The certifying authority should provide the contractor, PMSO, and FPD/site office the detailed write-ups (forms and attachments) for any CARs or CIOs within approximately five working days after the on-site out-brief.
 - (c) On-site Review Report—The certifying authority should provide the contractor, PMSO, and FPD/site office a report of the on-site review approximately ten working days after the on-site out-brief.
- e. M03—CAP Analysis and Acceptance
 - (1) The contractor prepares and submits a CAP for each CAR. A CAP represents the proposed action to address the CAR. A CAP clearly documents assumptions, constraints, and the commitment dates for (a) completion of corrective actions, and (b) submittal of any documentation of completion.
 - (2) If the certifying authority's CAP analysis concludes that the CAP logically outlines in sufficient detail the proposal to remedy the ANSI/EIA-748-B non-compliance or a significant impact to reporting, the CAP may be accepted.
 - (3) It may take more than one CAP submission before acceptance.
 - (4) The contractor is cautioned about implementing CAPs prior to DOE acceptance as they may result in the need for further changes and thereby be non-productive.
 - (5) Deliverables
 - (a) CAP—the contractor should provide the certifying authority the CAP for each CAR approximately 20 working days after the on-site review out-brief. If more time is needed due to the volume or complexity of the issues, the contractor should contact the

certifying authority, PMSO, and the FPD/site office to negotiate an extension.

- (b) CAP Acceptance—the certifying authority should respond to the contractor regarding the acceptability of the CAP approximately 10 working days after the receipt of the CAP.

f. M04—CAP Implementation and Follow-up Review

- (1) Based on the certifying authority's acceptance of the CAP, the contractor should proceed with implementation immediately. The EVMS description should also be updated as needed for any corrective actions.
- (2) Concurrently, evidence files (depending on the nature of the CARs, a minimum of 3 months of supporting documentation including CPRs) of the implementation that remedy the CAR should be sent to the certifying authority and the follow-up review should be coordinated among all stakeholders. Failure to provide sufficient evidence files within 5 months of CAP acceptance may result in a new certification review.
- (3) Upon receipt of all the evidence files, the certifying authority should conduct an assessment of corrective actions taken in preparation for CAR closeout or an on-site verification follow-up review if needed.
- (4) In cases where the evidence submitted does not allow for verification of CAR resolution, the certifying official will reject the evidence and provide notice to the contractor to resolve and resubmit.
- (5) Follow-up Review
 - (a) The follow-up review with the contractor is to verify corrective actions have been implemented. It typically is approximately a one to three day on-site review, or the certifying authority may substitute with a teleconference or video conference depending on the complexity and the number of CARs.
 - (b) The follow-up review primarily consists of review of the evidence packages, and may include interviews of the contractor's CAMs, functional managers, and senior managers to validate that the resolutions are implemented and assimilated into the project 'culture' and ongoing staff operations.
 - (c) A final certification report will document the closure of all open CARs and a successful certification. Should the follow-up review

show that some further action is required before the certification can be recommended, then subsequent reviews may be necessary.

(6) Deliverables

- (a) Evidence Files—the contractor should provide the certifying authority evidence files in accordance with the approved CAP. There should be a set of evidence files for each CAR.
- (b) Final Certification Report—the certifying authority should provide contractor, OECM, PMSO, and FPD/site office a final report approximately 20 working days after receipt of the evidence files.

g. M05—Certification

- (1) Upon successful completion of the certification review, the certifying authority provides the CO with a recommendation to formally accept the contractor's EVMS. The CO then notifies the contractor via a letter of certification.
- (2) It is expected that an EVMS should be ready for certification within six months of the on-site review. If the time between the on-site review and certification is longer than six months, then another on-site review may be necessary. In no case, should it extend beyond one year without restarting the certification process.
- (3) Deliverables
 - (a) Certification Review Notification Letter—the certifying authority will transmit the certification report via memorandum advising the CO that the contractor has successfully demonstrated EVMS compliance with the ANSI/EIA-748-B approximately 10 working days after the successful completion of the certification process.
 - (b) Letter of EVMS Certification—the CO provides the contractor a letter approving the contractor's EVMS as compliant with ANSI/EIA-748-B (or as contractually required) approximately 10 working days after recommendation from the certifying authority. The letter should address surveillance requirements specified in DOE O 413.3B, and direction to contractor to provide changes to the certified EVMS documentation to the certifying authority for review and recommended approval to the CO in accordance with FAR 52.234-4(e).

7. EVMS CERTIFICATION REPOSITORY

OECM is responsible for maintaining a repository of the status of all certifications, regardless of certifying authority and dollar thresholds, across DOE projects, sites, and contractors. Because a contractor may employ the same certified EVMS for multiple projects, it is essential that OECM maintain an accurate repository to ensure timely and accurate records. Additionally, OECM validates that the certification process is being accomplished in accordance with the DOE O 413.3B. The FPD is responsible for ensuring OECM receives copies of all self-certification reports. The PMSO, when acting as the certifying authority, provides copies of all deliverables and reports for each certification and surveillance to OECM when it is accomplished. The status of all certifications will be maintained by OECM in PARS II.

SECTION IV —SURVEILLANCE OF A CONTRACTOR’S EVMS

1. SURVEILLANCE OVERVIEW

Surveillance is the recurring process of reviewing a contractor’s EVMS to ensure continued compliance with ANSI/EIA-748-B and DOE policy. An effective surveillance process ensures that the key elements and the use of an EVMS are maintained over time and on subsequent applications (e.g., on new projects). The purpose of surveillance is to ensure that the contractor is continuing to use their EVMS effectively to monitor and manage cost, schedule, and technical performance.

The extent of the surveillance review may be tailored based on current conditions including assessment of the data and project risks. Surveillance reviews conducted by the PMSO or OECM may entail a review of how EVMS use is implemented by the contractor including how value is earned, recorded in applicable systems to include PARS II, and utilized to control the project. Through the process of surveillance, successful practices may be shared as part of the best practices process.

2. SURVEILLANCE TIMING

As stated in DOE Order 413.3B, self-surveillance is accomplished at least annually by the contractor. DOE surveillance is required as follows:

- a. Contract midpoint or every 2 years for multi-year contracts
- b. At contract extensions
- c. As requested by the AE
- d. Prior to CD-3 for Major System Projects where the contractor’s EVMS has been previously self-certified or PMSO-certified, OECM will conduct a surveillance to validate continued compliance.

3. EVMS SURVEILLANCE COORDINATION AND INTEGRATION

Effective EVMS surveillance involves all stakeholders to include OECM, PMSO, FPD, CO, and the contractor, working in an integrated, transparent manner.

- a. Contractor

The contractor has the primary responsibility for implementing and maintaining a surveillance program to ensure continued compliance of the system with ANSI/EIA-748-B. DOE O 413.3B requires the FPD to ensure the contractor conducts a self-surveillance annually. This annual self-surveillance, whether conducted as a single event or multiple events over the course of the year, should cover all 32 guidelines of the ANSI/EIA-748-B. Documentation of the self-surveillance is sent to the CO and the PMSO (copy to OECM) confirming the

continued compliance of their EVMS with ANSI/EIA-748-B, or as required by contract. ANSI/EIA-748-B states that the surveillance approach will be accomplished in accordance with the organization's policies. The policies associated with surveillance are reviewed as part of the DOE certification process. An acceptable approach to surveillance planning could begin with the establishment of a comprehensive surveillance plan prepared by the contractor and provided for information and comment to the PMSO and FPD/site office. The surveillance plan includes a clear definition of the scope of surveillance, the responsibilities, methods for conducting, and the schedule. The plan typically spans multiple years, is supplemented by an annual schedule with additional detail regarding the planned surveillances, and the projects selected for review. Responsibility for EVMS surveillance should be within an organization separate from the project manager's line management.

b. FPD/Site Office

To ensure EVMS requirements are included in the requirements package submitted to the CO, the FPD/Site Office is responsible for ensuring all applicable EVMS regulatory requirements, data item deliverables, and language relating to EVMS required by the various DOE Directives, orders and guides are included with or in the statement of work. A FPD/Site Office representative, designated as a Contracting Officer Representative (COR), provides the EVMS management oversight to include assessment, implementation, certification, surveillance, information to support contract award fee determinations and other mechanisms to ensure pay for performance, and reporting required in the contract to include compliance with FAR 42.15 for submitting contractor performance information as it may pertain to EVMS. It is incumbent upon the COR to work with the CO to ensure project needs are met and understood.

While the contractor has the primary responsibility for EVMS surveillance, FPD/site office also shares in the responsibility. The FPD/Site Office may conduct annual surveillances jointly with the contractor or in a manner that can verify (a) continued compliance with the certified EVMS, (b) that the certified EVMS has been properly implemented, and (c) that the data is timely, accurate, and being used to manage the project. If the DOE FPD/Site Office does not conduct joint surveillance, then they should assess the results of the contractor surveillance program to determine if additional DOE-led surveillances are necessary. To this end, in reviewing the results of the surveillances, DOE line management may decide to initiate site office directed surveillances or it may request that PMSO or OECM lead a surveillance review.

