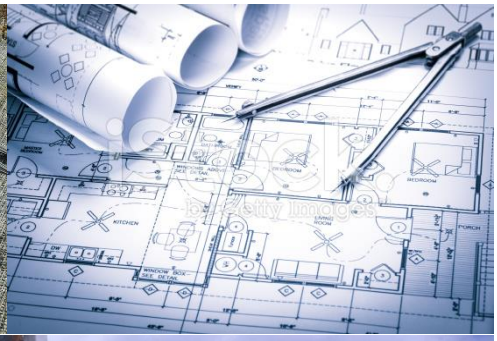

EARNED VALUE MANAGEMENT SYSTEMS INTERPRETATION HANDBOOK EVMSIH (2.0)

U.S. DEPARTMENT OF ENERGY
OFFICE OF PROJECT MANAGEMENT OVERSIGHT AND ASSESSMENTS (PM)
WASHINGTON, D.C.

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The Mission of the Energy Department is to Ensure America's Security and Prosperity by Addressing Its Energy, Environmental and Nuclear Challenges through Transformative Science and Technology Solutions

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DOCUMENT CHANGE CONTROL

VERSION	DATE	BRIEF DESCRIPTION OF UPDATES
1.0	September 30, 2015	• Initial Release
1.1 (DRAFT)	January 07, 2016	• Break Fix Changes • Test Formula Updates • Define Thresholds for Automated Tests • Clarifications • Not formally released but used to guide analysis/ testing during Roadside Assist Visits and Compliance Assessments during V2.0 development
2.0	August 31, 2016	• Moderate Content Changes • Consolidate Duplication and Redundancy • Separate Out QE LOI Testing Protocols in Companion Document • Streamline and Formatting Changes

1.0 INTRODUCTION

1.1 EVMS POLICY AND INTENT

Earned Value Management (EVM) is a widely accepted industry best practice for program and project management that is used across government and industry. In accordance with OMB Circular A-11 (Part 7 and the Capital Programming Guide), and the Federal Acquisition Regulation (Subparts 34.2 and 52), the Department of Defense (DoD) and all Civilian Federal Agencies (CFA) inclusive of the Department of Energy (DOE) must use a performance-based acquisition management system based on the Electronic Industries Alliance Standard-748 (EIA-748) Earned Value Management System (EVMS) Guidelines, to plan for and manage and assess the cost and schedule performance of major acquisitions.

An EVMS is a disciplined management system that integrates the work scope, schedule, and cost parameters of high-value, complex projects via systematic planning and effective monitoring and control, to permit a detailed assessment of the overall performance during the project's life. The EIA-748 Guidelines outline the qualities and characteristics of a credible, reliable, and compliant EVMS. By definition, a compliant EVMS: provides for the generation of timely, reliable, and verifiable performance data; permits the evaluation of progress; and allows for the calculated probability of meeting programmatic and contractual requirements for cost, schedule, and technical viability. A key aspect is the ability to capture physical technical progress verses the planned schedule and cost as an early warning indicator of performance.

EVM is founded on the premise that project teams make the best decisions when they have the best information. To be useful as a project management tool, EVM must be incorporated into the acquisition decision-making process. A properly designed and implemented EVMS should be key to effective risk and resource management by enabling identification of potential project issues early so that project teams can make informed, timely decisions resulting from seeing the full scope of a project's progress. While EVMS is but one of many tools used to plan and control project performance, when EVM information and data are deficient and do not accurately reflect current project status or provide acceptable forecasts, effective project management is impaired.

DOE executes its acquisition requirements through contracts. Those contracts define the requirements for scope, cost, schedule and applicable laws, industry standards, DOE Directives, and other performance requirements with which the contractor must comply. DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, invests the Office of Project Management Oversight and Assessments (PM) with the responsibility to develop policy, requirements and guidance for the planning and management of capital asset projects, inclusive of establishing, maintaining and executing the EVMS Certification and Surveillance Review processes in accordance with established levels to ensure full compliance with applicable FAR and OMB requirements. Compliance requirements defined in DOE O 413.3B include:

- For contractors where there are applicable projects with a total project cost (TPC) between $20M and $100M, the contractor shall maintain an EVMS compliant with EIA-748C.
- For contractors where there are applicable projects having a TPC of $100M or greater, PM must conduct the certification review process and certify the contractor's EVMS compliance with EIA-748C, or as required by the contract.

- On an exception basis, or at the request of the Project Management Support Office (PMSO), PM may conduct compliance reviews of contractors with applicable projects that have a TPC between $20M and $100M.

As the office of primary responsibility and single DOE voice for EVMS policy definition and external engagement for matters involving EVMS compliance, PM endeavors to work closely with affected PMSOs in the Program Offices including the National Nuclear Security Agency (NNSA), the Office of Science (SC), the Office of Environmental Management (EM), and the Office of Nuclear Energy (NE), and the Energy Facility Contractors Group (EFCOG), in the pursuit of consistent and compliant implementation. The result of consistent compliance with the 32 EIA-748 EVMS Guidelines should enable the Government to rely on accurate, valid, credible, timely, and auditable data produced by internal cost and schedule management control systems for determining product/deliverable oriented contract and project status.

1.2 PURPOSE OF THE EVMSIH

A uniform approach to interpretation of the EIA-748 EVMS Guidelines is a major element in DOE's vision for consistent and successful contract and project management and delivery - on or under budget and on or before schedule. Through a uniform interpretation of the intent of the EVMS Standard and considering the scope of the contract and any specific requirements for EVMS, DOE and the contractors who work for DOE, can achieve consensus in determining the appropriate EVMS principles to apply, methods of implementation and approaches for effective assessment of EVMS compliance determination. Additionally, having a single source for EVMS interpretation addresses the OMB directive to consider other agency EVMS compliance certifications, as appropriate, when entering into reciprocal agreements.

The DOE EVMS Interpretation Handbook (EVMSIH) 2.0, developed in collaboration with DOE and contractor EVMS experts, and based extensively on the complete EVM historical body of knowledge from industry and government organizations, as well as DOE unique situations and conditions, serves as the authoritative source for PM interpretation of and assessment of contractor EVMS compliance with the 32 EIA-748 guidelines. The DOE EVMSIH consolidates the necessary elements from the existing EVM body of knowledge into a single source for EVMS interpretation within DOE to ensure the consistency of expectations, implementation, and assessment. The EVMSIH provides the strategic intent behind each guideline in a qualifying expectation line of inquiry (QE LOI) format. Those QE LOIs are the general qualities of effective implementation that are tested to determine EVMS compliance.

The ultimate goal of the EVMSIH is to achieve convergence of EIA-748 EVMS compliance criteria and standards, reducing preparation costs and facilitating the assessment of progress and performance outcomes. A streamlined EVMSIH is key to simplifying EVMS compliance for contractors and the government analysts and stakeholders tasked with evaluating results.

Figure 1 below displays the five EIA-748 areas from left to right, with Indirect Considerations Guidelines 4, 13, 19, and 24 added as a separate column to the far right, to align with the approach used in this Handbook.

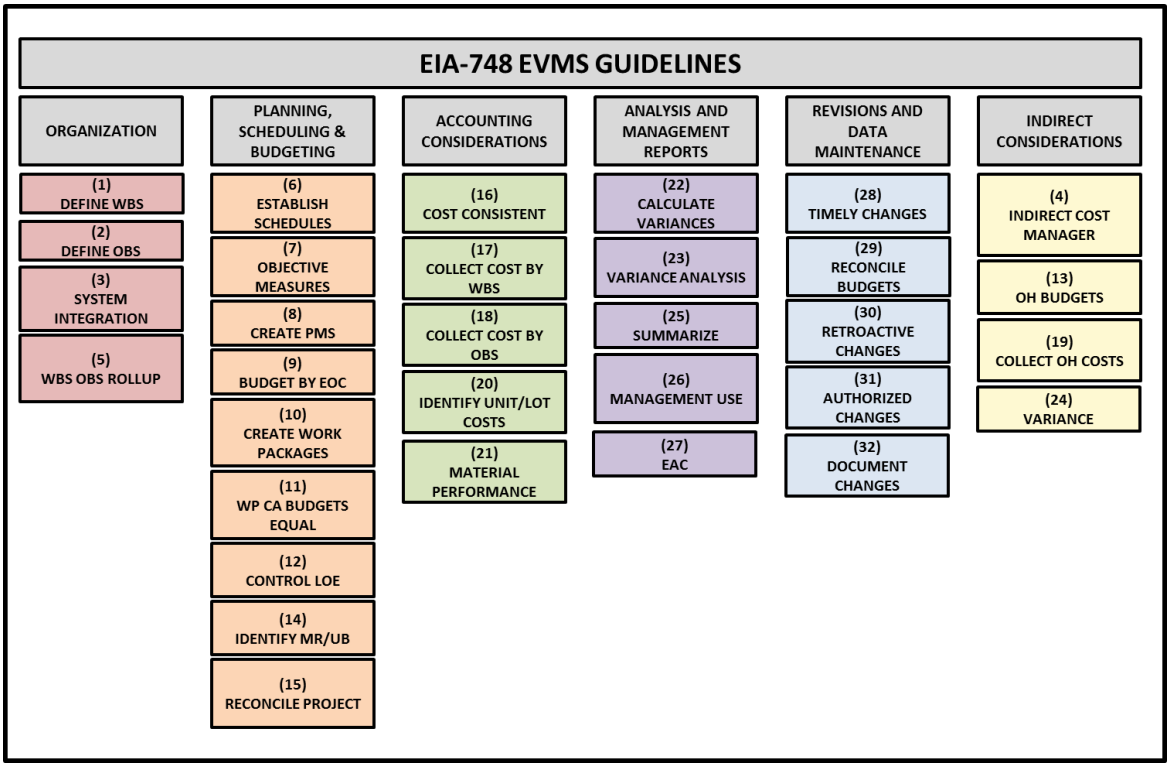


Figure 1 - EIA-748 EVMS Guidelines by Management Area Plus Indirects

The following strategies support the intended uses of the EVMSIH:

- Standardizes the requirements and expectations of EIA-748 EVMS compliance;
- Standardizes the EVMS compliance and surveillance review assessment process;
- Serves as guidance for EVM System Descriptions;
- Serves as guidance for contractors when conducting self-assessments of compliance;
- Serves as guidance for the Performance Measurement Baseline (PMB) development and control process; and
- Serves as a training tool for DOE Federal staff and DOE contractors.

A uniform approach to EVMS compliance determination by the Government and the genuine adoption of common management attributes across industry sectors reinforces EVM as a widely accepted best practice for project management. The use of project management best practices, when incorporated within all areas of an EIA-748 EVMS, including commercial applications, can lead to results that are superior to those achieved by other means. Providing for the consistent interpretation of EIA-748 EVMS Guidelines can make the difference between creating an authentic connection to a necessary management principle or the implementation of a burdensome and costly routine. Thus, a contractor's EVMS, while remaining compliant with the full body and intent of the EIA-748 EVMS Guidelines, can be tailored, adapted, or developed for the unique needs of the contract and project.

There is value in using this Handbook that should be considered by when determining the appropriate lines of inquiry to use for EVMS assessments when certification per DOE O 413.3B is not the driving requirement. The handbook is an integral source when conducting any type of review where the project baseline cost or schedule is being assessed (e.g., Independent Cost Reviews or Estimates, External

Independent Reviews, Project Peer Reviews, etc.,), or for discussing a compliance question or concern related to EVMS or scheduling.

In summary, the EVMSIH addresses the qualifying expectations, meaning behind the QE LOIs, and how each Guideline is verified. This handbook provides an EVMS review that is a data-driven dependent process, and a consistent and repeatable approach. It is important to read the following pages carefully and follow the "how to" instructions to fully implement an EVMS and successfully pass a DOE PM EVMS compliance review. For questions about this document, EVMS Guideline interpretations, or requirements, please visit the PM homepage (http://www.energy.gov/pm) for the appropriate EVMS point of contact.

1.3 EVMS COMPLIANCE

It is typical for DOE contracts to require the management system and processes (i.e., tools, techniques, and procedures) used by the contractor's project management staff to be formally documented in either an EVM System Description (EVM SD), which is either a stand-alone document or a set or series of integrated process descriptions/procedures that describe the contractor's approach to a compliant EVMS. This documentation describes how the contractor's business processes and associated data/work products meet the intentions of the Guidelines through each QE LOI. The work products identified in the EVMSIH summarize the type of documentation or system inputs/outputs needed for, or resulting from, the integration of subsystems and processes that a contractor may use to effectively manage its projects.

As part of compliance assessments, contractors are expected to both explain and demonstrate how the integrated parts of the EVMS are used to comply with the Guidelines regardless of EVM reporting requirements that are defined in the contract. The system must be described with a written EVMS description and demonstrated through actions that show the EVMS complies with the stated intent of the Guidelines. The flow down of an EIA-748 EVMS requirement to a subcontractor requires special consideration to ensure subcontractor compliance with the Guidelines and for the prime contractor to incorporate the subcontractor EVMS data into its EVMS. It is incumbent upon the prime contractor to develop and demonstrate an effective methodology for managing the integration of its subcontractors into their EVMS. At all times, the prime contractor retains complete responsibility for the EVM reporting on the full project.

There are three steps for evaluating compliance: (1) assess whether the contractor's EVM SD adequately documents how its system meets the intent of the Guidelines, (2) evaluate the contractor's ability to demonstrate the EVMS implementation as described by the SD and supplemental procedures, and (3) ensure the EVMS is providing timely, accurate, reliable and auditable data. Compliance is determined based upon the results of all three steps.

The DOE EVMS compliance process uses a data-driven approach to efficiently test the reliability of core management processes from the initial implementation of a project and continually thereafter to reduce the risk of system failure during sustainment and maintenance of the project. The approach remotely tests a contractor's EVMS data, thus eliminating the need for multiple DOE interviews and assessments (and the labor and travel costs associated with numerous people visiting a contractor's site).

Markers in the contractor EVMS data point to emerging issues, allowing a contractor to take preemptive action to remedy those issues before they escalate to major deficiencies. Then persistent EVMS concerns are addressed by a much smaller and more efficient DOE team, who has specific expertise tailored to the precise issue. A standard set of data provides both the DOE and the contractor with a timely diagnosis

of the issue, and ensures common reference points for discussion. It also pinpoints or limits the area of concern, thus ensuring that additional resources are not invested in areas where there are no identified deficiencies.