To confirm data accuracy, the FPD/Site Office conducts periodic physical verifications to ensure that the progress being reported is commensurate with actual progress being incurred, and that the actual costs are being reported. The DOE FPD/Site Office should also periodically verify that the data from the certified EVMS is accurately uploaded into PARS II.

When OECM or the PMSO leads a surveillance review, the FPD/Site Office support in accomplishing surveillance is essential. This support includes:

- (1) Keeping OECM and PMSO informed of actions and matters that could affect system surveillance
- (2) Assisting in the resolution of problems cited in either contractor and DOE surveillance reports
- (3) Reviewing, evaluating, and analyzing performance reports and schedules and bringing system or implementation concerns and data integrity issues to the attention of OECM and the PMSO.
- (4) Provide support to OECM or PMSO-led surveillance reviews
- (5) Participating as members of surveillance teams as requested. (Note that participation in reviews at other DOE sites can be an invaluable learning opportunity).

c. DOE PMSO

In addition to annual EVMS surveillance required to be conducted by the contractor and monitored by the FPD, the PMSO and OECM will conduct surveillances driven by the highest TPC in the contractor's portfolio. Use of the term "portfolio" is used to clarify that a contractor may have more than one project under the EVMS. The surveillance may include all EVMS-applicable projects based on risk, data analysis, and sampling. The determination of who leads the surveillance is determined by the TPC of the largest project in the portfolio. In accordance with DOE O 413.3B, the PMSO conducts surveillances of a contractor's EVMS when the contractor's portfolio includes a capital asset project with a TPC equal to or greater than \$50 but none greater than \$100M. The PMSO will provide OECM copies of all surveillance reports.

The PMSO may request OECM to lead or assist in conducting the surveillance. The PMSO will be requested to participate as a team member in surveillance activities conducted by OECM.

d. DOE OECM

OECM, in cooperation with DOE stakeholders, is responsible for the development and implementation of policies and uniform procedures defining the certification and surveillance process. OECM encourages the full participation and cooperation of all stakeholders. Therefore, all stakeholders may be asked to function as surveillance team members. Stakeholder participation is an essential ingredient to an effective and successful surveillance program. OECM will lead surveillance efforts in accordance with dollar thresholds provided in DOE O 413.3B. Many events, such as a request from the field or program office, negative performance

indicators, and OECM schedules can trigger reviews. This does not abrogate the responsibility of the contractor and DOE line management to establish their EVMS surveillance program. The DOE headquarters surveillance program is one of oversight.

Since the scope of EVMS surveillance focuses on continued compliance and implementation, the full contractor portfolio of capital asset projects at a single site where EVMS is applicable will be included in OECM-led surveillances. Coordination of surveillance activities with all stakeholders is vital to avoid duplication of effort, to minimize costs, to minimize disruption to the projects, and to increase communication. Where OECM is the designated surveillance lead either per DOE O 413.3B or per request of the PMSO, OECM will be responsible for the entire surveillance effort to include organizing, coordinating, and leading the surveillance team, defining the scope of the surveillance, closing any CARs, documenting the results, and informing the CO. During the execution of the surveillance efforts, OECM will maintain coordination with FPD/Site Office and PMSO(s) involved with the contractor under review.

OECM will provide support to the PMSO-led surveillance on contracts with a portfolio of projects with a TPC equal to or greater than \$50M but less than \$100M. Upon PMSO request or if the PMSO does not conduct the surveillance, OECM will lead the surveillance.

e. Contracting Officer

The DOE CO is responsible to incorporate the EVMS requirements as provided by the program/project office, into the solicitation and contract along with the appropriate FAR clauses. The CO ensures that contractor performance is integrated with the contract award fee determinations and other mechanisms to ensure pay for performance including the assessment of EVMS implementation, certification, reporting, and project performance by the COR. It is incumbent upon the CO, COR, OECM, PMSO, and the FPD(s) to work together to ensure project needs are met and understood.

Following closeout of HQ surveillance activities, OECM or the PMSO will provide a letter to the CO either affirming continued compliance or failure to maintain compliance of the contractor's system. Should a contractor fail to maintain its EVMS system, the CO may withdraw the EVMS certification and elect to seek contractual remedies.

4. DOE SURVEILLANCE CONCEPT

The DOE surveillance process differs from the certification process in that the certification review includes all guidelines from both a procedural and implementation perspective, and a portion of the review is conducted on site to observe integration of tools, conduct interviews, and interact with users. The DOE surveillance process will normally focus on areas identified as a result of risk and data analysis. Surveillance may

be routine or situational as in an Implementation Review or RFC depending on the circumstances described in Section III, 2. d-f. Regardless of the purpose of review, i.e. routine surveillance, implementation, or RFC, the basic process of risk evaluation and data analysis is the same. The difference is that the scope, depth, and rigor may be tailored to suit the situation prompting the review. Best practice process related examples are provided at <http://energy.gov/management/office-management/operational-management/project-management/earned-value-management>.

A recommended approach for EVMS surveillance is to conduct risk based, data driven continual surveillance. This may be done by conducting a risk assessment to identify areas of EVMS risk in each project, reviewing and analyzing EV data, and other artifacts including reports from recent project reviews. If the data or risk warrants a deeper look, then a desk audit may be conducted to gain more insight to include interviews with contractor and FPD staff, and review of additional supporting data requested from the contractor. Should areas of concern arise that cannot be sufficiently addressed off site, then an on-site review team may be assembled to focus on those remaining areas of concern. Figure IV-1 provides a graphical representation of the surveillance decision process.

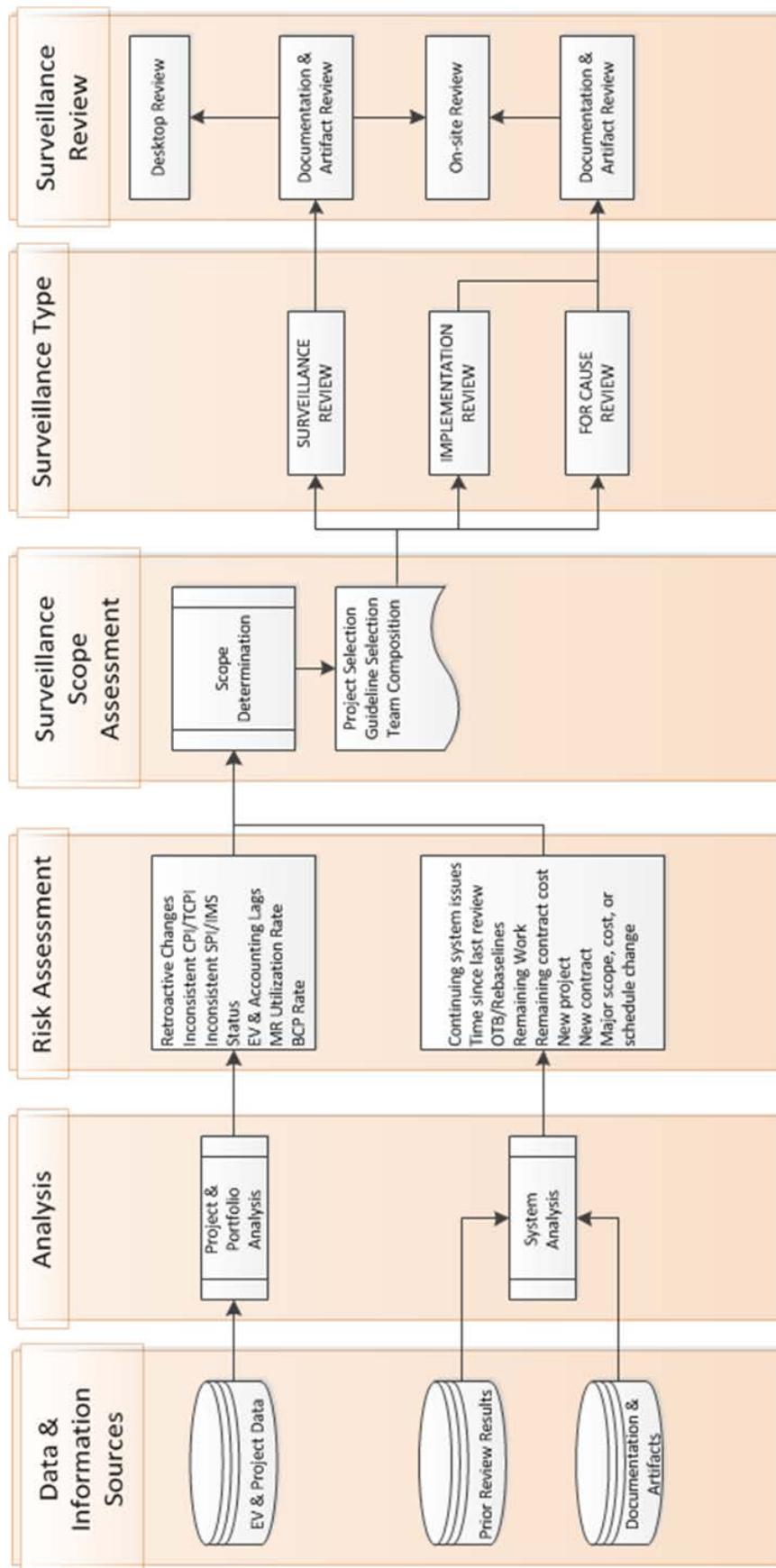


Figure IV-1. Surveillance Process Overview

5. DOE SURVEILLANCE PROCESS

a. EVMS Risk Assessment

The surveillance process begins with a risk assessment of the certified EVMS. An industry and government best practice is the application of a risk matrix. [APPENDIX H](#) identifies common elements that should be included in the risk assessment of the EVMS. An EVMS risk matrix modified for use in DOE is included at <http://energy.gov/management/office-management/operational-management/project-management/earned-value-management>. An initial risk assessment should be conducted following certification. At a minimum, the risk assessment should be updated at each major project event or milestone, but no less than semiannually. The risk assessment should encompass each major risk area. The culmination of a risk assessment is a determination of the necessity and scope of further surveillance given the identified risks. The risk assessment could be the only surveillance necessary or could culminate in an on-site surveillance review to assess the full scope of ANSI/EIA-748-B.

b. Surveillance Scope

The risk assessment is employed to determine the scope and nature of the review. The scope may consist of just a few control accounts where the risk assessment identified the greatest cost and schedule risks or the greatest to-go cost. The risk assessment may identify multiple projects where project performance indicates that the system has not been institutionalized with the project management organization. The assessment may also indicate that an on-site review is necessary to consult directly with Control Account Managers and other project staff to determine whether the system continues to comply with ANSI/EIA-748-B.

The minimum surveillance scope will be an off-site review of available project and project performance information. Other artifacts may be requested depending on the nature and scope of the review. Telephone or VTC may be used to conduct interviews of key personnel.

c. Surveillance Review Scheduling

Surveillance review scheduling is influenced by the length of time since the last surveillance or certification review and the risk factors determined during the risk assessment process. Schedules will be adjusted to align with project events or other project reviews to ensure that project staffs are available to support the review depending on the scope of the review. All stakeholders are urged to share and coordinate scheduled reviews to avoid duplication. For example, should a Project Peer Review, FPD/Contractor annual EVMS review, or something similar be on the planning horizon, the PMSO or OECM-led EVMS surveillance team should consider combining efforts to avoid duplication and excessive data calls.

d. Team Composition

The size and composition of the team conducting the review is governed by the size and complexity of the project, the scope of the review, and whether the review is being conducted on-site or remotely. In all cases, the review team should include project analysts who are responsible for conducting routine oversight of the project and the contractor.

Because EVM requires interface with the procurement and accounting systems, appropriate staff should be included when these areas are subject to examination during a review. For contractors required to annually certify compliance with the Cost Accounting Standards, evidence of this compliance should be obtained from the CO responsible for reviewing and ensuring compliance.

[APPENDIX F](#) provides information on team composition for an on-site certification review. This appendix can be used as a point of departure when forming a team for a surveillance review. Typically, the surveillance team will be significantly smaller than shown in the appendix. However, the principle remains the same in that multiple, cross-cutting sub teams are employed to encompass all the process areas to the extent necessary to meet necessary scope of the surveillance review.

e. Artifacts and Information

The artifacts and information employed in surveillance are identical to those used for a certification review. Artifacts are dynamic information that results from operation of the EVMS. These include logs, change requests, reports, and other information containing data. Artifacts can be contrasted with information that is primarily static documentation, such as process and system descriptions. Artifacts for surveillance will contain more information than those required for certification, such as performance data, logs, and other artifacts that were produced as a result of the system operation and project progress. [APPENDIX E](#) contains the list of typical artifacts and information used in reviews.

The specific artifacts and information that are necessary for surveillance depend on the scope of the surveillance review, which is an outcome of the risk assessment process. Determining the availability of the artifacts and information is in itself a form of surveillance. For example, the inability to readily produce a Management Reserve Utilization Log or similar artifact is an indicator that the system is not functioning as originally reviewed and certified.

6. CONDUCT OF SURVEILLANCE

Surveillance is conducted in a manner that facilitates answering four fundamental questions.

- Does the system comply with ANSI/EIA-748-B?

- Is the system being used to manage the project?
- Is the data accurate, timely and reliable?
- Does the data represent the entire scope?

The review involves examining artifacts such as logs, change requests, and budget reconciliation documents to ensure that the system is operating as designed and described in the system description. System utilization is primarily evidenced through the explanation provided for the data and the subsequent managerial decisions in response to the data.

Determination of accuracy, timeliness and reliability requires examination of the data to ensure that it represents true project performance. This is evidenced through the examination of trends, which correspond to project events.

The validity of the PMB and maintenance of baseline integrity are key objectives of surveillance and are primarily achieved through the examination of budgets, baseline change proposals (BCPs), reconciliations, and other data to ensure that all costs are reflected in the PMB and that all costs are related to defined scope as identified in the Integrated Master Schedule.

a. Documenting Surveillance Results

Regardless of the scope of the surveillance and method of accomplishment, all surveillance reviews should be documented in a similar manner to facilitate understanding and provide opportunities for continuous improvement of the process and lessons learned for surveillance and for EVM implementation on projects. The criteria for identifying CARs and CIOs are identical to the certification process. OEM, PMSO, and FPD/site office should be on distribution for all surveillance reports, including contractor self-surveillance, regardless of who was the certifying authority.

b. System Surveillance Report Format

The system surveillance report should include the following items.

- Contractor Identification
- Site
- Subcontractors
- Site Name
- Project(s)

- Surveillance Selection Risk Matrix(s);
- Guidelines and Process(es) reviewed;
- PM and CAM(s) interviewed and control accounts examined;
- System deficiencies identified
 - Corrective Action Request(s)
 - Supplier Corrective Action Plan in place
 - Actions taken to correct the deficiency
 - Analysis of trends and systemic issues
- Best Practices Identified

c. Corrective Action Processing and Tracking

CAPs are required for all CARs and processing of CAPs is identical to the certification process.

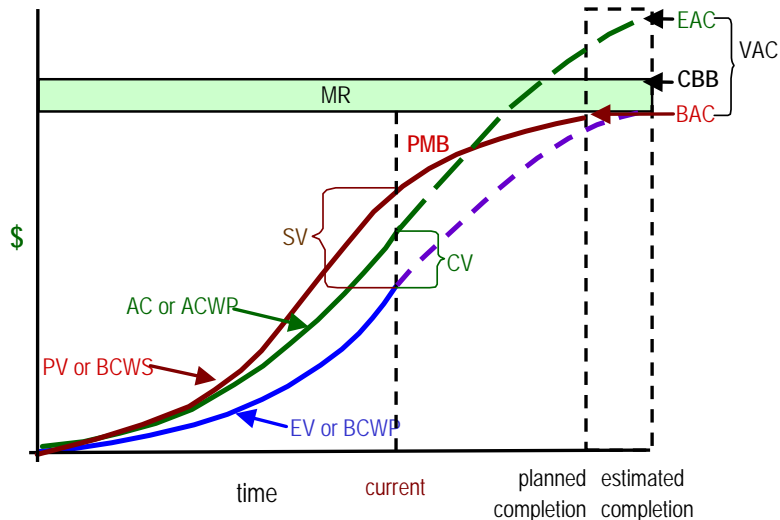
d. Surveillance Report Transmittal

Following closure of CARs in the CAP, the certifying authority will transmit the surveillance report via memorandum to the CO of successful resolution of the surveillance and continued compliance with ANSI/EIA-748-B. The CO will issue formal notification to the contractor.

APPENDIX A—REFERENCES

- ANSI/EIA-748-B-2007, *Earned Value Management Systems*, 2007, <http://ansi.org/>.
- DoD EVMS website, <http://www.acq.osd.mil/evm/>.
- DoD DI-MGMT-81466A, *Contract Performance Report*,
http://www.assistdocs.com/search/document_details.cfm?ident_number=206421&StartRow=1&PaginatorPageNumber=1&doc%5Fid=DI%2DMGMT%2D81466A&status%5Fall=ON&search%5Fmethod=BASIC.
- DOE O 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, dated 11-29-2010, <http://energy.gov/management/office-management/operational-management/project-management/policy-and-guidance>.
- DOE 413.3 series guides.
- FAR Subparts 34.2 and 52.234, *Earned Value Management System*, 2008,
www.acquisition.gov/far/index.html – Provides EVMS and certification requirements and solicitation provisions and contract clauses for acquisitions.
- GAO-09-3SP, *GAO Cost Estimating and Assessment Guide – Best Practices for Developing and Managing Capital Program Costs*, March 2009, <http://www.gao.gov/products/GAO-09-3SP>.
- NDIA Program Management Systems Committee (PMSC) for access to numerous guides, white papers, and information relating to industry best practices and EVMS,
http://www.ndia.org/Divisions/Divisions/Procurement/Pages/Program_Management_Systems_Committee.aspx.
 - NDIA PMSC, *Earned Value Management Systems Application Guide*, 2011,
http://www.ndia.org/Divisions/Divisions/Procurement/Pages/Program_Management_Systems_Committee.aspx
 - NDIA PMSC, *Earned Value Management Systems Intent Guide*, 2006,
http://www.ndia.org/Divisions/Divisions/Procurement/Pages/Program_Management_Systems_Committee.aspx
 - NDIA PMSC, *Surveillance Guide*, 2011,
http://www.ndia.org/Divisions/Divisions/Procurement/Pages/Program_Management_Systems_Committee.aspx
- OMB Circular A-11, *Part 7, Planning, Budgeting, Acquisition, and Management of Capital Assets*, includes supplement, *Capital Planning Guide*, 2007,
http://www.whitehouse.gov/omb/circulars/a11/current_year/a11_toc.html.
- Project Assessment and Reporting System II (PARSII),
<http://energy.gov/management/project-assessment-and-reporting-system-pars-ii/>.