The primary objective of the compliance review is to assess whether the EVMS processes and implementation are compliant with the EIA-748 EVMS Guidelines in order to ensure that contractors use effective internal cost and schedule management control systems and that the Government will be able to rely on accurate, valid, reliable, timely, and auditable data produced by those systems for determining product-oriented contract status. The compliance review should not look for the "perfect" EVMS, but rather one that is as useful as possible for the purpose of project management and that meets the minimum standards of the EIA-748 EVMS Guidelines. Nonetheless, continuous improvement of the contractor's EVMS is an expectation along with their ability to self-govern their EVMS compliance status.

The size and complexity of the project(s) implementing an EVMS requirement may affect the way in which the contractor achieves many of its EVMS objectives. The size and complexity of the contractor (or business unit) itself also might affect the risks of EVMS implementation deficiencies and the controls necessary to address those risks. Scaling the EVMS review is most effective as a natural extension of the risk-based approach and applicable to all contractors. Accordingly, a smaller, less complex project, or even a larger, less complex project might achieve its EVMS objectives differently than a more complex project. It is important that the EVMS Review Director be an active participant in the review process to ensure the timeliness of EVMS reviews, the consistent application of operating procedures and EVMS guideline interpretations, and precedent-based determinations. The compliance review will assess the typical five areas of the EIA-748 EVMS Guidelines (Organization; Planning, Scheduling, and Budgeting; Accounting Considerations; Analysis and Management Reports; and Revisions and Data Maintenance; with Indirect Considerations separated as a sixth area as previously noted and shown on Fig. 1) or one or more of the nine processes associated with the EIA-748 EVMS Guidelines (Organizing; Scheduling; Work/Budget Authorization; Accounting; Indirect Management; Managerial Analysis; Change Incorporation; Material Management; and Subcontract Management) (Fig. 2).

Figure 2 - EIA-748 EVMS by Management Process

1.4 MATERIALITY

The Review Team's primary objective in a review of an EVMS is to make an appraisal on the EVMS taken as a whole. During the course of a review, the Review Team may become aware, through the application of review procedures or communication from contractor personnel, of deficiencies that may be of interest to the Government. An EVMS guideline deficiency may consist of either a design or operating deficiency. A design deficiency exists either when a necessary process is missing or when an existing process is not properly designed so that even when the system is operating as designed, EVM objectives are not always met. An operating deficiency exists when either a properly designed process is not operating as designed, or the person performing a process does not possess the necessary authority or qualifications to execute the process effectively. EVMS deficiencies range from inconsequential deficiencies to material weaknesses in meeting the intent of an EVMS guideline.

Material impact is a matter of professional judgment influenced by the perception of the needs of a reasonable person who relies on the performance measurement reports and financial statements. Materiality judgments are made in light of surrounding circumstances and involve both quantitative and qualitative considerations, including the number of discrepancies observed, the associated absolute dollar value impact, the importance of item(s) to the accomplishment of contract requirements, and the potential to breach a project baseline and/or impact Government funding.

1.5 CONTENT AND FORMAT OF THE EVMSIH

The Handbook is used by the DOE to classify and code the definition and intent of all 32 Guidelines, attributes, and testing protocols in conjunction with the evaluation and demonstration for compliant EVMS. By deconstructing each of the 32 Guidelines, the practitioner can break the requirements into more manageable segments towards meeting the requirements of FAR 34.2 – Earned Value Management System and DOE O 413.3B. It is critical to understand that each guideline has a general purpose and well-defined QE LOI (i.e., qualities and characteristics) that make each guideline distinct from the others. Furthermore, test steps can be developed to determine the performance of each of these attributes. While there may be multiple tests for each QE LOI, each test step provides unique insight into the performance of the EVMS. Unique test metrics can be collected to quantify this performance.

A uniform approach to evaluate the performance of the EVMS in the manner described above safeguards the fairness of EVMS compliance proceedings throughout the DOE. Making a correct Guideline interpretation can make the difference between creating an authentic connection to a necessary management principle or the implementation of an unwarranted, burdensome, and costly routine.

This document provides the background and purposes of implementing the EIA-748 Earned Value Management System (EVMS), including definitive statements on EVMS guideline definitions, interpretations, and key attributes of a compliant management control system. Its purpose is to simplify and modernize a consistent definition of the 32 EIA-748 EVMS Guidelines at the level that they can best be understood.

This Handbook contains seven sections plus Appendices as defined below:

- Section 1.0, Introduction, provides the purpose of the Interpretation Handbook, and an overview of DOE EVM policy and the EVMS compliance assessment process
- Section 2.0 contains the Organization Guidelines 1 through 5
- Section 3.0 contains the Planning, Scheduling, and Budgeting Guidelines 6 through 15
- Section 4.0 contains the Accounting Considerations Guidelines 16 through 21
- Section 5.0 contains the Analysis and Management Reporting Guidelines 22 through 27

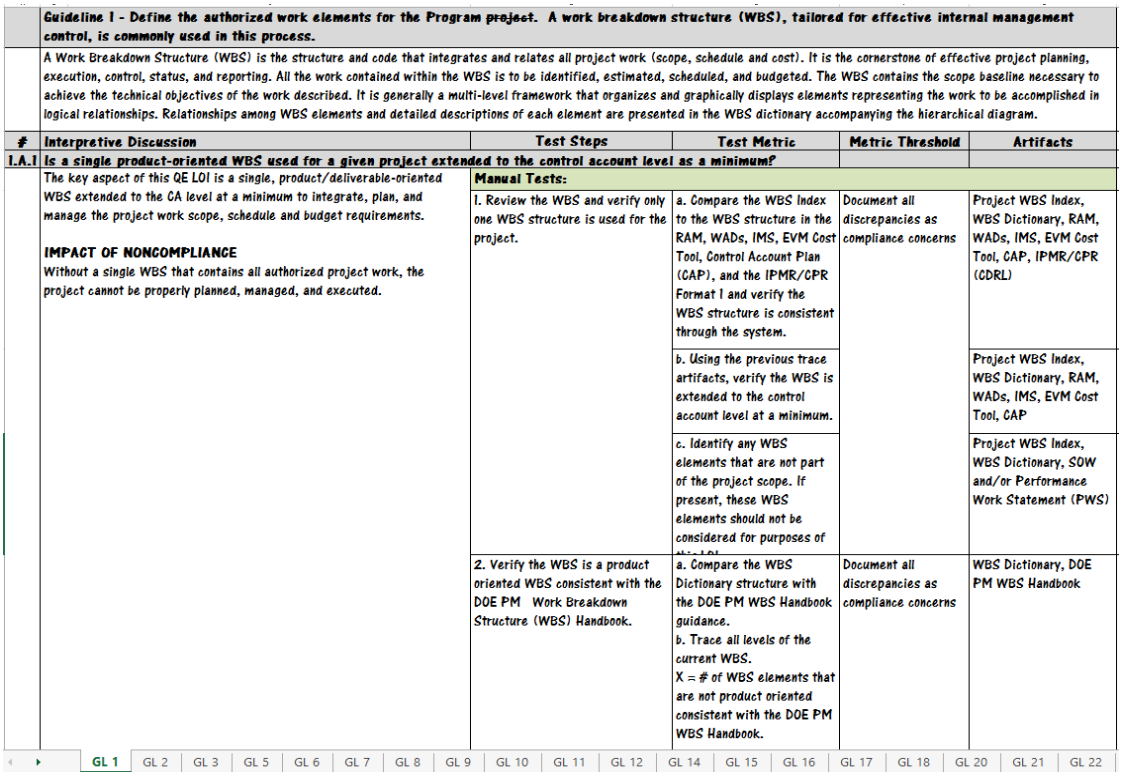
- Section 6.0 contains the Revisions and Data Maintenance Guidelines 28 through 32
- Section 7.0 contains the Indirect Guidelines 4, 13, 19, and 24
- Appendix A – Glossary of the acronyms and abbreviations
- Appendix B – Definitions for acronyms and abbreviations
- Appendix C – References contained in the EVMSIH
- Appendix D – Table of QE LOI

Topics can be located in three ways:

- Table of Contents: provides a detailed listing of the various topics in each section. The titles of each section are intentionally descriptive to enable users to easily find their particular topic.
- Index: indicates the specific sections where key words are used.
- Guideline Intent Discussion: provides a summary-level overview of the characteristics, key points, and impact statement.

Sections 2.0 through 7.0 expand on guideline definitions, interpretations, and key attributes of a compliant management control system. The division of EVMS Guidelines into management groups is aimed at enhancing a common understanding of the EVMS Guideline characteristics and their application towards the practice of project management. The hierarchical structure used to define the qualities and operating characteristics of the EVMS Guidelines will include a definition of the Guideline, a brief discussion on the purpose of the Guideline, and the attributes of the Guideline.

To support the compliance expectations identified in Sections 2.0 through 7.0, a companion document to this Handbook, referred to as the EVMSIH Test Protocols, in spreadsheet form, is available. It defines the universe of EVMS testing protocols and data requirements. It organizes information into standard groupings that allow for the easy storage, retrieval, and analysis of EVMS compliance information for evidenced-based decision making; sharing and comparing EVMS compliance information; and data comparisons across projects and contractors. Additionally, the classification of QE LOI and testing protocols will help DOE to speed review results with greater precision. The companion document is intended to provide boundaries to the content expectations. These boundaries are presented as "Interpretive Discussions", not comprehensive descriptions of the full range of content; they do not stand alone, but rather, work in conjunction with the content found within the EVMSIH. Figure 3 provides the boundaries that explain the testing protocol for each QE LOI requirement. Appendix D provides the complete listing of QE LOI.



	Guideline 1 - Define the authorized work elements for the Program project. A work breakdown structure (WBS), tailored for effective internal management control, is commonly used in this process.				
	A Work Breakdown Structure (WBS) is the structure and code that integrates and relates all project work (scope, schedule and cost). It is the cornerstone of effective project planning, execution, control, status, and reporting. All the work contained within the WBS is to be identified, estimated, scheduled, and budgeted. The WBS contains the scope baseline necessary to achieve the technical objectives of the work described. It is generally a multi-level framework that organizes and graphically displays elements representing the work to be accomplished in logical relationships. Relationships among WBS elements and detailed descriptions of each element are presented in the WBS dictionary accompanying the hierarchical diagram.				
#	Interpretive Discussion	Test Steps	Test Metric	Metric Threshold	Artifacts
1.A.1	Is a single product-oriented WBS used for a given project extended to the control account level as a minimum?				
	The key aspect of this QE LOI is a single, product/deliverable-oriented WBS extended to the CA level at a minimum to integrate, plan, and manage the project work scope, schedule and budget requirements. IMPACT OF NONCOMPLIANCE Without a single WBS that contains all authorized project work, the project cannot be properly planned, managed, and executed.	Manual Tests:			
		1. Review the WBS and verify only one WBS structure is used for the project.	a. Compare the WBS Index to the WBS structure in the RAM, WADs, IMS, EVM Cost Tool, Control Account Plan (CAP), and the IPMR/CPR Format 1 and verify the WBS structure is consistent through the system.	Document all discrepancies as compliance concerns	Project WBS Index, WBS Dictionary, RAM, WADs, IMS, EVM Cost Tool, CAP, IPMR/CPR (CDRL)
			b. Using the previous trace artifacts, verify the WBS is extended to the control account level at a minimum.		Project WBS Index, WBS Dictionary, RAM, WADs, IMS, EVM Cost Tool, CAP
			c. Identify any WBS elements that are not part of the project scope. If present, these WBS elements should not be considered for purposes of		Project WBS Index, WBS Dictionary, SOW and/or Performance Work Statement (PWS)
		2. Verify the WBS is a product oriented WBS consistent with the DOE PM Work Breakdown Structure (WBS) Handbook.	a. Compare the WBS Dictionary structure with the DOE PM WBS Handbook guidance. b. Trace all levels of the current WBS. X = # of WBS elements that are not product oriented consistent with the DOE PM WBS Handbook.	Document all discrepancies as compliance concerns	WBS Dictionary, DOE PM WBS Handbook

GL 1 | GL 2 | GL 3 | GL 5 | GL 6 | GL 7 | GL 8 | GL 9 | GL 10 | GL 11 | GL 12 | GL 14 | GL 15 | GL 16 | GL 17 | GL 18 | GL 20 | GL 21 | GL 22

Figure 3 – Companion Document: EVMSIH Test Objectives by QE LOI

1.6 APPROACH TO TERMINOLOGY

This document uses standard terminology as defined in the Glossary. Contractors may use different terms. For example, the "Data Dictionary" may be titled "Schedule Nomenclature." Compliance is demonstrated by meeting the QE LOI and data trace intent and not necessarily through the specific terminology of an artifact or tool used. This document frequently uses the term "days." Unless otherwise specified, the default is working days as identified by the contractor's accounting calendar.

Unless otherwise specified, the intended timeframe over which automated tests or traces are conducted to demonstrate compliance is a period of three months. This time period means that until a test can be repeated over a consecutive three-month period with acceptable results, the system has not been demonstrated to show systematic and sustained compliance with the intent of the QE LOI. Within this document, the terms "must," "shall," "should," "may," and "recommended" are defined as follows:

- "Must" or "shall" are used to indicate an absolute requirement.
- "Should" is used to indicate an attribute or objective that must be addressed but not specifically as stated; the full implications must be understood and carefully weighed before choosing a different approach.
- "May" or "recommended" are used to indicate a recommended but discretionary approach based on established good practices.

1.7 GENERAL TOPICS TO UNDERSTAND GUIDELINE INTENT

1.7.1 OVERALL COMPLIANCE

Traditionally, compliance with the EVMS standard is based on how many guidelines are noncompliant. Defining the QE LOIs below the guideline may raise a concern of lower checkpoints and increased opportunities for noncompliance. There is no expectation that one QE LOI will cause the contractor to be noncompliant overall and lose an EVMS certification. It is expected, however, that every QE LOI not met may result in a Corrective Action Request (CAR) requiring contractor action. Additionally, test results may be summarized into a single CAR by related issues as warranted.

The number of noncompliant guidelines and QE LOIs that would equate to a determination of overall noncompliance and potential loss of system certification depend on many factors. There are CARs that have a significant impact on data accuracy, are pervasive, and may require months to fix, whereas other CARs may have a minor impact, are limited, and can be fixed within the review. Compliance assessment has always been and will continue to be a judgment call based on the reliability of the overall system to produce accurate and timely data, as well as useful information to effectively manage the project including scheduling, work authorization, budgeting, assessment, analysis, corrective actions, and change control practices employed by the contractor.

1.7.2 PROJECT VERSUS PROGRAM

DOE O 413.3B requires capital asset projects greater than or equal to $20M to implement an effective EVMS. Some sites have a contract requirement above the project level known as the program level.

Note: The DOE O 413.3 requirement in this project context is at the total federal cost level or total project cost (TPC). EVM Certification and Surveillance reviews are against the capital asset projects required by DOE O 413.3. For capital asset projects under an umbrella EVMS contract requirement at the program level (e.g., an M&O contract or EM Cleanup contract), it is incumbent on the contractor to define or be able to produce for each capital asset project:

- A unique WBS and OBS with RAM for the capital asset project(s).
- A unique IMS.
- A unique EVM Cost Tool equivalent.
- Unique variance analysis and revision control.
- A project unique IPMR/CPR as required.
- Be able to demonstrate compliance with the standard in all aspects at the capital asset level for all projects at that site consistent with DOE O 413.3.
- Be able to respond to EVMS review "data calls" with project unique information.

1.7.3 CONDUCTING EVMSIH TESTS

The EVMSIH tests define what is expected and how it is verified for each QE LOI. Some redundancy occurs between different QE LOIs as there are interrelationships between the guidelines. Follow-up closure reviews are used to verify the QE LOIs that are still a concern without repeating all of the EVMSIH tests.

Data-driven testing can reveal vital information about the cause of a deficiency and its symptoms (diagnosis) and is invaluable in monitoring the effects of any corrective actions. Following a data-driven approach, the contractor provides a sample of raw data from the contractor's EVMS to DOE for specific artifacts on a periodic basis. DOE will perform the EIA-748 EVMS guideline tests on the sample data, will calculate the individual EVMS metrics, and will make metric results available to the contractor. If

there are any anomalies, DOE will respond only to those metric values that are outside of the defined threshold value. The expectation is that by documenting, classifying, and sequencing the QE LOI of an EVMS, contractors will be able to find the underlying causes of core management process issues. Prescribed rules, weighting criteria, mathematical equations, and probability formulas will be used to make predictions that we can learn from in order to identify and change inefficient behaviors. Anomalies from past trends can be identified to help spot new trends that are emerging that could result in noncompliance if left unattended.

2.0 ORGANIZATION

This section focuses on the fundamental preparations for executing the project technical objectives to ensure effective management control of the project. The primary objectives of the five guidelines (1 – 5) that comprise this category are to establish the basic framework for capturing all contractually authorized work to be accomplished, identify the functional organization hierarchy responsible for accomplishing that work, and create an integrated structure that allows for management control of all effort.

A structured approach for decomposing the project work into manageable segments creates the Work Breakdown Structure (WBS) wherein each WBS element contains a specific scope of work. The work is defined in the WBS Dictionary and includes a description of the technical scope for each element. The WBS also provides the basic structure for planning, budgeting, scheduling, cost accounting, work authorization, measuring progress, data collection, reporting project status, and management control (Guideline 1). The establishment of an organizational structure (i.e., Organization Breakdown Structure (OBS)) is to assign organizational responsibility, accountability, and authority for all the project work. It identifies which organizations in the corporate structure, to include major subcontractors, have responsibility for work accomplishment (Guideline 2) and must be supported by Organizational Charts identifying management.

The Organization guidelines require the use of a fully integrated management system to execute the project. The planning, scheduling, budgeting, work authorization, and cost accumulation management subsystems must integrate in the EVMS such that the data derived from one system is relatable to and consistent with the data of each of the other systems. The integration provides the capability for establishing the Performance Measurement Baseline (PMB), identifying work progress, and collecting actual costs, facilitating management analysis, and corrective actions. The proper integration of the contractor's business systems and EVMS subsystems ensures the information and performance data retrieved from the EVMS is timely, accurate, reliable, and auditable (Guideline 3). In addition, the guidelines require the contractor to identify and document who within the company hierarchy is responsible for establishing controlling, and managing indirect budgets (e.g., overhead, General & Administrative, and Cost of Money) (Guideline 4).

The assignment of organizational elements to specific WBS elements establishes the control accounts (CAs), which are the primary management control point for work authorization, budgeting, cost accumulation, and performance measurement (Guideline 5). Through creating CAs, the contractor PM communicates who [i.e., the Control Account Manager (CAM)] in the organization is given authority and responsibility to manage, control, and facilitate the allocation of resources to accomplish a specific scope of work. The CAM is ultimately responsible for the cost, schedule, and technical performance associated with accomplishing the scope of work within a control account. The CAM is also responsible for planning the resources necessary to accomplish that scope of work. In some cases, particularly in a construction environment, other functional organizations (e.g., Planning, Business Operations, etc.) may assume a more active role in the planning and management of resources in support of the CAM's responsibilities. In this scenario, effective internal bilateral communication between the CAM and the functional organization is essential to ensure accomplishment of the CAM's responsibility for managing the execution of the CA scope of work.

DOE's interpretation of EIA-748 Guidelines Subsections 1-3 and 5 are contained below. Guideline 4, covering indirect, is covered in summary with the details in Section 7.0 Indirect Guidelines (Guidelines 4, 13, 19, 24).

GUIDELINE 1 – DEFINE THE WBS

DEFINE THE AUTHORIZED WORK ELEMENTS FOR THE PROGRAM. A WORK BREAKDOWN STRUCTURE (WBS), TAILORED FOR EFFECTIVE INTERNAL MANAGEMENT CONTROL, IS COMMONLY USED IN THIS PROCESS.

PURPOSE OF THE GUIDELINE

A Work Breakdown Structure (WBS) is the structure and code that integrates and relates all project work (scope, schedule and budget). It is the cornerstone of effective project planning, execution, control, status, and reporting. All the work contained within the WBS is to be identified, estimated, scheduled, and budgeted. The WBS contains the scope baseline necessary to achieve the technical objectives of the work described. It is generally a multi-level framework that organizes and graphically displays elements representing the work to be accomplished in logical relationships. Relationships among WBS elements and detailed descriptions of each element are presented in the WBS dictionary accompanying the hierarchical diagram.

MANAGEMENT VALUE OF THE GUIDELINE

The WBS is used as a management tool throughout the life cycle of a project to identify, assign, and track its total work scope. The WBS dictionary is a key project definition tool that defines in-depth the scope for each work element; documents assumptions about the work, including deliverables, milestones/key performance parameters, and quantities (if applicable); lists required resources and processes to accomplish the work; identifies a completion schedule, including measurable milestones; and provides links to key technical design or engineering documents. When completed, the WBS will provide a framework for various and extensive management and control purposes. The WBS will be used as the beginning point for all work task planning, the assignment of work to responsible organizations, work authorization, scheduling, budgeting, cost accumulation, performance analysis, and revisions to planning. Lastly, the WBS will provide the framework for data/information reporting. Hence the WBS is, perhaps, one of the single most important documents/exhibits prepared in support of the EIA-748 compliance. Any weakness in the WBS can have far-reaching and debilitating effects upon performance measurement and contract accomplishment as management control is proportionately eroded. The guideline is further defined by Qualifying Expectations Lines of Inquiry (QE LOI) shown below.

IMPACT OF NONCOMPLIANCE

Failure to link scope with the WBS may result in required work being omitted or unauthorized work being performed.

QE LOI DISCUSSION

1.A.1. IS A SINGLE PRODUCT-ORIENTED WBS USED FOR A GIVEN PROJECT EXTENDED TO THE CONTROL ACCOUNT LEVEL AS A MINIMUM?

The key aspect of this QE LOI is a single, product/deliverable-oriented WBS extended to the CA level at a minimum to integrate, plan, and manage the project work scope, schedule and budget requirements. In all cases, the contractor must extend the WBS to a level needed for effective internal management control. This level should not be an arbitrary level established across the project. The WBS is a direct representation of the work scope of each specific project that

documents the hierarchy and description of the activities to be performed and their relationship to the project deliverables. The WBS is used as a nomenclature that demonstrates integration of the scope, schedule, and budget systems of the project. Therefore, only one WBS is logical and acceptable. The WBS represents the complete project scope.

A Work Breakdown Structure (WBS) is a decomposition of all the work necessary to complete a project. A WBS is arranged in a hierarchy and constructed to allow for clear and logical groupings, either by product or deliverable. The WBS should represent the work identified in the approved Project Scope Statement and serves as an early foundation for effective schedule development and cost estimating. Projects will develop a WBS as a precursor to a detailed project schedule. The WBS should be accompanied by a WBS Dictionary, which lists and defines all the work of a project in an organized way. It should be noted that the WBS is not the organization that will management the work, functional or other. The OBS in guideline 2 is used to represent functional consideration the way the project is going to be managed Large, complex projects are organized and comprehended by breaking work into progressively smaller pieces until all work scope is a collection of control accounts and defined work packages that typically include a number of activities. It is often portrayed graphically as a hierarchical tree and tabular listing extending down to the activities that appears in the project schedule. A control account can contain either a single or multiple deliverables and should span enough time so that its progress can be measured and a trend established that can be used to affect the outcome of that control account. On medium to large projects, it is recommended that a control account should be between 9 and 18 months (3-6 QTRs) in length.

For projects involving scope content being implemented by other performing entities, the WBS should also reflect this work content within the overall hierarchy of project work. While other performing entities may, or may not have standard contractual arrangements, they are nonetheless responsible for specified WBS elements through some type of directed agreement arrangement with DOE. This work content must also be subdivided to an appropriate level of product-oriented detail for project planning, control, and reporting. The resulting work elements must be clearly identified and included within the project WBS under the correct hierarchical branches in just the same manner as prime contractor WBS elements.

As the end product is decomposed into smaller sub products at lower WBS levels, the work effort required by each element can be identified to functional organization units at a lower organizational level. At some level on each WBS branch, management will assign responsibility for technical, schedule, and cost performance. It is at this intersection of WBS element and organization unit that a Control Account (CA) is usually established, work is scheduled, budget is planned, cost is collected, and performance is measured, recorded and controlled. The technical content and requirements for each work product must be clearly specified and documented. As project work is accomplished, actual completion and technical requirements can be verified.

The WBS level at which a CA is established is primarily a function of the size of the project and the type of product. The responsible organization level is a function of the management span of control and upper management's desire to delegate technical, schedule, and cost responsibility for WBS elements to lower management levels. It should be understood that all CAs do not have to be established at the same level within the WBS structure. A CA may be subdivided further into Work Packages (WPs) and Planning Packages (PPs). A WP provides further detail on work content that is considered near-term, while a PP defines far-term work at a summary level. Each product branch

within the WBS only needs to be subdivided as far as needed to allow for adequate management, insight, and control.

IMPACT OF NONCOMPLIANCE

Without a single WBS that contains all authorized project work, the project cannot be properly planned, managed, and executed.

1.A.2. DOES THE WBS INCLUDE ALL AUTHORIZED PROJECT WORK INCLUDING THE IDENTIFICATION OF WORK SCOPE TO BE PERFORMED BY SUBCONTRACTORS AND ANY REVISIONS RESULTING FROM AUTHORIZED CHANGES AND MODIFICATIONS?

The complete and proper identification of all contractually authorized work following a WBS hierarchy provides the project a framework that represents all contract work scope at any point in time, and facilitates correlation between the contract scope (e.g., Statement of Work, Design Build Specifications, etc.) and technical/performance criteria.

One of the functions of the WBS is integration of work scope to ensure all of the project scope is performed and to limit out-of-scope work from being performed. The scope is integrated with the WBS in the WBS dictionary which is broken down, as a minimum, to the CA level. The WBS should never contain unauthorized work scope.

Subcontracted work, if any, must also be included. The approach to subcontractor implementation depends on the decision for flow down of EIA-748 EVMS requirements to the subcontractor. All other factors equal, subcontractors with an EIA-748 EVMS flow down may be integrated at a higher WBS level than subcontractors without an EIA-748 EVMS flow down. The subcontracted effort may provide for delivery of a single lower-level WBS element, such as a vendor-fabricated module. In other cases, the subcontract may provide for effort covering several lower-level WBS elements, such as design for core systems and instrumentation in a new facility. In either case, the prime contractor's WBS dictionary (and other management control systems) must be capable of uniquely distinguishing major subcontractors′ responsibilities from each other and from the work retained in-house by the prime contractor. This distinction is accomplished at the lower levels of the WBS. Figures 4 and 5 below provide WBS examples.

IMPACT OF NONCOMPLIANCE

Failure to link scope with the WBS may result in required work being omitted or unauthorized work being performed.