APPENDIX B —DOE EVMS GOLD CARD



PERFORMANCE BASELINE COMPONENTS

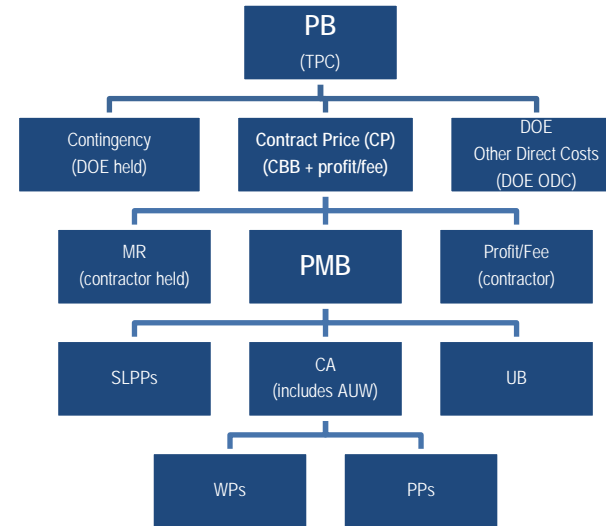
(Performance Baseline must clearly document scope/KPPs, TPC and CD-4 date)

- AUW = Authorized Unpriced Work (contractually approved, but not yet negotiated)
- CA = Control Account (includes AUW) = WPs + PPs
- CBB = Contract Budget Base = PMB + MR
- CP = Contract Price = CBB + profit/fee
- MR = Management Reserve is held by contractor (Contingency is held by DOE)
- PB = Performance Baseline (TPC) = CP + Contingency + DOE ODC
- PMB = Performance Measurement Baseline = CAs + UB + SLPPs
- PP = Planning Package (far-term activities within a CA)
- SLPP = Summary Level Planning Package
- UB = Undistributed Budget (activities not yet distributed to CA)
- WP = Work Package (near-term, detail-planned activities within a CA)

EVMS BASIC COMPONENTS*

- AC = Actual Cost = ACWP = Actual Cost of Work Performed
- EV = Earned Value = BCWP = Budgeted Cost of Work Performed
- PV = Planned Value = BCWS = Budgeted Cost of Work Scheduled
- BAC = Budget at Completion = $\sum BCWS$ = Sum of Budgeted Cost of Work Scheduled

* For analysis purposes, AC, EV and PV calculations may be based on various time periods, e.g., monthly, cumulative, last 3 months from CD-2 or BCP or internal replan.



VARIANCES*

- CV = EV - AC = BCWP - ACWP = Cost Variance
- SV = EV - PV = BCWP - BCWS = Schedule Variance
- CV% = (EV - AC) / EV = (BCWP - ACWP) / BCWP = Cost Variance (%)
- SV% = (EV - PV) / PV = (BCWP - BCWS) / BCWS = Schedule Variance (%)
- VAC = BAC - EAC = Variance at Completion

OVERALL STATUS

- % scheduled = PV_{cum} / BAC = $BCWS_{cum} / BAC$
- % complete = EV_{cum} / BAC = $BCWP_{cum} / BAC$
- % budget spent = AC_{cum} / BAC = $ACWP_{cum} / BAC$
- Work Remaining (WR) = $BAC - EV_{cum}$ = $BAC - BCWP_{cum}$

PERFORMANCE INDICES*

- CPI = EV / AC = BCWP / ACWP = Cost Performance Index
- SPI = EV / PV = BCWP / BCWS = Schedule Performance Index
- TCPI_{BAC} = $WR / (BAC - ACWP_{cum})$ = BAC-based To Complete Performance Index
- TCPI_{EAC} = $WR / (EAC - ACWP_{cum})$ = EAC-based To Complete Performance Index

COMPLETION ESTIMATES

- EAC = BAC / CPI_{cum} = Estimate at Completion (general)
- EAC_{CPI} = $AC_{cum} + WR / CPI_{cum}$ = Estimate at Completion (CPI)
- EAC_{composite} = $AC_{cum} + WR / (CPI_{cum} \cdot SPI_{cum})$ = Estimate at Completion (composite)
- ETC = $EAC - AC_{cum}$ = Estimated to Complete

APPENDIX C —CPR FORMATS 1 TO 5 OVERVIEW

1. The following CPR formats are available from the Department of Defense website (APPENDIX A). Blank forms are attached on the following pages.
 - a. Format 1: WBS

Provides data to measure cost and schedule performance by product-oriented work breakdown structure (WBS) elements, the hardware, software, and services the Government is buying. Identifies any reprogramming adjustment, BAC, EAC, MR, UB, and variance at completion by element. It can also show the indirect costs by element.
 - b. Format 2: Organizational Categories

Provides format 1 data by the contractor's organization (functional or integrated product team structure). Refers to the organizational categories that reflect the contractor's internal management. A certified EVMS requires reporting by WBS and organizational breakdown structure (OBS).
 - c. Format 3: Baseline

Provides the time-phased budget baseline plan against which performance is measured by showing changes from last reporting period to current period.
 - d. Format 4: Staffing

Provides staffing forecasts for correlation with the budget plan and cost estimates.
 - e. Format 5: Explanation and Problem Analyses

A narrative report used to explain significant cost and schedule variances and other identified contract problems and topics to the CA level.
2. Regarding completion of the data blocks in CPR formats 1 to 5, many of the blocks are self-explanatory. Sample descriptions of some that may not be so clear are provided below, and detailed instructions for completing the CPR data blocks can be obtained from the DoD website (APPENDIX A).
 - a. Phase: Refers to current segment of a project (e.g., design, construction, commissioning).
 - b. Share Ratio: Refers to contracts wherein there is a sharing of costs, or cost savings, for completion of the project above, or below, a contractually established target cost. For example, if for every dollar that the project is completed less than the target cost the DOE retains 80 cents and the contractor's fee is increased by 20 cents, then the share ratio would be 80/20.

- c. Cost of Money: Refers to interest costs incurred by the contractor when financing facility capital assets (e.g., the building, equipment procurements, etc). This usually is not done for DOE projects (and is usually not applicable).