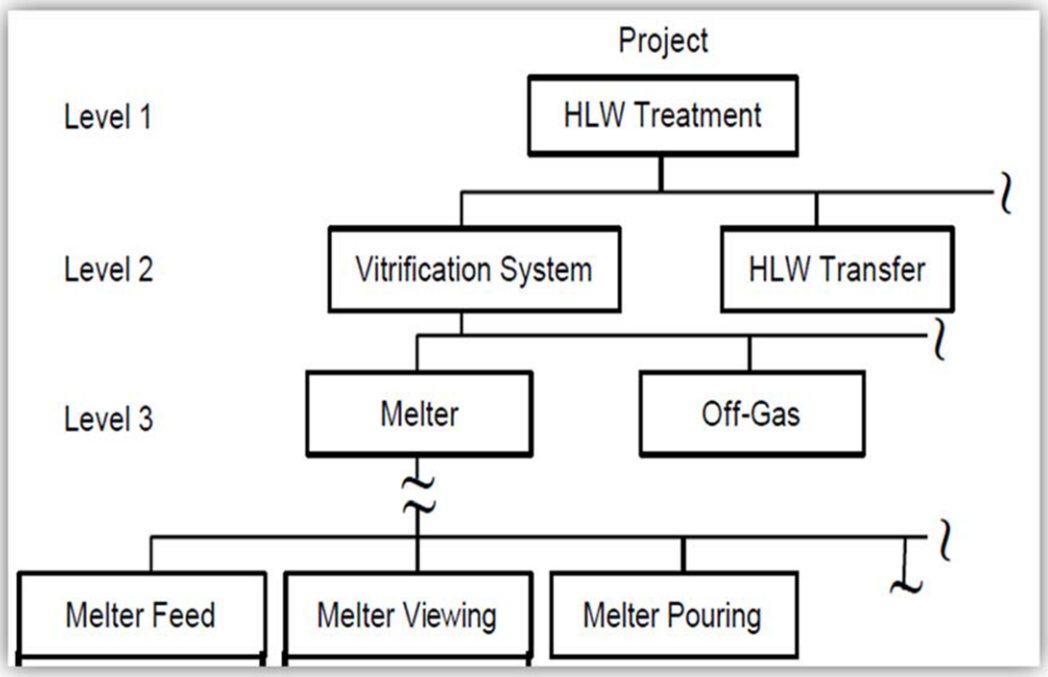


Figure 4 - Sample WBS

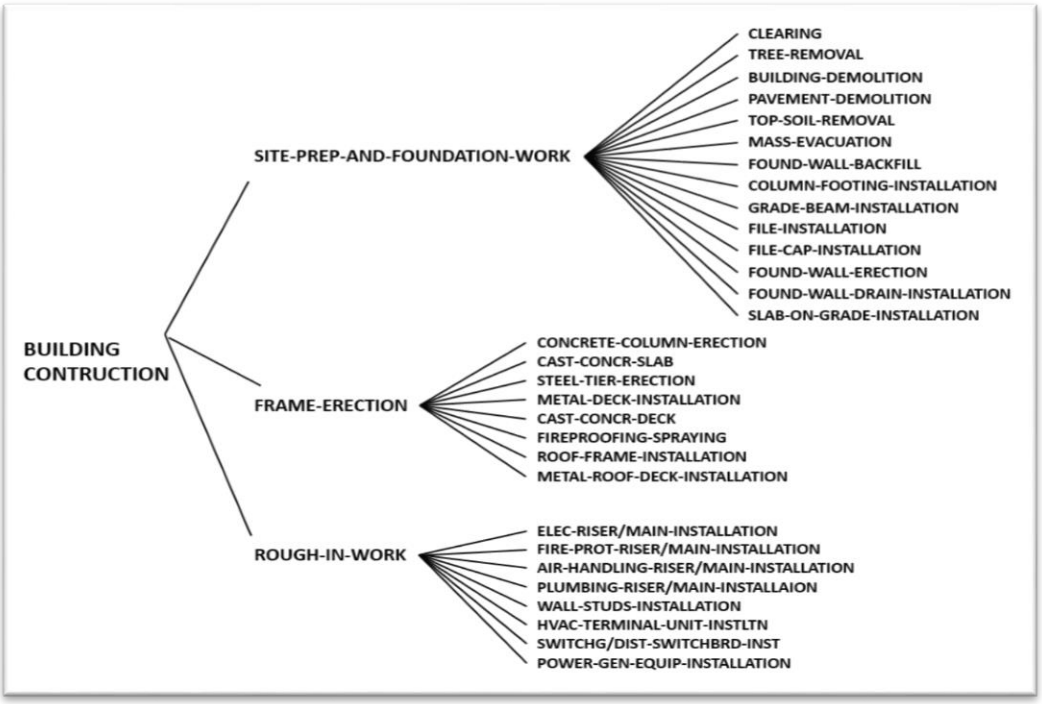


Figure 5 - Construction Sample WBS

GUIDELINE 2 – DEFINE THE PROJECT OBS

IDENTIFY THE PROJECT ORGANIZATIONAL STRUCTURE, INCLUDING THE MAJOR SUBCONTRACTORS, RESPONSIBLE FOR ACCOMPLISHING THE AUTHORIZED WORK, AND DEFINE THE ORGANIZATIONAL ELEMENTS IN WHICH WORK WILL BE PLANNED AND CONTROLLED.

PURPOSE OF THE GUIDELINE

Once the scope of work has been adequately defined through the WBS, it is important to assign responsibility for getting the defined work accomplished. This Guideline requirement serves to ensure that the contractor reviews staffing availability and the availability of his managerial personnel to ascertain to what extent these personnel have the time and the capability to assume responsibility for additional contract work.

MANAGEMENT VALUE OF THE GUIDELINE

The task of composing an organizational chart (or Organization Breakdown Structure) to identify which managers in the corporate structure will have responsibility for work accomplishment will usually suffice as a review to ensure that full management and technical capability exists. Where management, labor, or technical capacity is not sufficient, the contractor must choose between the options of subcontracting for this additional capability or hire additional personnel as a means of increasing capacity. Such a make-or-buy decision is often a hard choice to make because of the far-reaching effects it may have on the growth potential of the company, the company's overhead posture, and the competitive environment in which the company operates. The necessity to identify organizational responsibility cannot be minimized. Done improperly or insufficiently at the onset of a contract, it almost always results in lack of management control, lack of scheduled accomplishments, and cost overruns.

IMPACT OF NONCOMPLIANCE

Failure to define the responsible organization hinders the effectiveness of project execution.

QE LOI DISCUSSION

2.A.1. DOES A SINGLE OBS EXIST THAT CONTAINS ALL OF THE RESPONSIBLE ORGANIZATIONAL ELEMENTS NECESSARY TO EXECUTE THE PROJECT TO INCLUDE MAJOR SUBCONTRACTED AND INTER- ORGANIZATIONAL WORK?

The OBS identifies those managers in the contractor's organizational structure that are responsible for executing a specific scope of work consistent with their internal organizational structure of departments, units, teams, and/or subcontractors. When designating the internal organization responsible for managing the project efforts, the contractor must assign a manager with sufficient authority and responsibility to ensure performance of the authorized work. The CAM may report directly to the PM (a flat 2 level example) or there may be intermediate level functional managers who report to the PM (a multi-tiered OBS example). The PM's authority, senior leadership, and indirect and accounting authority, although not necessarily in the OBS must also be demonstrable.

The OBS and related organizational charts are living documents. Over time, people change positions. Each month the OBS should be reviewed for currency and adjusted as necessary. This also is documented in the RAM or other documentation as discussed in guideline 5. Where a contractor does not typically have a project internal organizational chart, the project should

document the equivalent as the basis for the OBS and, at a minimum, have a coding structure that provides the hierarchical relationships of personnel within the project.

People performing work are organized to facilitate effective management, whether the organization is designed along project, functional, or matrix lines. To assign specific work responsibility to a specific organization, the WBS and organizational structure should be integrated with each other (i.e., functional responsibility is established for managing specified work to produce defined products). The OBS is consistent with the project organization structure. This is opposite of the WBS which is product oriented and scope based. These two structures are integrated with each other in Guideline 5 to create the Control Account.

IMPACT OF NONCOMPLIANCE

Failure to define the responsible organization hinders the effectiveness of project execution.

GUIDELINE 3 - INTEGRATE SUBSIDIARY MANAGEMENT PROCESSES

PROVIDE FOR THE INTEGRATION OF THE PLANNING, SCHEDULING, BUDGETING, WORK AUTHORIZATION AND COST ACCUMULATION PROCESSES WITH EACH OTHER, AND, AS APPROPRIATE, THE PROGRAM WORK BREAKDOWN STRUCTURE AND THE PROGRAM ORGANIZATIONAL STRUCTURE.

PURPOSE OF THE GUIDELINE

This guideline exists because of the necessity to integrate all of the project's processes with each other and, as appropriate, with the WBS and OBS structures.

IMPACT OF NONCOMPLIANCE

The existence of a faulty data collection system weakens not only management control of the contractual effort but also provides the opportunity for the management subsystems to be less than fully integrated. Where this fault occurs, the integration of cost, schedule, and technical parameters is not well established and calls into question the usefulness of the EVMS data.

MANAGEMENT VALUE OF THE GUIDELINE

The basic necessity for the integration of the contractor's management subsystems listed above is an obvious one, but one which cannot be overlooked because of its obvious nature. It is imperative that at any time a contractor be able to provide traceability and a complete audit trail for any increment of work through the various management subsystems. From a work package activity in the IMS, to the specific WBS element, to the work authorization document (WAD) where the work scope is formally defined and authorized, to the OBS where individual responsibility is assigned, all authorized project work must be accounted for and documented.

QE LOI DISCUSSION

3.A.1. ARE THE PLANNING, SCHEDULING, BUDGETING, WORK AUTHORIZATION AND COST ACCUMULATION SYSTEMS INTEGRATED WITH EACH OTHER VIA A COMMON CODING STRUCTURE AND AS APPROPRIATE WITH THE WORK BREAKDOWN STRUCTURE (WBS) AND THE ORGANIZATIONAL BREAKDOWN STRUCTURE (OBS) AT THE CONTROL ACCOUNT LEVEL (AT A MINIMUM) THROUGH THE TOTAL PROJECT LEVEL?

The integration of documented EVMS processes and operating procedures will enable consistent and relatable performance data across the enterprise management. This integration is obtained through the development and consistent use of a unique coding structure (work order/job order/task code charge number structure) that facilitates the linkage among and between the EVMS planning, scheduling, budgeting, work authorization, cost accumulation, performance measurement and change control processes.

A fundamental requirement for the EVMS is consistency between separate and interdependent financial and management systems. Unique coding structures typically taken from a combination of WBS and OBS alpha-numeric designators (work order/job order/task code charge number structures) that are established by the contractor will support the transfer of data and allow the performance data derived from one system or process to relate to and be consistent with the performance data of other systems at the CA level and total contract level. The resulting integration

of technical/performance, cost, and schedule data enables contractor PMs to effectively manage and control the execution of the authorized work scope. The EVMS must consider and adequately integrate subcontractor performance data.

Data at the same WBS and OBS level should be reported consistently between the subsystems. For example; if a discrete WP is behind schedule in the IMS, it must be behind schedule in the EVM Cost Tool. The accounting structure must be integrated with the WBS at the WP or CA level of the WBS. The work authorization scope, schedule (or Period of Performance), and budget must be consistent with the IMS and the EVM Cost Tool. Date reconciliation between the baseline and forecast IMS and EVM Cost Tool are also a primary consideration of the requirement for integration. Baseline and forecast dates in the IMS must be within the same accounting month of the resources in the EVM Cost Tool. The same budget in the WAD should be consistent with the BAC reported in the IPMR/CPR external reports in column 15 and CBB totals.

IMPACT OF NONCOMPLIANCE

Failure to integrate data reported in subsystems invalidates the usefulness of reported earned value information. Inconsistent reports require independent verification of all of the information.

3.A.2. WHERE AN EIA-748 EVMS FLOW DOWN IS REQUIRED, IS SUBCONTRACTOR EVMS DATA RECONCILABLE WITH THE PRIME CONTRACTOR EVMS DATA, WITH ANY DIFFERENCES EXPLAINED IN THE IPMR/CPR FORMAT 5?

The prime contractor must ensure that the performance data incorporated from the subcontractor EVMS is consistent with the actual performance to date. This QE LOI does not imply that the prime contractor is required to report the same performance data submitted by the subcontractor, but that the prime contractor take special steps towards ensuring the performance data being incorporated be consistent and reflective of actual performance to date. Special steps are taken to consider performance data delays caused by accounting month differences. If prime contractor and subcontractor accounting calendars are significantly different, then the following steps apply:

- The subcontractor must provide schedule status on a monthly basis to the prime to facilitate the determination of project progress and the calculation of the project critical path that is reconcilable to subcontracted work;
- The subcontractor must report costs to the prime for the week ending that corresponds closest to the prime's accounting month-end and IMS date; and
- The subcontractor then carries the remaining period until their month-end as a part of next month's reporting.

A prime contractor is responsible for providing the necessary subcontractor performance oversight for the project. After careful consideration the prime contractor performs periodic assessments of all or portions of the subcontractor's work, including monthly BCWS, BCWP, and EAC values. For example, the prime may need to eliminate an inappropriate retroactive change reported by the subcontractor. Or the EAC may need to be higher because of some potential REAs from the subcontractor. In all cases the changes are documented and justified.

IMPACT OF NONCOMPLIANCE

Inaccurate and inconsistent subcontractor reporting is equivalent to lack of credibility in reporting to DOE the status of the project.

GUIDELINE 5 - INTEGRATE WBS/OBS TO CREATE CONTROL ACCOUNTS

PROVIDE FOR INTEGRATION OF THE PROGRAM WORK BREAKDOWN STRUCTURE AND THE PROGRAM ORGANIZATIONAL STRUCTURE IN A MANNER THAT PERMITS COST AND SCHEDULE PERFORMANCE MEASUREMENT BY ELEMENTS OF EITHER OR BOTH STRUCTURES AS NEEDED.

PURPOSE OF THE GUIDELINE

The purpose of this Guideline is to determine responsibility for a specific scope of work and facilitate schedule and cost performance measurement in an EVMS. The intersection of the Work Breakdown Structure (WBS) and Organizational Breakdown Structure (OBS) establishes the control accounts which are the focal point for work authorization, performance measurement and management.

MANAGEMENT VALUE OF THE GUIDELINE

The first two Organization Guidelines require the contractor to define/organize the contract scope of work and to identify/or organize his managerial staff in a manner that can get contract work accomplished. This Guideline requires their integration in a manner that enhances performance measurement and management. The control account has been previously identified as the lowest-level focal point for management control of all contractual effort. It is the initiation point for performance measurement and management. Hence, this Guideline is requiring that the WBS should be integrated with the OBS at least to the extent that Control Account Managers (CAM) be assigned to their respective control accounts for purposes of performance measurement and management.

IMPACT OF NONCOMPLIANCE

Failure to define CAs properly can create ineffective management or increased cost. More than one CAM per CA indicates lack of authority over the CA. Failure to establish the responsibility, authority and accountability of the CAM indicates an ineffective EVM implementation. If the prime has not reviewed and approved a subcontractor's schedule status, the management of the subcontractor is suspect. This lack of management oversight may have adverse impacts on the successful performance of the project. CAs established at inappropriate levels impede the CAMs ability to effectively manage the CA.