3. CPR FORMATS 1 TO 5

CLASSIFICATION (When filled in)																								
CONTRACT PERFORMANCE REPORT FORMAT 1 - WORK BREAKDOWN STRUCTURE																								
DOLLARS IN _____																								
Form Approved OMB No. 0704-0188																								
The public reporting burden for this collection of information is estimated to average 3.1 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION. SUBMIT COMPLETED FORMS IN ACCORDANCE WITH CONTRACTUAL REQUIREMENTS.																								
1. CONTRACTOR		2. CONTRACT		3. PROGRAM			4. REPORT PERIOD																	
a. NAME		a. NAME		a. NAME			a. FROM (YYYYMMDD)																	
b. LOCATION (Address and ZIP Code)		b. NUMBER		b. PHASE			b. TO (YYYYMMDD)																	
c. TYPE		d. SHARE RATIO		c. EVMS ACCEPTANCE			YES (YYYYMMDD)																	
5. CONTRACT DATA		a. QUANTITY		b. NEGOTIATED COST		c. EST. COST AUTHORIZED UNPRICED WORK		d. TARGET PROFIT/ FEE		e. TARGET PRICE		f. ESTIMATED PRICE		g. CONTRACT CEILING		h. EST. CONTRACT CEILING		i. DATE OF OTB/OTS (YYYYMMDD)						
6. ESTIMATED COST AT COMPLETION		MANAGEMENT ESTIMATE AT COMPLETION (1)		CONTRACT BUDGET BASE (2)		VARIANCE (3)		7. AUTHORIZED CONTRACTOR REPRESENTATIVE		a. NAME (Last, First, Middle Initial)		b. TITLE		c. SIGNATURE		d. DATE SIGNED (YYYYMMDD)								
a. BEST CASE																								
b. WORST CASE																								
c. MOST LIKELY																								
8. PERFORMANCE DATA																								
ITEM (1)		BUDGETED COST		ACTUAL COST		BUDGETED COST		ACTUAL COST		BUDGETED COST		ACTUAL COST		BUDGETED COST		ACTUAL COST		BUDGETED COST						
		WORK SCHEDULED (2)		WORK PERFORMED (3)		WORK SCHEDULED (4)		WORK PERFORMED (5)		WORK SCHEDULED (6)		WORK PERFORMED (7)		WORK SCHEDULED (8)		WORK PERFORMED (9)		BUDGET (10)						
a. WORK BREAKDOWN STRUCTURE ELEMENT																								
b. COST OF MONEY																								
c. GENERAL & ADMINISTRATIVE																								
d. UNDISTRIBUTED BUDGET																								
e. SUBTOTAL (Performance Measurement Baseline)		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00						
f. MANAGEMENT RESERVE																								
g. TOTAL		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00						
9. RECONCILIATION TO CONTRACT BUDGET BASE																								
a. VARIANCE ADJUSTMENT																								
b. TOTAL CONTRACT VARIANCE																								
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CONTRACT PERFORMANCE REPORT FORMAT 2 - ORGANIZATIONAL CATEGORIES															DOLLARS IN _____		
<small>The public reporting burden for this collection of information is estimated to average .6 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</small> DD FORM 2734/2, APR 2005																	
1. CONTRACTOR																	
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3. PROGRAM																	
4. REPORT PERIOD																	
5. PERFORMANCE DATA																	
6. REPROGRAMMING ADJUSTMENTS																	
7. AT COMPLETION																	
8. SUMMARY																	
9. TOTAL																	
10. MANAGEMENT RESERVE																	
11. SUBTOTAL (Performance Measurement Baseline)																	
12. UNDISTRIBUTED BUDGET																	
13. GENERAL & ADMINISTRATIVE																	
14. COST OF MONEY																	
15. ORGANIZATIONAL CATEGORY																	
16. LOCATION (Address and ZIP Code)																	
17. TYPE																	
18. EVMS ACCEPTANCE																	
19. SHARE RATIO																	
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CONTRACT PERFORMANCE REPORT FORMAT 3 - BASELINE												DOLLARS IN					
<small>The public reporting burden for this collection of information is estimated to average 6.3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</small>																	
PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION. SUBMIT COMPLETED FORMS IN ACCORDANCE WITH CONTRACTUAL REQUIREMENTS.																	
1. CONTRACTOR		2. CONTRACT		3. PROGRAM		4. REPORT PERIOD											
a. NAME		a. NAME		a. NAME		a. FROM (YYYYMMDD)											
b. LOCATION (Address and ZIP Code)		b. NUMBER		b. PHASE		b. TO (YYYYMMDD)											
c. TYPE		d. SHARE RATIO		c. EVMS ACCEPTANCE													
				NO		YES (YYYYMMDD)											
5. CONTRACT DATA																	
a. ORIGINAL NEGOTIATED COST		b. NEGOTIATED CONTRACT CHANGES		c. CURRENT NEGOTIATED COST (a. + b.)		d. ESTIMATED COST OF AUTHORIZED UNPRICED WORK		e. CONTRACT BUDGET BASE (c. + d.)		f. TOTAL ALLOCATED BUDGET		g. DIFFERENCE (e. - f.)					
0.00		0.00		0.00		0.00		0.00		0.00		0.00					
h. CONTRACT START DATE (YYYYMMDD)		i. CONTRACT DEFINITIZATION DATE (YYYYMMDD)		j. PLANNED COMPLETION DATE (YYYYMMDD)		k. CONTRACT COMPLETION DATE (YYYYMMDD)		l. ESTIMATED COMPLETION DATE (YYYYMMDD)									
6. PERFORMANCE DATA																	
ITEM		BCWS CUMULATIVE TO DATE (2)		BCWS FOR REPORT PERIOD (3)		BUDGETED COST FOR WORK SCHEDULED (BCWS) (Non-Cumulative)								UNDISBURSED BUDGET (15)		TOTAL BUDGET (16)	
						ENTER SPECIFIED PERIODS											
						SIX MONTH FORECAST (Enter names of months)											
						+1 +2 +3 +4 +5 +6											
						(4) (5) (6) (7) (8) (9)											
(1)																	
a. PERFORMANCE MEASUREMENT BASELINE (Beginning of Period)																	
b. BASELINE CHANGES AUTHORIZED DURING REPORT PERIOD																	
c. PERFORMANCE MEASUREMENT BASELINE (End of Period)																0.00	
7. MANAGEMENT RESERVE																	
8. TOTAL																0.00	
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CONTRACT PERFORMANCE REPORT FORMAT 4 - STAFFING													Form Approved OMB No. 0704-0188	
The public reporting burden for this collection of information is estimated to average 5.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION. SUBMIT COMPLETED FORMS IN ACCORDANCE WITH CONTRACTUAL REQUIREMENTS.														
1. CONTRACTOR			2. CONTRACT			3. PROGRAM			4. REPORT PERIOD					
a. NAME			a. NAME			a. FROM (YYYYMMDD)								
b. LOCATION (Address and Zip Code)			b. NUMBER			b. PHASE			b. TO (YYYYMMDD)					
c. TYPE			d. SHARE RATIO			c. EVMS ACCEPTANCE								
						NO			YES (YYYYMMDD)					
5. PERFORMANCE DATA (All figures in whole numbers)														
ORGANIZATIONAL CATEGORY	ACTUAL CURRENT PERIOD (2)	ACTUAL END OF CURRENT PERIOD (Cumulative) (3)	SIX MONTH FORECAST BY MONTH (Enter names of months)						FORECAST (Non-Cumulative)			AT COMPLETION (15)		
			+ 1 (4)	+ 2 (5)	+ 3 (6)	+ 4 (7)	+ 5 (8)	+ 6 (9)	(10)	(11)	(12)		(13)	(14)
(1)														
6. TOTAL DIRECT	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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CONTRACT PERFORMANCE REPORT
FORMAT 5 - EXPLANATIONS AND PROBLEM ANALYSES

Form Approved
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 36.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.
PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION. SUBMIT COMPLETED FORMS IN ACCORDANCE WITH CONTRACTUAL REQUIREMENTS.

1. CONTRACTOR		2. CONTRACT		3. PROGRAM		4. REPORT PERIOD	
a. NAME		a. NAME		a. NAME		a. FROM (YYYYMMDD)	
b. LOCATION (Address and ZIP Code)		b. NUMBER		b. PHASE		b. TO (YYYYMMDD)	
c. TYPE		d. SHARE RATIO		c. EVMS ACCEPTANCE			
				NO		YES (YYYYMMDD)	

5. EVALUATION

Discussion should include but is not limited to:

Summary Analysis:

- Summary of Overall Contract Variances
- Differences between EAC's (Blocks 6.a., 6.b., 6.c., or Block 8.15)
- Changes in Undistributed Budget
- Changes in Management Reserve
- Significant timephasing shifts in Baseline (BCWS) (Format 3)
- Significant timephasing shifts or overall changes in Forecasted Staffing (Format 4)
- Discussion of Over Target Baseline and/or Over Target Schedule Incorporation

Analysis of Significant Variances (identify and describe each):

- Type and Magnitude of Variance
- Explanation of Significant Reasons
- Effect on Immediate Task
- Effect on Total Contract
- Corrective Actions Taken or Planned

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APPENDIX D—CPR FORMATS 1 TO 5 CHECKLIST

The following are some checks for CPR formats 1 to 5 noted in APPENDIX C.

1. FORMAT 1: WBS

- a. Check Summary information for correctness (i.e., contract number/type, program name, report period, and signature).
- b. Verify negotiated cost tracks to the latest definitized contractual actions.
REMEMBER: Cost does not include fee. Ensure that the estimated cost of authorized unpriced work (AUW) reflects contractual actions in progress and not definitized (e.g., change orders, not-to-exceeds, supplemental agreements, and letter contracts).
- c. Check and verify the following:
 - (1) *Fixed Fee* should reconcile to the fixed fee definitized on contract.
 - (2) *Award Fee Pool* should reconcile to the total definitized award fee negotiated on contract.
 - (3) *Award Fee* earned should reflect the fee the contractor earned to date. Crosscheck with the contract.
 - (4) *Award Fee available* should reflect the award fee pool less award fee earned less unearned award fee.
- d. Check and verify that the:
 - (1) $Negotiated\ Price = Negotiated\ cost + Fixed\ fee + Award\ fee\ earned + Award\ fee\ available$
 - (2) $Estimated\ Price = Negotiated\ price + Estimated\ cost\ of\ authorized\ unpriced\ work$
- e. Assess changes to the UB that should be explained in Format 3, and efforts should be made to distribute all UBs well ahead of the planned execution of the work. Look for significant changes in the MR budget. Significant changes in budget should be identified in format 3 and explained in format 5. Any entry in the MR EAC represents MR usage.

2. FORMAT 2: ORGANIZATIONAL CATEGORIES

Verify information against organizational categories.

3. FORMAT 3: BASELINE

- a. Check and verify header information. Cross-check with format 1.
- b. Note changes to PMB since the last report. Reconcile the end of month PMB BCWS to the BCWS “total” line of format 1.

4. FORMAT 4: STAFFING

Check accuracy of headcount data with control account managers (CAM)/integrated project team (IPT) leads. Note changes in headcount since the last report. Look for major changes, i.e., significant shifts in time-phasing of planned staffing in projected headcount (rule of thumb, >10%). Reconcile the headcount with format 3 data. Check for explanation in the format 5.

5. FORMAT 5: EXPLANATION AND PROBLEM ANALYSES

- a. Refer to SECTION II for a discussion of what the variances and indices may be indicating regarding over-all performance, the reasons for the variances, the adequacy of corrective action plans, and forecasts of future performance.
- b. Also check whether the indicated reasons for variances are within (or outside) the listing of identified risks, and whether proper re-planning of future work has been done to better plan future work, and whether contractor MR is being properly utilized.

APPENDIX E—TYPICAL CERTIFICATION REVIEW DOCUMENTATION

1. READINESS ASSESSMENT

Typical certification review documentation to be provided to OECM approximately 30 working days prior to the RA:

- a. primary POCs,
- b. contract with changes/modifications,
- c. list of subcontractors with associated scopes of work,
- d. EVMS description, surveillance plan, and change control procedure and other implementing procedures (i.e., referenced documentation),
- e. cross reference of the EVMS description to ANSI/EIA-748-B guidelines (compliance map),
- f. WBS and WBS dictionary,
- g. organizational chart and OBS, and
- h. dollarized responsibility assignment matrix (RAM).

2. ON-SITE REVIEW

Typical certification review documentation to be provided to OECM approximately 40 working days prior to the on-site review:

- a. updated documentation including those listed above and already provided,
- b. contract performance reports (CPR) for the last 3 consecutive months,
- c. CAM notebooks (representative sample),
 - (1) CA plans (representative sample of contractor's and subcontractor's),
 - (2) CA schedules (contractor's and subcontractor's),
 - (3) variance analysis reports (representative sample),
- d. variance analysis corrective action log,
- e. project schedule (in native format)
- f. change control log including executed and pending,

- g. management reserve and contingency log,
- h. UB log,
- i. accounting policies and procedures,
- j. rationale for projected rates,
- k. disclosure statement, and
- l. Defense Contract Audit Agency (DCAA), Inspector General (IG), or other audit reports.

APPENDIX F—OECM ON-SITE CERTIFICATION REVIEW TEAM

1. TYPICAL REVIEW TEAM

A typical EVMS onsite certification review team led by OECM is shown in Table 1 and is presented as a best practice for others to follow.

Table 1 – Typical OECM Onsite Certification Review and Interview Team Matrix

4 Functional Teams			4 Interview Teams			
No.	5 Functional Areas	Member	1	2	3	4 (Accounting)
A	Organization	Member A1	x			
		Member A2		x		
	Analysis and Management Reports	Member A3			x	
B	Planning and Budgeting	Member B1		x		
		Member B2	x			
		Member B3			x	
C	Accounting	Member C1				x
		Member C2				x
		Member C3				x
D	Revisions	Member D1			x	
		Member D2	x			
		Member D3		x		

The 5 functional areas shown represent the 5 process groupings into which the 32 ANSI/EIA-748-B guidelines are categorized. A functional area lead is designated for each functional area. Each functional team member is assigned to an interview team, wherein the interview teams are constructed to have representation from all but team 4, the accounting team. The accounting team also conducts interviews, and although it is assigned to a few of the interviews conducted by the other three interview teams, in large part it conducts its interviews of accounting personnel. In addition to the interviews of the contractor personnel conducted by the 4 interview teams, the OECM EVMS lead with other team members conduct interviews of the contractor's senior management.

2. FUNCTIONING OF THE REVIEW TEAM

a. In general, the review team plans and executes its work prior to, during, and following the onsite review, as follows:

- (1) Prior to the onsite review, team members review the certification review documentation that is supplied by the OECM EVMS lead to assess

compliance of the EVMS processes and procedures with ANSI/EIA-748-B.

- (2) During the onsite review, team members conduct interviews and data traces to determine if contractor personnel are doing business consistent with their EVMS procedures. Also, at the end of each day the entire team assembles to discuss potential problem issues. Further, the OECM EVMS lead with other team members meet at the end of each day of interviews with the contractor in order to ensure that there are no misunderstandings in what the review team believes it is observing and to ensure there are no surprises at the onsite review out-brief.
 - (3) Following the onsite review and acceptance of the contractor's CAP, the OECM EVMS lead and necessary functional team leads assess the acceptability of the contractor CAP and support further reviews to ensure successful CAP implementation.
- b. Technical accountability (e.g., determining which issues represent noncompliances with ANSI/EIA-748-B) rests with OECM; however, in most cases a consensus position is usually reached by the entire review team.
- c. Staffing of the Review Team
- (1) In general, the accounting team is comprised primarily of personnel from the program that has accounting oversight responsibility for the contractor being reviewed. This is usually a DOE field services office or DCAA.
 - (2) The remaining review team members should be qualified personnel from within DOE and may include other DOE contractor personnel who have no conflict of interest with the contractor being reviewed. The OECM EVMS lead will begin coordination with the PMSO EVMS focal point to identify the review team members approximately 45 working days prior to the start of the on-site review.
 - (3) Staffing of the review team should be identified by approximately 20 working days prior to the start of the on-site review.

APPENDIX G—ACRONYMS

AC	actual cost
ACWP	actual cost of work performed
ANSI	American National Standards Institute
AUW	authorized unpriced work
BAC	budget at completion
BCP	baseline change proposal
BCWP	budgeted cost for work performed
BCWR	budgeted cost of work remaining
BCWS	budgeted cost for work scheduled
CA	control account
CAM	control account manager
CAP	corrective action plan
CAR	corrective action request
CBB	contract budget base
CD	critical decision
CFSR	contract funds status report
CIO	continuous improvement opportunity
CPI	cost performance index
CPR	contract performance report
cum	cumulative
CV	cost variance
CPR	contract performance report
DCAA	Defense Contract Audit Agency
DoD	Department of Defense
DOE	Department of Energy
EAC	estimate at completion
ETC	estimate to complete
EIA	Electronic Industries Alliance
EIR	external independent review
EV	earned value
EVMS	earned value management system
FAR	Federal Acquisition Regulation
FPD	federal project director
FPRA	forward pricing rate agreement
G	guide
GAO	Government Accountability Office

IG	Inspector General
IPR	independent project review
IPT	integrated project team
LRE	latest revised estimate (at completion)
M	million or milestone
MR	management reserve
NDIA	National Defense Industrial Assoc
O	order
OBS	organizational breakdown structure
OECM	Office of Engineering and Construction Management
OMB	Office of Management and Budget
OTB	over target baseline
PARS II	Project Assessment and Reporting System II
PB	performance baseline
PEP	project execution plan
PMB	performance measurement baseline
PMSC	Program Management Systems Committee
PMSO	Project Management Support Office
POC	point of contact
PP	planning package
PSO	Program Secretarial Officer
PV	planned value
RA	readiness assessment
RAM	responsibility assignment matrix
RFC	review for cause
SLPP	summary level planning package
SPI	schedule performance index
SV	schedule variance
TCPI	to complete performance index
TPC	total project cost
UB	undistributed budget
VAC	variance at completion
WBS	work breakdown structure

APPENDIX H—EVMS RISK ASSESSMENT ELEMENTS

RISK	HIGH	MEDIUM	LOW
PROJECT PHASE	PRIOR to CD-3: Organizing, Scheduling, Work/Budget Authorization	POST CD-3: Accounting, Material Mgmt, Change Incorporation	MIDPOINT: Managerial Analysis, Change Incorporation
PM EVM EXPERIENCE	< 2 YRS Organizing, Scheduling, Managerial Analysis	2 – 5YRS Scheduling, Managerial Analysis	> 5YRS Managerial Analysis
TOTAL CONTRACT VALUE	≥ \$100M Work/Budget Authorization, Accounting, Managerial Analysis	\$50M < \$100M Work/Budget Authorization	\$20M < \$50M Scheduling
VALUE OF PRIME WORK REMAINING	> 50% Managerial Analysis, Change Incorporation	10 - 50% Managerial Analysis, Change Incorporation	< 10% Accounting, Material Management
VALUE OF SUBC WORK REMAINING	> 50% Work/Budget Auth, Scheduling, Subcontract Mgmt, Managerial Analysis	10 – 50% Work/Budget Auth, Scheduling, Subcontract Mgmt, Managerial Analysis	< 10% Accounting, Subcontract Management
VALUE OF MATERIAL REMAINING	>30% Work/Budget Auth, Scheduling, Accounting, Material Management	15 – 30% Accounting, Material Management	< 15% Material Management
VALUE OF MGMT RES REMAINING	< 5% BCWR Work/Budget Authorization, Change Incorporation	5 – 10% BCWR Work/Budget Authorization, Change Incorporation	> 10% BCWR Change Incorporation
OTB (RESETS)	2 or more Work/Budget Authorization, Change Incorporation, Scheduling	1 Work/Budget Authorization, Organizing	NIL Organizing
SV%, CV%, OR VAC%	> 10% Accounting, Indirect Management, Managerial Analysis	5 - 9% Indirect Management, Managerial Analysis	< 5% Managerial Analysis
CRITICAL PATH FLOAT	NEGATIVE – NO MARGIN Scheduling, Managerial Analysis	POSITIVE 15 - 40 WORK DAYS Scheduling	> 40 POSITIVE WORK DAYS Scheduling, Work/Budget Auth
BASELINE VOLATILITY	> 15% Change Incorporation, Accounting	5 - 15% Change Incorporation, Accounting	< 5% Managerial Analysis
INDIRECT RATES	NO FPRA Indirect Mgmt, Accounting	PROPOSED FPRA Indirect Mgmt, Accounting	APPROVED FPRA Indirect Management
ONGOING SYSTEMS ISSUES	MULTIPLE UNRESOLVED Affected Processes:	SINGLE UNRESOLVED Affected Processes:	NIL NA
TIME SINCE LAST REVIEW	>18 MO. All Process Groups	6 -12 MO. Processes Not Yet Reviewed	< 6 MO. Follow All Above