QE LOI DISCUSSION

5.A.1. IS EACH CONTROL ACCOUNT ASSIGNED TO AN ORGANIZATIONAL ELEMENT DIRECTLY RESPONSIBLE FOR THE WORK AND IDENTIFIABLE TO A SINGLE ELEMENT OF THE WBS?

The intersection of the WBS and the OBS represents where the CA is established. That intersection is necessary to understand the assigned responsibility for managing, controlling, and facilitating the allocation of resources to the work scope and permits cost accumulation and performance measurement. There may be one or more responsible organizations supporting a single WBS or multiple CAs within one OBS element. Generally, this occurs when the work within a WBS element must be segregated for management control purposes that are driven by scope and exit criteria (i.e., completion of the effort). Figure 6 reflects multiple CAs assigned to one OBS element. Managers need to consider the complexity of the work and the efficiency of the organization in establishing the CAs. This structured approach assists the contractor PM with assigning responsibility and

authority for performing the work scope contained in the WBS. Note: Labor, High Dollar Value (HDV) material, significant subcontracts, or LOE may be managed in separate CAs as required within the intersection of the WBS and OBS responsibility.

IMPACT OF NONCOMPLIANCE
Failure to define CAs properly can create ineffective management or increased cost.

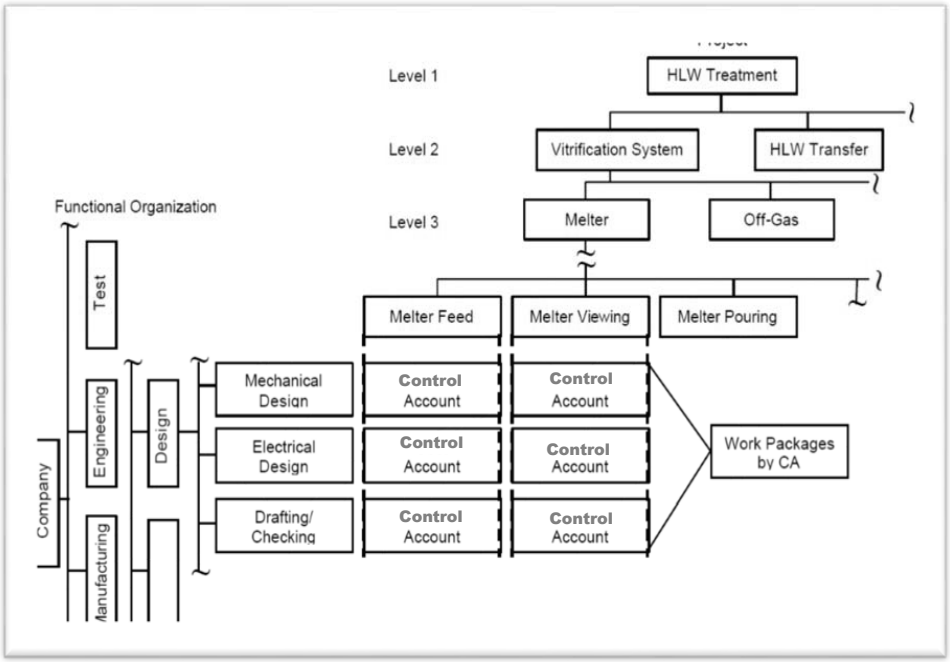


Figure 6 - WBS and OBS Integration and Control Account

5.A.2. IS THERE ONLY ONE CAM ASSIGNED TO EACH CONTROL ACCOUNT?

For the CAM to have sole responsibility, only one CAM can be identified to a CA. This establishes responsibility and authority for the accomplishment of the work scope defined in the CA.

IMPACT OF NONCOMPLIANCE
More than one CAM per CA indicates lack of authority over the CA.

5.A.3. DOES THE CAM HAVE RESPONSIBILITY, AUTHORITY, AND ACCOUNTABILITY FOR THE WORK SCOPE AND PERFORMANCE OF THE CONTROL ACCOUNT?

The CAM needs to be in a position recognized for having the responsibility, authority, and accountability for the performance of the CA. Contractors may be organized in different ways leading to the following scenarios:

1. Single project for entire contractor organization. In this case, the contractor's organization is the same as the project organization. CAMs have either direct authority over their labor force

or their functional management (if applicable) supports them and it is recognized that the CAM has supervisory authority. This authority is typically demonstrated in an organizational chart and means the CAM has operational authority over the resource(s).

2. Matrix management. The project is supported by functional organizations and the CAM is the interface between the project and functional organizations. This role is referred to as an Integrated Project Team (IPT) lead. In this case, the CAM reports to "two bosses". The CAM reports to the contractor PM regarding his project specific responsibilities and reports to their functional manager for other responsibilities. A CAM may be full time on a project or have additional responsibilities outside the project. This reporting responsibility depends on the size of the CA(s) for which they are responsible and how the contractor is organized. In a matrix environment, the labor executing the work scope does not report directly to the CAM, but the CAM provides the operational direction necessary to accomplish the work. Typically, the CAM has the ability to work with a higher level of functional management regarding staffing requirements and any personnel performance issues.
3. Subcontracted work. If a prime CAM is assigned responsibility for the work of a subcontractor and they do not directly manage the subcontractor's resources, they must work with the subcontractor regarding the services being furnished. Prime CAMs responsible for the subcontract must validate subcontractor performance monthly including but not limited to schedule performance, schedule critical path, BCWP, EAC, and Variance Analysis. Prime CAMs are responsible for submitting their best assessment of performance in the prime IMS and EVM Cost Tool status.

The CAM can delegate authority to lower levels to assist with managing and status progress of the CA. In this case, the CAM may have a technical supervisor reporting to him/her who has other personnel reporting to him/her for their daily direction.
Regardless of any Work Package Managers, CAM still should have a thorough working knowledge of the technical details of the CA, which includes schedule, resources, budget, work status, EACs, baseline control, and the like. If the CAM cannot demonstrate responsibility, authority, and accountability, the OBS and WBS should be revisited to define the CA at a level where this can be demonstrated.

IMPACT OF NONCOMPLIANCE

Failure to establish the responsibility, authority and accountability of the CAM indicates an ineffective EVM implementation.

5.A.4. HAS THE PRIME CONTRACTOR CAM REVIEWED AND APPROVED THE SUBCONTRACTOR′S EVMS STATUS AND IS IT ACCURATELY REFLECTED IN THE PRIME′S EVMS?

The prime contractor has responsibility for the entire project work scope, including the subcontracted effort. Normally, the prime contractor will assign a CAM to manage the subcontracted effort. Some subcontracted effort may be part of the work scope of a CA that also uses in-house resources. Depending on the contractual relationship between the prime and the subcontractor, status is conducted (by the prime or sub) and incorporated into the prime's monthly report to DOE. In either case, the CAM is responsible to ensure that the budget, schedule, performance, analysis, and EAC are accurate. If the CAM disagrees with a subcontractors' measurement of progress, the CAM must document the discrepancy and report progress as accurately as possible based on their

assessment. The approval or disapproval should be documented in accordance with company guidelines.

IMPACT OF NONCOMPLIANCE

If the prime has not reviewed and approved a subcontractor's schedule status, the prime's management of the subcontractor is suspect. This lack of management oversight may have adverse impacts on the successful performance of the project.

5.A.5. ARE CONTROL ACCOUNTS ESTABLISHED AT APPROPRIATE LEVELS BASED ON THE COMPLEXITY OF THE WORK AND THE CONTROL AND ANALYSIS NEEDED TO MANAGE THE WORK EFFECTIVELY?

A CAM may be responsible for more than one CA. The key is that the CAM must be able to demonstrate effective control of the CA(s). The larger the staff and the more CAs that are open at the same time means the CAM, all other factors equal, has more difficulty demonstrating effective control. There are no dollar/span of management thresholds limiting a CAM's responsibility. A CAM's technical background, experience, and time devoted to the CAM responsibilities are the only limits/factors that guide how many and the scope of CA(s) for which one CAM can be responsible. Generally, unopened future CAs are not the same concern as open CAs.

IMPACT OF NONCOMPLIANCE

CAs established at inappropriate levels impede the CAMs ability to effectively manage the CA.

3.0 PLANNING, SCHEDULING, AND BUDGETING

The focus of the Planning, Scheduling, and Budgeting category is to develop plans and strategies to achieve the desired program/project cost, schedule, and technical objectives. This focus includes the identification of short- and long-term resource needs. The ten guidelines (6–15) that comprise this category set the foundation for integrating scope, schedule, and budgets into a baseline against which accomplishments will be measured. This baseline, called the Performance Measurement Baseline (PMB), is a dollarized time-phased plan established primarily at the control account level and reflects how the contractor intends to use its resources, including subcontractors, to accomplish all the authorized work (Guidelines 8 and 9). The PMB provides the government and the contractor a common reference point for discussing program/project progress and status (Guideline 15).

Integral to establishing the PMB and critical to the success of any program/project is the use of a fully integrated, networked schedule (Guidelines 6 and 7) that establishes and maintains a relationship between technical achievement and progress status. The schedule provides visibility into the accomplishment of the activities required for execution of the contractual scope of work and is the basis for creating the PMB. The schedule structure should also correlate with the information in the Integrated Master Plan (IMP), when the IMP is contractually required. The IMP is an event- based plan consisting of a hierarchy of project events with each event being supported by specific accomplishments, and each accomplishment associated with specific criteria to be satisfied for its completion. The IMP is normally part of the contract and thus contractually binding (see Appendix B. Definitions and Appendix C. References).

The Integrated Master Schedule (IMS) is required for any EVMS contract/project. The IMS is a fully integrated, top-to-bottom project schedule that incorporates all levels of schedules into one. The building of predecessor and successor logic relationships at the working level, i.e., a networked schedule, is required to ensure that contractual and program/project events are completed in a timely and logical manner. Whatever approach to scheduling is chosen, there must be both vertical integration (from detailed activities to top level) and horizontal integration (across activities at the same level). In general, the IMP can be thought of as the top-down planning tool and the IMS as the bottom-up execution tool for those plans.

Developing a baseline schedule, measuring performance against it, and estimating when remaining activities will start and/or finish are essential elements of good schedule management. Equally important is the meaningful analysis of project schedules that provides the project team with a rational basis for decision making in order to meet project objectives. Schedule analysis is the process of assessing the magnitude, impact and significance of actual and forecast variations to the baseline schedule and/or current operating schedule. It begins with the calculation of the project's critical path and determination of any change in the completion date of the project. Schedule analysis also includes diagnosing the health of the project schedule and its direction by examining elements including schedule accuracy, integration, realism, performance, variances, trends, forecasts, "what-ifs," risk and relationship to resources.

For the schedule risk assessment to be successful, the network schedule must be developed and maintained appropriately. A thorough examination of the network should be done to ensure that the schedule is functional. This requires the identification and characterization the full range of schedule issues. The contractor should demonstrate that the scheduling technique meets the

minimum requirements of scheduling as defined in EIA-748 and is consistent with the contractor's written Earned Value Management System Description and operating procedures. EIA-748 employs a networked scheduling technique to verify attainability of project schedule objectives, and to integrate the project schedule among all related components. The network should link all project milestones, events, work packages and activities in logical cause and effect sequences to determine the required time needed to complete the project. Strings of linked predecessor and successor activities constitute 'paths' through the network. The Critical Path Method (CPM) of scheduling is traditional and well accepted by industry for developing the logic (or execution strategy) of the schedule. More often than not, the contractor will modify the strategy several times until the network is sound and the sequence of work flow is correct.

The DOE G 413.3-7, Risk Management Guide, states the purpose of the quantitative risk analysis is to provide budget and completion date estimates that include the effects of the project risks and other project uncertainties using statistical modeling techniques such as Monte Carlo analyses or other similar methodologies. Schedule Risk Analysis (SRA) is a recognized industry best practice which identifies the high risk areas of the project, determine the likelihood of risk materializing, and assess the impact of possible risk. The inclusion of uncertainty provides more complete information to evaluate the likelihood of finishing work on time and within budget. The initial assessment should begin as soon as the project baseline is implemented. A well-executed SRA process can provide the essential strategies for recognizing, reducing and/or eliminating possible risks, with the specific emphasis on project schedule risks. The SRA uses statistical techniques in the form of Monte Carlo simulations to identify technical, programmatic and schedule risk in a project and quantifies the impact of those risks on the project's schedule. Risk analysis determines the likelihood of risk materializing, assess the impact of possible risk, and more importantly, compiling the information and opportunity to mitigate risk long before it impacts the project. Standard output reports, products, and threat / opportunity correlation information is followed by action strategies for risk mitigation and tracking.

The EIA-748 EVMS Guidelines further establish the planning parameters associated with the PMB including:

- Establishing the Contract Budget Base (CBB), including authorized unpriced work. (Guideline 8). An allowance is made for a portion of the CBB to be withheld outside of the PMB as Management Reserve (MR) for internal management control purposes.
- Using MR to provide the contractor with a budget to manage risk within the established contract scope (Guideline 14).
- Using Summary Level PPs (SLPPs) for effort that cannot yet be detail planned at the CA level (Guideline 8).
- Authorizing work and identifying significant elements of cost (labor, material, other direct costs) (Guideline 9).
- Partitioning CA work scope into WPs for near-term effort and/or PPs for effort outside the current planning window (Guideline 10).
- Applying the most appropriate earned value measurement technique (EVT) to ensure progress reported against the PMB provides reliable performance data (Guidelines 10 and 12).
- Ensuring the budgets of WPs and PPs sum to the total budget authorized for that CA (Guideline 11).
- Ensuring the PMB includes overhead budgets (Guideline 13).

- Using Undistributed Budget (UB) as a holding account for contractually authorized work scope and budget that has not yet been assigned to an organizational element at or below the Work Breakdown Structure reporting level, either directly to CAs or SLPPs. Because UB is budget tied to specific work scope, it is part of the PMB (Guideline 14).
- Lastly, the guidelines emphasize maintaining the integrity of the PMB by ensuring the sum of lower level budgets does not exceed the total time-phased PMB and that all internal project budgets and management reserve reconcile to the contract target cost, which is the CBB (Guideline 15).