DESCRIPTION OF EVMS RISK ELEMENTS
Determine current phase of the project: Prior to CD-3, Post CD-3, Midpoint/2yrs
How many years of EVM experience does the Contractor's Program Manager have?
What is the total allocated budget of the EVM portion of the program?
<p>Start by splitting total BAC, BCWPcum, ACWPcum, and EAC as reported in the most recent CPR into two portions, prime and subcontractor(s), using whatever method the contractor uses to distinguish between the two. For each of these portions calculate:</p> <p>Estimated cost of work remaining, ECWR = EAC-ACWPcum</p> <p>For BCWR and ECWR, identify what percentage is the responsibility of the prime and what percentage is the responsibility of the subcontractor(s) as compared to the total effort remaining. (Subcontractor % plus prime % equals 100%).</p> <p>Budgeted cost of work remaining, BCWR = BAC-BCWPcum</p> <p>Estimated cost of work remaining, ECWR = EAC-ACWPcum</p>
For BCWR and ECWR, identify what percentage is the responsibility of the prime and what percentage is the responsibility of the subcontractor(s) as compared to the total effort remaining. (Subcontractor % plus prime % equals 100%).
MR usage trend. Compare MR usage over 12 – 18 month period, evaluate against MR remaining as a percentage of BCWR.
What is the number of times the baseline has been reset via Over Target Baseline since inception?
What is the SV%, CV%, and VAC% based on the most recent CPR?
To calculate total float/slack (Late Finish – Early Finish), examine remaining (incomplete) tasks on IMS's Critical Path, and identify the task with the least amount of float. Recall negative float indicates a constraint (i.e. delay in meeting contractual delivery); float should always be greater than or equal to zero; and excessive float usually indicates a problem with the logic connections.
Using the end of period Format 3 baseline plan for next 6 periods, calculate average percent change of PMB over a six month period (based on last 12 months of data).
Determine if the contractor a) has an approved/negotiated Forward Pricing Rate Agreement (FPRA); b) has submitted a Proposed FPRA; or c) has neither and is applying rates based on some informal basis.
<p>Ongoing System Issues - Looking at the CARs issued, how many systemic issues are still unresolved – Multiple, Single, or none? Consider the number of unresolved CARs escalated, if system compliance in jeopardy, or if system compliance has been revoked.</p> <p>Identify affected processes: Organizing, Scheduling, Work/Budget Authorization, Accounting, Indirect Management, Change Incorporation, Material Management, Subcontractor Management.</p>
How long has it been since this project was last reviewed under System-Level Surveillance? DOE 413-3B requires at least every 24 months. If it has been more than 12 months or is a new project that has never been reviewed, rate this element as high risk and consider this project for review for all process groups when prioritizing projects for EVMS System Surveillance. Likewise, if it has been 6 to 12 months since last reviewed, then rate this element as moderate risk and consider all processes not yet reviewed as moderate risk.

APPENDIX I --- WORK BREAKDOWN STRUCTURE (WBS)

1.1 **Purpose and Structure.** Following are guidelines for effectively preparing, understanding, and presenting a Work Breakdown Structure (WBS). It is intended to provide the framework for Department of Energy (DOE) Federal Project Directors to define their project's WBS and also be valuable guidance to DOE contractors in their application and extension of the contract's WBS.

1.2 **Applications.** There are two fundamental and interrelated WBS structures: the Project WBS and the Contract WBS. The Project WBS provides a framework for specifying project objectives. It defines the project in terms of hierarchically related, product-oriented elements and includes "other Government" elements (i.e., Project Office Operations, Manpower, Government Furnished Equipment (GFE), and Government Testing). Each element provides logical summary levels for assessing technical accomplishments, and for measuring cost and schedule performance.

The Contract WBS is the Government-approved WBS for project reporting purposes and includes all product elements which are the contractor's responsibility. It includes the contractor's discretionary extension to lower levels, in accordance with Government direction and the Contract Statement of Work (SOW).

The WBS serves as a coordinating medium. Through the Project WBS and the Contract WBS, work progress is documented as resources are allocated and expended. Performance, cost, schedule, and technical data are routinely generated for reporting purposes. The WBS is the infrastructure to summarize data for successive levels of management and provide appropriate information on projected, actual, and current status of the individual elements. When appropriately structured and used in conjunction with sound systems engineering principles, cost estimating, EVM, integrated scheduling, and risk management, the WBS allows for project status to be continuously visible so the FPD and contractor PM can identify, coordinate, and implement changes necessary for desired results.

The goal is to develop a WBS that defines the logical relationship among all project elements to an appropriate level that does not constrain the contractor's ability to define or manage the project and resources. In other words, the contract WBS is to be tailored to fit the contractor's scope of work. However, if the Government considers some project elements to be high cost or high risk, the project must be defined to a lower level of the WBS; this is reasonable if the product-oriented logical extension is maintained. The contractor should extend all other elements to the level based on the way the project is developed, produced, or managed. A secondary, but still important, goal is to provide a systematic and standardized method for gathering cost data across all projects. Having actual historical data to support project management and cost estimates for similar DOE projects is a valuable resource. It includes all the elements for the products which are the

responsibility of the contractor.

The WBS is defined, developed, and maintained throughout the project life cycle based on disciplined application of the systems engineering process.

The WBS requirements of an individual project also apply to that of a program. A program WBS is generated by integrating the applicable WBS modules of discrete projects into a hierarchical structure, in order to achieve a larger, more complex objective. An example of a program in DOE is site cleanup, where facility D&D projects, environmental remediation projects, and new facility construction projects with their own stand-alone WBS modules are combined together to achieve the objective of cleaning up an entire site. This allows a program to be treated and managed as a project in its own right just as the discrete projects are, and should therefore be subject to the same systems engineering processes and best practices as applied to individual projects. Where applicable, a program WBS should be developed using the same guidelines as an individual project.

- 2.1** **Project WBS.** The Project WBS encompasses an entire project, including the Contract WBS and “other Government” elements (e.g., Site Office Operations, manpower, GFE, and Government Testing). It defines at a high level what is to be procured and typically consists of at least three levels with associated definitions. The Project WBS is used by the FPD and contractor to develop and extend a Contract WBS. It contains uniform terminology, definitions, and placement in the product-oriented family tree structure. The FPD is responsible for creating the Project WBS and the Project WBS dictionary.
- 2.2** **Contract WBS.** The Contract WBS is the complete WBS as included in the DOE-approved Project WBS extended to the agreed-to contract reporting level and any discretionary extensions to lower levels for reporting or other purposes. It defines the lower level components of what is to be procured and includes all the product elements which are defined by the contractor and are their responsibility. This comprehensive Contract WBS forms the framework for the contractor’s management control system. The contractor is responsible for expanding the Project WBS to create the Contract WBS and for creating the Contract WBS dictionary.
- 2.3** **Relationship of Project WBS to Contract WBS.** The Contract WBS(s) should be aligned to the Project WBS. Contracts for WBS elements that are in the Project WBS will become Level 1 Contract WBS elements with all applicable Level 2 Common WBS elements included, resulting in the Contract WBS. Figure 2-3 depicts the development and relationship of the Project WBS with the Contract WBS. The following figure depicts the development and relationship of the Project WBS and Contract WBS.

PROJECT WBS				Contract WBS		
Level 1	Level 2	Level 3	Level 4	Level 1 (2)	Level 2 (3)	Level 3 (4)
Project	Facility 1	Site Prep	Grading & Landscaping Site Utilities Roads, Parking Lots and Walkways Support Equipment & Facilities Project Admin & Project Mgt.	Facility 1	Site Prep	Grading & Landscaping Site Utilities Roads, Parking Lots and Walkways Support Equipment & Facilities Project Admin & Project Mgt.
		Structure	Substructure & Foundation Superstructure Walls & Finishes		Structure	Substructure & Foundation Superstructure Walls & Finishes
		Utilities	Electrical Systems HVAC Plumbing Conveying Fire Protection Communications Systems Monitoring, Detection & Access Control		Utilities	Electrical Systems HVAC Plumbing Conveying Fire Protection Communications Systems Monitoring, Detection & Access Control
		Furniture, Fixtures, & Office Equipment Process/Scientific/Technical Equipment			Furniture, Fixtures, & Office Equipment Process/Scientific/Technical Equipment	
	Facility 2	Repeat Elements for Facility 1				
	System Test & Evaluation	Simulation (Cold Test) Integration Test Operational Test (Hot Test) Test & Measurement Equipment				Simulation (Cold Test) Integration Test Operational Test (Hot Test) Test & Measurement Equipment
	Project Admin & Project Mgt.	Technical Management Facilities Management Contract & Procurement Management Cost & Schedule Management Legal & Regulatory Environmental Compliance, Safety & Health Training Security			Project Admin & Project Mgt.	Technical Management Facilities Management Contract & Procurement Management Cost & Schedule Management Legal & Regulatory Environmental Compliance, Safety & Health Training Security

Figure 1: Relationship of Project WBS with Contract WBS

2.4 Subcontractors. Contractors, such as Management and Operating (M&O) contractors, should require subcontractors to use the WBS to fulfill contractual requirements and control the subcontract. The prime or associate contractor is responsible for incorporating WBS requirements into its subcontract. Figure 2 provides an example of a prime WBS and its relationship to a subcontract WBS. This shows how the prime contractor may further break down the Contract WBS to manage subcontracted work. It is the contractor's decision on how this will be accomplished. For example, if the Power Plant System is awarded as a Prime contract, the Project WBS in Figure 1 becomes the Prime WBS represented in Figure 2. The Prime contractor would then subcontract for the Site Work. Replacing the words "Project" and "Contract" from Figure 1 with "Prime" and "Subcontractor" respectively, the flow down to the WBS requirement can be shown in Figure 2. In this case the Project WBS could be both the Project and the Contract WBS.

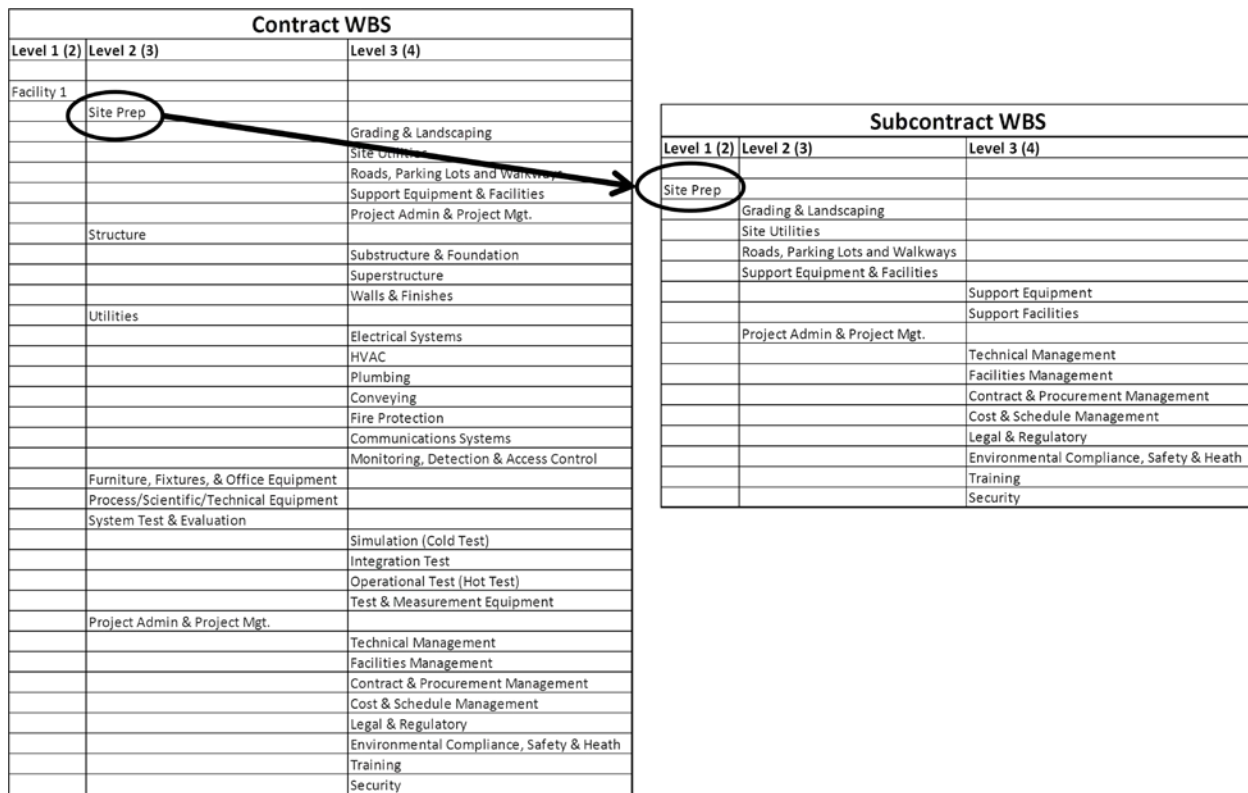


Figure 2: Relationship of Contract WBS to Subcontract WBS

2.5 Creating the WBS Dictionary. As part of developing a Project WBS, the Project Director will also develop a WBS dictionary. The dictionary lists and defines each WBS element. Although initially prepared by the Federal Project Director, the contractor expands the dictionary as the Contract WBS is developed. The initial WBS dictionary should be based on the generic definitions, made project specific to define the products being acquired. The dictionary shows the hierarchical relationship of the elements and describes what each WBS element is and the resources and processes required producing it. It also provides a link to the detailed technical definition documents. The WBS dictionary should be routinely revised to incorporate changes and should reflect the current status of the project throughout the project's life.

2.6 Use of Common Elements. The following are common WBS elements that should be applied to the appropriate levels within the WBS which they support:

- Integration, Assembly, Test & Checkout
- Support Equipment and Facilities
- System Test and Evaluation
- Project Administration/Project Management

- System Design and Engineering

The appropriate level is defined as that level of the WBS that requires direct support from a common element. In other words, if System Design and Engineering is required to support a Level 3 WBS element, the System Design and Engineering WBS element would appear at Level 4 of the WBS under the Level 3 element it supports. As these WBS items are not physical products, they should be associated with the lowest level of the WBS appropriate. For example, if Integration, Assembly, Test, and Checkout (IATC) scope can be associated with a lower-level item of the WBS, it should be placed in the WBS below that item and not placed at the top level of the WBS. However, if the scope is related to, for example, project-level IATC, only then should appear as a first level WBS item.

2.7 Organization of EVM Around a Product-Oriented WBS. From organization and planning to monthly reporting, EVM is organized around a single product-oriented Work Breakdown Structure (WBS) that spans the entire project. Control Accounts and Work Packages should be organized so that they map one-to-one with the project WBS. This one-to-one mapping then ties to a specific Control Account Manager (CAM) who is held responsible for completion of the specific work scope. When common element work scope is spread throughout the WBS, a contractor must ensure there is a clear methodology or definition of work to identify the specific CAM responsible for performance of the work scope. This linkage of management personnel to the WBS structure provides a clear delineation of responsibility and accountability for the completion of all work scope within the WBS.

Tasks within a Work Package are likely to be a combination of function-oriented and product-oriented activities, but to the extent possible, the tasks for Work Packages of similar products should be organized in a similar manner. This practice enhances the common use of performance measures, management of risks, and (appropriate) comparison and benchmarking of performance across WBS elements. With few exceptions, functional activities should be at the task or Work Package level, and if function-oriented elements are included in the WBS, they should be included only at the lowest level.

Planning tasks by WBS elements serves as the basis for mapping the technical baseline, for estimating and scheduling resource requirements, and mitigating risks. By breaking the total product into successively smaller entities, project directors can ensure all required products are identified in terms of cost, schedule, and performance goals in order to reduce risk. Corrective action can be taken to resolve deviations from the plan. This integrated approach to work planning also simplifies identifying the potential cost and schedule impacts of proposed technical changes.

Sub-totals in the EVM data in Contract Performance Report (CPR) Format 1 and Format 5 should follow the organization of the Project WBS. Likewise, the organization of the Resource Loaded Schedule (RLS) should follow the organization of the project WBS, supporting the use of sub-schedules at all lower levels of the WBS. Limitation on

resources is likely to be functional in nature and spread across a product-oriented WBS, which may make a product-oriented WBS inconvenient for functional managers. Fortunately, all modern scheduling software provides a means (additional fields) to tag schedule activities of specific type(s), and these tags can enable filtered display and aggregation across activities requiring specific functional resources.

Additional details regarding the WBS and specific WBS Best Practices are available at <http://energy.gov/management/office-management/operational-management/project-management/earned-value-management>.