GUIDELINE 6 – SCHEDULING WORK

SCHEDULE THE AUTHORIZED WORK IN A MANNER WHICH DESCRIBES THE SEQUENCE OF WORK AND IDENTIFIES SIGNIFICANT TASK INTERDEPENDENCIES REQUIRED TO MEET THE REQUIREMENTS OF THE PROGRAM.

PURPOSE OF THE GUIDELINE

This Guideline requires that scheduling procedures be developed and followed as a means of documenting, in writing, the complete schedule plan of work.

MANAGEMENT VALUE OF THE GUIDELINE

The schedule should consist of master and summary level schedules and related subordinate schedules which provide a logical sequence from the summary to the detailed work package levels. In so doing, the schedules can provide for the interdependent sequencing of all work authorized on the project in a manner compatible with the contract milestones and technical requirements. The end goal of the scheduling hierarchy is that it provides a vehicle for evaluating actual progress (in time) against established planning points of achievement identified in Guideline 7.

Once satisfied with the schedule, but before work has begun, the contractor should (1) save an original "target baseline" copy of the schedule in order to maintain an orderly and controlled and documented record of associated project milestones, events, and activities, and (2) prevent arbitrary changes. The project schedule should clearly display the target baseline to represent the activity's original start and completion date. Since no project of any dimension ever runs its full course without encountering some change, the project schedule should display revisions to the original target baseline to represent the new or modified activity's start and completion date.

IMPACT OF NONCOMPLIANCE

Schedules communicate the project timeline necessary to accomplish the technical scope and facilitate establishment of the PMB, evaluation of progress, and forecasts of completion dates for remaining work. Avoiding delays is a top priority for contractor PMs; without exception, a poorly conceived project leads to crippling delays, consuming thousands of labor-hours and millions of dollars.

6.A. SUBSECTION - SCHEDULE ARCHITECTURE

The IMS is an integrated, networked schedule containing all the detailed discrete work packages and planning packages (or lower level tasks or activities) necessary to support the events, accomplishments and criteria of the IMP (when the IMP is contractually required).

The IMS represents a model of the activities planned to execute the project work scope. All the project work scope is found in the IMS with the possible exception of level of effort (LOE) activities that are supportive in nature and have no measurable output or product that can be discretely planned at the WP level (reference Guideline 12 for further LOE discussion). To obtain a logical assembly of events and tasks or activities, the scheduling process should be designed to permit the evaluation of both the sequence and the interrelationships of contractually specified work. The discrete activities are time phased and sequenced, accurately reflecting how the work is to be performed. Predecessor and successor relationships link the activities together to facilitate the timing and order in which the activities are conducted. The IMS contains project milestones, events, decision points

as well as external dependencies. External interfaces that may impact the project schedule must be shown as predecessors or successors to activities in the project. Following the completion of the IMP, the scheduling process is further expanded using a top down, bottom-up iterative approach to increase the number of events and tasks or activities by members of the project team, who retain the highest level of knowledge needed to appraise the time horizons for the completion of the work. This approach is especially effective at the work package task or activity and planning package level where tighter controls makes more extensive planning and observation of work necessary.

The traceability between the various levels of schedules are designed to ensure that technical milestones, tasks, or activities represent the completion of either all or part of a work package, are time integrated at ascending schedule levels, and terminate at a corresponding next higher level schedule critical decision or other major milestone.

Subcontracts should be incorporated at a level necessary to support the calculation of a realistic critical path and float values. For subcontracts without EIA-748 EVMS flow down requirements, the level of subcontract integration should be at the same level as if the work was performed internally.

Once the project schedule is completed and approved, it becomes a formal control document. Consequently, any changes to the project schedule's baseline must be formally documented and approved following the contractor's internal operating procedures. The IMS should be directly traceable to the IMP and should include all the elements associated with development, production or modification, and delivery of the total product and project high-level plan. If contractor schedule margin is used, it should only be used immediately preceding a DOE Critical Decision milestones such as CD-4 and should (scope issue) be reflected in the baseline as well as the status schedules. DOE schedule contingency is optional and if used should be represented as an activity, clearly defined in the activity name as 'DOE SCHEDULE CONTIGENCY' and placed after the contractor final delivery. During the execution of the project, activities are created to mitigate known or discovered risks. As part of the risk management process these mitigation activities are incorporated into the baseline and forecast schedules and documented via formal change control process or ETC/EAC forecast process.

QE LOI DISCUSSION

6.A.1. DOES THE IMS REFLECT ALL AUTHORIZED, TIME-PHASED DISCRETE WORK TO BE ACCOMPLISHED, INCLUDING DETAILS FOR ANY SIGNIFICANT SUBCONTRACTED EFFORT AND HIGH DOLLAR VALUE (HDV) / CRITICAL MATERIALS?

The IMS is the project plan for accomplishment of all project goals and deliverables. All of the discretely measurable work scope found in project documentation, including subcontracted effort must be accounted for in the IMS. The work breakdown and coding structures enable a project to be divided by level into discrete groups of activities, resources, costs, and materials for planning and controls purposes.

This IMS ensures that the relationships between activities in WPs, PPs and SLPPs have been thought out and represent the manner in which the project will be executed. There may be different

documents representing the scope of work contractually required on the project. The work scope may be found in a Project Execution Plan (PEP), Statement of Work (SOW), Performance Work Statement (PWS) or other work statement or ancillary documents depending on the practices of the DOE customer organization. While work scope designated LOE is not required to be part of the IMS, its inclusion is advantageous in achieving related resource planning requirements because of its supportive nature and the fact it has no measurable output or product. HDV material must be planned in the IMS with consideration of the baseline purchase request date, purchase order date, the receipt date, and requirement link to where used within the project as applicable. In other words, where the material is required in the project and impacts the labor performance. This requirement is for when the material procurement is in the detail planning period. This level of detail is not required for PPs; however, PPs for HDV material should be unique so they can still be visible in the IMS.

While a project schedule defines the scope of the work to be undertaken and the timetable for completion, it is the coding structure schema that ensures the planning, scheduling, budgeting, work authorization, and cost accumulation management subsystems are integrated such that the data derived from one system is relatable to and consistent with the data of each of the other systems. The proper integration of the contractor's management processes ensures the information and performance data retrieved from the EVMS is accurate, reliable, timely, and auditable (Guideline 3). In addition to having descriptive names, other activity identifiers within the project schedule must be consistent with the project work scope. Activity names that describe the effort and completion criteria help the contractor's PM/CAM easily identify the work scope, identify the scope to be performed, and provide an accurate status.

IMPACT OF NONCOMPLIANCE

Without having all the authorized scope included in the IMS, work scope may not get completed and the critical path may be inaccurate and not useful as a management tool.

6.A.2. DOES THE IMS CONTAIN PROJECT MILESTONES, PROJECT EVENTS, KEY PROJECT DECISION POINTS AND EXTERNAL DEPENDENCIES THAT ARE LOGICALLY LINKED WITHIN THE NETWORK SCHEDULE/IMS TO SUPPORT CRITICAL PATH ANALYSIS?

The traceability between the various levels of project schedule are designed to ensure that milestones and activities that represent the completion of either all or part of a work package are time integrated at the ascending schedule levels and terminate at a corresponding higher level schedule milestone.

The IMP depicts the overall structure of the project including critical milestones and events. It should define accomplishments and criteria for the successful completion of each critical milestone or event. The IMP is the contractor's event based plan for accomplishing the SOW or PEP. The IMS is a networked, multi-layered schedule generated by the contractor that begins with all identified IMP events. The IMP events, accomplishments, and criteria are duplicated in the IMS and detailed activities are added to depict the steps required to satisfy each criterion.

In the event an IMP is not contractually required, the principles should be implemented. An Event is defined as high level maturity point. In DOE this is typically CD-1, CD-2, CD-3, and CD-4. Accomplishments are the generally 5-10 things at a high level that when complete indicate the event is complete. The Criteria are the steps that prove the accomplishment has been finished. By

having the schedule hierarchy in this fashion it shows the schedule is based on accomplishing the mission of the project. The IMS should be directly traceable to the IMP or to the CD milestone structure more commonly employed in DOE contracts. The result is a fully networked, "bottom-up" schedule that supports critical path analysis. Driving paths may use different project events, deliverables, or the project end item (such as CD-3) depending on the reason for calculating and identifying the path(s) with the least amount of float. The Critical Path for the project is defined as the longest path of related incomplete tasks in the logic network from 'time-now' whose total duration determines the earliest project completion. It is always calculated through the end milestone of the project, typically CD-4. Significant project events, external dependencies, and decision points must be reflected in the IMS to facilitate the planning and execution of work scope.

Figure 7 shows the single numbering schema that enables traceability through the project schedule. Each activity should be associated with a unique alpha-numeric code used to organize and filter the activities into categories as necessary to confirm a complete scope of work to requirements documents. For example,

- Significant Accomplishment and Success Criteria is typically written in past tense to signify what accomplishment at complete, i.e. structure erected.
- Activities are typically written using action verbs, present tense to signify what actions are required to achieve the Success Criteria.
- Work package activities pertaining to the Success Criteria 'Steel Floor Structure Erected' for the start of the Project Event 'Building Construction Complete' with a WBS identifier '5.1.1' would contribute to a single numbering code that would be reflected in the contract (C0000).
- The alpha-numeric code would read 'C0000-5.1.1'.

This coding scheme can be expanded to reflect the organization or trade group 'AA' that has been given the responsibility for the work and would read 'C0000-AA-5.1.1'.

Combining the IMP alpha-numeric numbering system with the WBS creates a single numbering schema that enables traceability through the project schedule (IMS).

IMPACT OF NONCOMPLIANCE

Failure to link the schedule to all required milestones and external dependencies means the IMS will not provide accurate dates needed to develop a useable critical path for managerial analysis and decisions

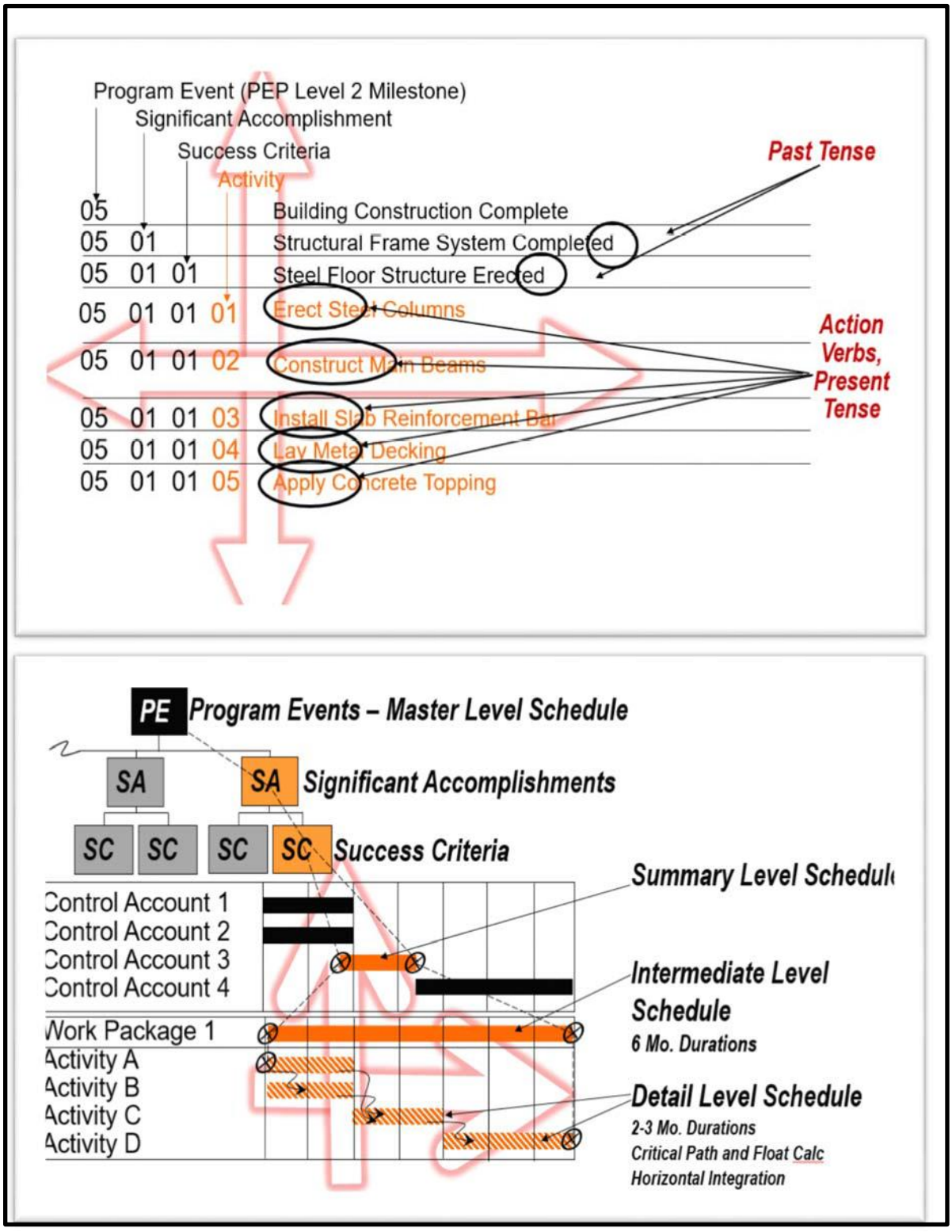


Figure 7 - Single Numbering Schema

6.A.3. IS SCHEDULE MARGIN (IF ANY) IDENTIFIED, LOGICALLY PLANNED, AND IN THE BASELINE AND FORECAST IMS?

Schedule margin is an optional technique used to act as a buffer for unforeseen events that could cause a schedule delay. If schedule margin is used in the IMS, whether modeled using a SVT activity or constrained milestones creating a gap, it must be clearly identified in the IMS. To ensure clarity, the activity name contains the text "Schedule Margin." It should also be assigned to a code field to support filtering requirements of schedule analysis.

Schedule Margin (SM) is used to mitigate schedule risk. The amount of SM established is directly related to management's estimation of schedule risk inherent to accomplishing the project goals and deliverables. The relationship between SM and risk in the schedule must be documented and available for review. A risk register is a common repository for the project to document risks and the relationship to schedule margin. SM may also be established based upon the results of a formal Schedule Risk Assessment. The EVM SD establishes the policy for the development and maintenance of Schedule Margin with details provided in the Risk Management Plan, IMS Supplemental Guidance or other project documentation. If SM is used, it must be located in the IMS as a single activity or gap between the last discrete activity in a critical decision phase and a critical decision milestone (such as CD-3 or CD-4). This placement will allow the entire project to influence SM and allow management to evaluate the impact of realized risks on the schedule to the CD milestone and take action to address the risks and impacts of the risks.

SM is established during the planning stages of the project to address the impacts of risk to the contractor's ability to complete the work on time and to meet contractual deadlines. Therefore, SM is baselined in the IMS to represent the project's schedule reserve to meet the schedule completion date. The duration of the SM in the baseline and forecast schedule should be equal at the start of the project, or the start of the CD phase it supports. However, as time progresses and the IMS forecast is updated, the SM may be changed at the direction of the contractor PM. SM may be consumed (over time) in the forecast schedule with monthly changes documented in the IPMR/CPR Format 5 report. This analysis should take into account the rate of consumption of SM compared to the percent complete of the project. If the percentage of the SM consumption is higher than the project percent complete, it may be an indication that the risks to the project are greater than anticipated. If the SM is totally consumed, it should still be reflected in the schedule with a duration of zero, indicating the SM has been consumed. The duration of the SM task may be reduced at the direction of the contractor PM. It may be reduced to zero days of duration over the course of the project based on risk impacts and managerial actions. The SM baseline is under change control requirements; however, changing the forecast SM duration is not subject to change control.

IMPACT OF NONCOMPLIANCE

A baseline without SM has a low probability of success. Without schedule margin in both the baseline and forecast schedule, management does not have the tools necessary to address and mitigate risks to the schedule.

6.A.4. ARE SIGNIFICANT AND PROBABLE RISK MITIGATION STEPS INCLUDED IN THE PRIME'S BASELINE AND FORECAST SCHEDULE, AND DO THESE STEPS ALIGN WITH DEFINED MITIGATION ACTIVITIES IN THE RISK REGISTRY?

Once the PMB has been established it is essential that contractor PMs take the appropriate steps to identify, examine, and assess potential risks in the baseline schedule. The creation of a networked-based schedule is an important feature of a contractor PM's ability to visualize the number, kind, and sequence of tasks or activities needed to execute a complex project. Risks that require mitigation are documented in the Risk Register and include those activities chosen to mitigate the risk in the baseline and forecast schedule through the BCP process. Because the probability and impact of some risks are greater than others, it is up to the contractor PM to establish thresholds that determine which risks are significant enough to have risk mitigation. All significant and authorized risk mitigation activities added to the baseline (and associated forecast) schedule must be processed through a formal change control process. Once included in the project baseline schedule, the risk mitigation activities in both the risk register and schedule must align. However, there may be risks found in the risk register that are not found to be significant enough to be planned in the project baseline schedule.

IMPACT OF NONCOMPLIANCE

Risk mitigation activities in the project schedule that are not in alignment with the Risk Register means the risk has not been integrated and therefore those risks are not being managed.

6.A.5. DOES THE CONTRACTOR MAINTAIN AN IMS DATA DICTIONARY?

The IMS Data Dictionary contains all required global, Enterprise Project Structure and Project custom created user defined fields to filter, sort and group information in the schedule such as subcontractor activities, government furnished equipment, resources, issues, risks, etc.

The schedule is a tool that integrates many other pieces of information, such as the WBS and OBS. However, each contractor can use different schedule fields to meet the integration requirements. This QE LOI requires that a data Dictionary or map of what code fields the contractor is using for which purpose. The contractor's IMS Data Dictionary must identify and describe all of the code fields and values used in the IMS and how they are used to filter and group data in the schedule. This information is necessary for personnel and management at all levels to be able to read and understand the IMS data. There are typically thousands of activities in the IMS and the data dictionary is required to make sense out of the information. Changes to these code fields, such as the addition of new fields or the elimination of old ones are documented in the monthly IMS deliverable and IPMR/CPR Format 5 report as appropriate. Included in the contractor's IMS supplemental guidance are methods to separately identify and exclude select activities from certain filters and tests. Where additional non-budgeted activities are required to be placed into the forecast IMS for visibility and management control purposes, they should be isolated and have unique and separate designations and charge numbers assigned for the purposes of tracking and recovering costs. These additional activities must be separately identified in both the activity name and activity code field as either one of two types: SVT or Schedule Margin. Additionally, the use of activity or user defined code fields should be employed to identify critical, near critical and driving paths to CD milestones or other important delivery points in the project schedule and be based on the

calculation of the network. The designated fields employed by the contractor shall be described, documented, and maintained in the IMS Data Dictionary.

IMPACT OF NONCOMPLIANCE

Failure to define and maintain an IMS dictionary inhibits the both the contractor and customer from understanding the IMS content, emerging project issues and invalidates the schedule heath checks.

6.B. SUBSECTION - SCHEDULE CONSTRUCTION

The IMS is based on a hierarchical structure with the discrete and optionally LOE activities found at the lowest level being summarized to a Work/Planning Package level through the CA and then to the total project level. The IMS is expected to have more granularity in the near term with less detail moving towards the future.

The traceability between the various levels of schedules is designed to ensure that milestones and activities occurring at the work package level that represent the completion of either all or part of a work package are time integrated at ascending schedule levels and terminate at a corresponding next higher level schedule milestone. The number of schedule levels (or tiers) is a function of project complexity and size.

Typically, there are essentially four levels that make up the project schedule. They are: (1) Milestone, (2) Summary, (3) Intermediate, and (4) Detailed. See Fig. 6.

- **Milestone Schedule**
  A high-level schedule that displays key events of major importance defined both by the contractor and the PMA. Programmatic events are typically indicated using a solid [black] diamond symbol. Milestones are major events consuming zero calendar days.

- **Summary Schedule**
  The master schedule depicts top-level key events and milestones at the summary level of the WBS (for example, levels 1-3 of the WBS). It should be an integrated roll-up of the intermediate schedules (i.e., Vertical Integration).

- **Intermediate Schedule**
  Intermediate schedules include mid-level project activities and key milestones, which include all associated accomplishments of the project summary master, schedule, traceable to the WBS element as necessary to display work effort at the intermediate level of summarization (for example; levels 3-5 of the WBS as appropriately tailored). There may be several intermediate schedules that depict varying levels of detail of the WBS. The intermediate schedule should be an integrated roll-up of the detailed schedules (i.e., Vertical Integration).

- **Detailed Schedule**
  The lowest level of the network schedule and the foundation of horizontal and vertical schedule integration. It should include the detailed activities and milestones that depict the work scope that represent all work packages and planning packages identified in the contract Performance Measurement Baseline (PMB). It is developed and used as the blueprint for the day-to-day management and control of work by the CAM. Detailed schedules must

contain activity start and finish dates that are based on physical accomplishment and are clearly integrated with project level time constraints. Detailed schedules must consider all horizontal and vertical interdependencies between and among control accounts, work packages, planning packages and activities. Dependencies fall into one of two categories: (1) 'Internal' dependencies are dependencies between separate tasks entirely within the boundaries of the WBS element, and (2) 'External' dependencies are dependencies between tasks and tasks being managed outside the WBS element.

The contractor should demonstrate that the scheduling technique meets the minimum requirements of network scheduling to verify attainability of project schedule objectives and to integrate the project schedule among all related components. The network should link all project milestones, events, and tasks in logical cause and effect sequences to determine the required time needed to complete work. This technique facilitates the calculation of the project critical path. The critical path (CP) is the longest path of related incomplete tasks in the logic network from 'time-now' whose total duration determines the earliest project completion. A review of the calculated CP reveals those activities that are causing delays in accomplishing work and those activities that jeopardize the project timeline. This analysis helps management focus on these activities to develop workaround plans and seize opportunities. When activities in the project schedule are statused out of sequence, logic relationships may be broken and established with new or existing activities to best reflect the execution of work moving forward.

While the IMS may contain LOE activities, this type of work should not be associated with driving paths to an intermediate milestone or the project CP. The CP is considered reasonable when discrete work activities are tied together in a sequence that makes sense from a workflow standpoint. Activities in the detailed schedule must contain sufficient detail and consider work calendars and the availability and allocation of resources. While the project schedule defines the scope of the work to be undertaken and the timetable for completion, it is the coding structure schema that ensures the planning, scheduling, budgeting, work authorization, and cost accumulation management subsystems are integrated such that the data derived from one system is relatable to and consistent with the data of each of the other systems.

Subcontracted work is typically significant portions of project scope assign to another contractor to perform. The subcontracted effort may be fixed price, however, this does not affect how the subcontract should be integrated within the IMS. Subcontractors should be integrated at the level at which interfaces and performance measurement are required (with or without an EIA-748 EVMS flow down requirement).

SVTs represent the work in the IMS that does not have resource requirements or scope and therefore is not included as part of the contractor's PMB cost, but is related to and may potentially impact the project schedule activities. Examples include customer review of documents, site work performed by other contractors before work can begin, wait times for RFP responses, and material shipping durations. SVTs must be identified in the schedule with "SVT" in the activity name, along with a description of the SVT activity. The inclusion of a value in an activity code field is not required, but is helpful in separating out SVTs from other activities during filtering, grouping and schedule health assessment exercises. SVTs should have a contractor task owner and have their status updated as required, generally with outside consultation (as they represent outside project effort). When employed correctly, SVTs provide the reason for a delay in an IMS. They also provide the expected (Baselined), updated forecast and actual durations as the schedule forecast moves in time. The

impacts of the SVTs are based on logical predecessor and successor relationships in the IMS. Because they are visible and contain activity names, SVTs are a preferred alternative to lags in the IMS, where documentation on the rationale for the lag is usually hidden from view, if it exists at all.

QE LOI DISCUSSIONS

6.B.1. DOES THE NETWORK SCHEDULE/IMS DESCRIBE THE SEQUENCE OF WORK (HORIZONTAL INTEGRATION) AND CLEARLY IDENTIFY SIGNIFICANT INTERDEPENDENCIES THAT ARE INDICATIVE OF THE ACTUAL WAY THE WORK IS PLANNED AND ACCOMPLISHED AT THE LEVEL OF DETAIL TO SUPPORT PROJECT CRITICAL PATH DEVELOPMENT?

A comprehensive IMS plays a crucial role in ensuring that a project scope, time, and cost can be tracked and monitored. To ensure success, scope of work must be clear, activity durations realistic, and resources assigned for accomplishing the work must be appropriate. Dependencies and logic between activities provides visibility as to how delays in one activity could impact future activities, and potentially the entire project to be delayed. Without the identification of dependencies and subsequent logic relationships, it is difficult to know how delays on individual activities will ultimately affect other related activities in later stages of the project. The IMS network establishes a logical sequence of work that leads through key milestones, events, and/or decision points to completion of project objectives. The schedule network is a model of how the project will accomplish the goals and deliverable reflected in the contract. The granularity of both the baseline and forecast schedule must be sufficient to promote a clear understanding of the work tasking at the work performance level. This means the detailed activities must be planned in a sequence the way they will be worked. All activities in the schedule should have both predecessor and successor relationships, with the exception of logical external receipts or deliveries including the project start and end. These relationships define in what order work will be performed. The logical sequence of design and construction work package activities and planning packages in the project schedule from start to finish must reflect a strategy capable of meeting the scope specifications and requirements and indicative of how the project will be built and cost. Additionally, all activities and milestones should be baselined to provide the ability to measure changes in time from the plan to the current forecast schedule.

The logical sequence of design, construction, Decontamination and Decommissioning (D&D), and Remediation type capital asset projects must reflect how the site will be improved and success is measured. Activity level relationship and interdependencies (i.e., key hand-offs) must be indicative of the actual way the work is planned and accomplished at the level of detail to confirm that the critical path is valid. For example, work in connection with an electrical system cannot be concealed or covered until such work has been inspected and approved before drywall work is initiated. In this example a Finish to Start (FS) relationship must be used to accurately reflect the actual way the work is accomplished. The IMS should identify the project critical path—the path of longest duration through the sequence of activities with the least amount of total float. Establishing a valid critical path is necessary for examining the effects of any activity's slipping along this path. The project critical path determines the project's earliest completion date and focuses the team's energy and management's attention on the activities that will lead to the project's success. Changes to the forecast critical, near critical, and driving paths shall be documented and explained from one month to the next. The schedule delivered to the customer must be consistent with that utilized by the contractor.

Activities associated with Requests for Equitable Adjustments (REAs), emerging work. and work arounds not already in the baseline schedule may be added to the schedule within the freeze period or beyond through the BCP process as defined in the contractor's EVMSD. See Revisions section for further details.

IMPACT OF NONCOMPLIANCE

Incorrect, excessive, or missing logic links may invalidate the usefulness of the critical path. This would cause artificial variances and the EVMS reporting would be suspect.

6.B.2. IS THERE VERTICAL SCHEDULE INTEGRATION, (I.E., CONSISTENCY OF DATA BETWEEN VARIOUS LEVELS OF SCHEDULES (INCLUDING SUBCONTRACTOR AND FIELD LEVEL SCHEDULES) AND DO ALL LEVELS OF SCHEDULES SUPPORT THE PROJECT SCHEDULE REQUIREMENTS?

The traceability between the various levels of schedules is designed to ensure that milestones and activities occurring at the work package level, which represent the completion of either all or part of a work package, are time integrated at ascending schedule levels and terminate at a corresponding next higher level schedule milestone. The number of schedule levels (or tiers) is a function of project complexity and size.

The detailed schedule is the lowest level of formal scheduling and is developed and used as the blueprint for the day-to-day management and control of work by the CAM. Each schedule level must support the next higher level. There may be additional levels that must also be vertically integrated. Detail schedules such as field level and like supplemental schedules are not required to be in the IMS but must also vertically trace to the IMS. Subcontractor schedules must align vertically, regardless of the implementation method chosen to represent them in the IMS. HDV material procurement and delivery information in the IMS must align with information in other sources, such as a material tracking database.

Horizontal and vertical traceability demonstrates:

- The schedule is rational;
- Has been planned in a logical sequence;
- Accounts for the interdependence of detailed activities;
- Provides a way to evaluate current status.

IMPACT OF NONCOMPLIANCE

If lower level schedules do not support the WPs, PPs and project goals and deliverables in the IMS, the project team is working to different schedules, defeating the usefulness of the IMS as a management tool.

6.B.3. ARE LEADS AND LAGS MINIMIZED AND JUSTIFIED IF EXCESSIVE?

Relationships with excessive lead or lag time should be avoided in the IMS. If relationships with large lead or lag times cannot be avoided, they must be explained. A Lead is the amount of time of the overlap between where a successor task begins and a predecessor task completes. A Lag is the amount of time between the end of a predecessor task and the beginning of a successor task.

The classic example is a three-day lag between pouring the concrete and ability to be able to build upon it. The three-day lag is a missing activity of the concrete curing. Typically lags represent fixed relationship based on laws of nature, or an external event outside the scope of the project. In all cases, lags can be modeled using a SVT activities. Lags >22 days require justification. Neither leads nor lags may be used to manipulate or manage dates within the IMS.

IMPACT OF NONCOMPLIANCE

Excessive Lags or use of Leads impact the creditability of the meaning of the critical path.

6.B.4. DOES THE IMS MINIMIZE THE USE OF CONSTRAINTS?

Date constraints are anything that limits or restricts a task or activity, or group of tasks or activities from happening until a preceding event takes place. Hard constraints prevent logic in the network from driving the schedule. An activity may slip, but the impact of the slip will not be accurately reflected if a hard constraint is restricting the movement of other related activities in the schedule network. The project end date requires a hard constraint to calculate float values and run a critical path.

All use of hard constraints, if any, should be justified in a text field in the IMS and defined in the IMS Data Dictionary. Of special note is the mandatory constraint type. This constraint is designed to break logic to achieve its assigned date. It is recommended to avoid the use of mandatory constraints in the IMS. In P6 the following are considered hard constraints:

- Mandatory Start or Finish
- Finish or Start On or Before
- Start or Finish On

Soft constraints are defined as constraints that affect the early pass of the schedule. In other words, they inhibit activities from moving closer in time based on status. Soft constraints are most commonly used to model resource restrictions or provide material or subcontractor delivery dates. Normally they should be justified and less than or equal to 15% of the incomplete activities. Soft constraints in P6 are defined as:

- Start and Finish After,
- As Late as Possible

IMPACT OF NONCOMPLIANCE

Hard constraints and excessive use of soft constraints do not allow the schedule network to accurately represent the impacts of schedule slips.

6.B.5. IS THE SCHEDULE BROKEN INTO SHORT BASELINED DISCRETE ACTIVITIES IN THE DETAILED PLANNING PERIOD?

The natural subdivisions of the control account furnish both the Project Manager and Control Account Manager a blueprint according to the way the work will actually be accomplished.

The control account is broken down as much as possible into short-term discrete units of work called work packages. Work packages are the basic building blocks developed and used by the Control Account Manager for detailed planning and control of contract performance. A work package is

normally divided into tasks or activities. From a network-based scheduling and performance measurement perspective, it is important to keep the tasks or activities that make up a work package relatively short in duration (i.e., no more than 44 working days) to reduce the problems associated with calculating the network and determining the amount and value of completed in-process work. While all contractual effort is planned and controlled through the control account, most contractors recognize that it may not be practicable or possible to do grassroots planning for an entire contract. Taking this limitation into account, budgets are detailed and planned for a maximum of six months using the control account work package. Budgets beyond this time frame are recorded on the control account-planning package. Visibility for good planning is highest closest to the data date. Farther out into the future, less information may be available and specific information to help CAMs plan activities in more detail may not be available. Planning in the near term is expected to be clear and detailed in short activities (no longer than 44 working days in duration) so that effort required to perform the task and completion criteria is very easy to understand.

Planning beyond the near term may be less detailed, usually assigned to PPs, but still in support of project milestones and deliverables. For many projects the fiscal year may be the planning horizon. Scope that has not yet been authorized to a CA (SLPPs) may also be in the schedule farther beyond must be in support of project milestones and deliverables just like PPs. Activities, including those assigned to PPs and SLPPs must have predecessor /successor relationships as they are part of the schedule network and potentially on the critical path.

The intent of requiring that discrete schedule activities be no longer than 44 working days in the near term, detailed planning period is to define the level of typical implementation expected in the IMS. The IMS is required to contain all of the project discrete scope. Longer activities indicate missing scope. They also indicate a plan that delays progress assessments when problems occur. Short activities provide early warning capability. There is no intent to artificially constrain discrete tasks. Instead this requirement guides the expected level of discrete scope that meets the all scope included requirement. Since earned value is assessed and reported monthly and the schedule is statused monthly, that should logically be the level of fidelity in the IMS for only the detailed planning period.

At the choosing of the contractor earned value techniques can be captured at the activity level to further substantiate QBD for long duration work packages. These earned value techniques imply discrete work efforts and must be appropriate for the length of the work package. Under no circumstances can the length of an activity or the combination of activities be longer than their parent work package. QBDs are associated with earned value and are therefore required to be identified and reported at the work package level.

Actual progress of a task or activity from its start to its finish is determined using earned value measurement principles with time elapse consideration. The relationship between the amount of budgeted work accomplished (BCWP) and the amount of budget planned (BCWS) for the task must be weighed against the time for doing so. For tasks that are of relatively short duration, it is less important to track progress in such detail; but for tasks of an extended duration, indicating the technical percentage of the task that is complete helps track actual progress against the baseline plan.

Note: For the QE LOIs on schedule activity duration, work package duration, and float, exceeding the established thresholds does not result in an automatic CAR, but would rather trigger an assessment of the magnitude and any provided rationale and justification issues.

- Below the threshold: Compliant and no further related questions
- Within a factor of three greater than the threshold (i.e., if threshold 10% then < 30%): CAM follow-up discussions to see if reasonable.
- Beyond a factor of three greater than the threshold: This is likely a systemic issue and may result in stopping a review and requiring the contractor to fix these issues before the review can continue. This is typically a significant and non-justifiable issue that affects the overall integrity of the IMS.

IMPACT OF NONCOMPLIANCE

The lack of near term detail planning creates a baseline schedule that will not produce an accurate critical path leading to erroneous priorities.

6.B.6. HAS A PLANNING HORIZON METHODOLOGY BEEN IMPLEMENTED WITHIN THE PRIOR 12 MONTHS OR TO THE NEXT MAJOR PROJECT TECHNICAL MILESTONE OR CRITICAL DECISION GATE?

A reliable and efficient planning and scheduling process is essential in order to manage the project effectively. In a planning horizon setting, the frequency with which the project schedule is updated can have a significant impact on the project's stability, productivity, and costs. Hence, one of the important decisions in the design of a planning horizon strategy is the frequency of planning future work efforts. The planning and scheduling of work is often performed on some regular basis i.e. 6 months, year, next major milestone or event, etc. Thus, the baseline schedule most useful for the purposes of project management and performance measurement is the one most reflective of the current situation that is incrementally developed following a rolling horizon basis. In practice, the project schedule would be based upon the current workflow execution strategy and then after a set period of time would be updated by adding a greater level of detail to reflect changes of project circumstances. Maintaining a realistic baseline schedule in view of changing customer requirements, unforeseen suppliers or construction problems is a real and difficult proposition for many projects. Therefore, to increase the relevance of the project baseline schedule and performance measurement baseline, a planning and scheduling process following a planning horizon strategy becomes an important objective for actively managing cost and schedule constraints.

A rolling wave or block planning approach as a planning horizon methodology is defined as cycles of detail planning. These cycles are typically 6 months; although it is recommended that instead of time-based, the cycles should rather be based on project technical milestones within CD phases that are between 6-12 months apart. Within the rolling wave/block planning window, detailed work packages and their associated activities are planned with greater fidelity to allow for execution level detail. Beyond the rolling wave and block plan spans there are typically planning packages and/or SLPPs. LOE work packages are not required to follow the rolling wave cycles. To avoid needless work efforts and costs, the DOE FPD and other feds should be cautious to promote or require detail planning beyond the near term rolling wave/block planning period. It is very expensive to detail plan for periods beyond that, and typically, detail plans beyond one year are obsolete before they start.

Rolling Wave Technique: While all project effort is planned and controlled through the control account, most contractors recognize that it may not be practicable or possible to do grassroots planning for an entire project. Taking this limitation into account, budgets are typically detailed and planned for a maximum of six months using the control account work package. Budgets beyond this time frame are recorded on the control account-planning package. The transfer of planning package (or far-term) budgets into precise work package (or short-term) budgets typically start 30 days prior to the beginning of the next six month rolling wave planning period. This process is followed until all long-term budgets have been incorporated into a detailed plan. Prior to the completion of each rolling wave, the CAM, together with functional team members prepare a detailed schedule (or blueprint) for the use of staff-hours (or labor-dollars) needed to complete all activities within a six-month period.

Block Planning Technique: For Block Planning, budgets are typically detailed and planned to the next major project technical milestone or event. Typically, planning blocks range from between six and twelve months. Budgets beyond this time frame are recorded on the control account-planning package. The transfer of planning package (or far-term) budgets into precise work package (or short-term) budgets typically start 30 days prior to the beginning of the block. This process is followed until all long-term budgets have been incorporated into a detailed plan. Prior to the completion of each block the CAM, together with functional team members prepare a detailed schedule (or blueprint) for the use of staff-hours (or labor-dollars) needed to complete all tasks within a block of time. Advantage of Rolling Wave Planning:

- Ensure a discrete level execution plan that can be used by the entire project team to manage the work;
- Provides detail only for a short period that is well known;
- Ensures that the detail always exists into the future;
- Is cost effective as compared to the detail planning of the entire project.

IMPACT OF NONCOMPLIANCE

Lack of a detail plan inhibits the usefulness of the IMS and too much detail in the future is wasteful.

6.C. SUBSECTION - SCHEDULE MAINTENANCE

The baseline schedule represents the EVMS plan that has been established as a current model of the way the work scope will be executed. The forecast schedule is statused (typically monthly) to report progress (BCWP) against the baseline and also used to forecast future activity up to and including project completion.

For the IMS to produce meaningful results, the schedule must represent all work required to perform the scope of the project, the activities must have durations based upon the scope and resources required to perform the work, and all logical relationships must have assigned predecessors and successors to complete the integrity of the network of activities. To help model the schedule to real life impacts, several options are available in the scheduling toolset. One option, lags, is available to offset time between activities and milestones in the schedule network. However, lags, especially negative lags that are counter to the flow of time, are strongly discouraged as they may impact the accuracy of the critical path. Constraints place restrictions on either start or finish dates of activities and may impact the critical path accuracy as well. The schedule should be relatively free from

constraints allowing the network to reflect accurate schedule impacts. Constraints are useful to hold the project end date in place, but when used elsewhere, the critical path may be distorted. A single constraint placed on the end DOE deliverable will facilitate the development of a critical path, and allow accurate calculations of dates and float in the schedule.

As CAMs are responsible for the work scope, schedule, and budget within their respective CAs, they are expected to approve their portions of the IMS. Similarly, the PMs are responsible for the overall project and expected to approve the entire IMS. The IMS is a useful tool for prioritizing work. A good practice for this purpose is to have regular project meetings. Total float is the amount of time an activity can slip before the project end deliverable is impacted. Generally, float greater than 44 working days is considered high and raises the question whether the activity is linked to an appropriate successor.

- Completeness
  - Project schedule must reflect the entire discrete scope of work including critical subcontract efforts.
- Realism
  - Project schedule must account for work calendars, the chronological order of workflow, logical task interdependencies, duration estimates that consider resource allocation and availability, and delivery points.
  - Ground rules and assumptions for developing the schedule are clearly defined and documented.
  - Project schedule is properly updated, is current and relevant.
- Reasonableness
  - Schedule specified for a project must present a feasible or reasonable plan for the sequence and duration of the work.

The idea that what gets measured gets attention, particularly when values are tied to the measures, accurately, and succinctly describes the process used to status work. It highlights the need and opportunity to expose threats. The availability and interpretation of information are central to this process. Here, the transformation of data into information is a value-added process. The added value comes from giving decision-makers only the data they need when they need it. Equally important to creating information is the method for disseminating it. Schedules are statused at least monthly and more often if the contractor (PM decides to do so. This process provides a consistent reporting period that the contractor submits to the DOE. The status date reflects when the status was determined and is the departure point for the schedule forecast. The baseline and status schedules are closely related as the status schedule was first derived from the baseline schedule. Project status must be easily reconciled to the baseline schedule in order to measure progress to the baseline. If there are significant differences between the two schedules, there is a question regarding the accuracy of the status as well as the forecast.

When the IMS is statused, float values may change and significant changes alert management to areas that may require attention. To ensure consistent reporting of progress (BCWP) and actual costs (ACWP), the month-end accounting period (commonly referred to as the cost processor date) must coincide with the schedule reporting period (schedule status date or Data Date). Completion criteria must be very clear. An example of this would be using activity names to describe completion criteria such as; ″complete soil compaction test number one.” Frequently, subcontractors represent a significant portion of the project. If this were the case, subcontractor schedules must be an integral

part of an IMS. The accuracy of these schedules is critical and the CAM or supply chain manager responsible for oversight of the subcontractor must review and approve these schedules.

QE LOI DISCUSSION

6.C.1. IF LOE ACTIVITIES ARE INCLUDED IN THE IMS, DOES THE CONTRACTOR ASSURE THEY DO NOT DRIVE, OR ARE DRIVEN BY THE DISCRETE WORK?

The contractor PM must ensure that the LOE relationships are appropriate. There is no requirement that LOE activities be in the project IMS. However, if included, LOE activities are never linked as a predecessor directly or indirectly to discrete activities. If LOE is in the IMS, ensure the relationships are appropriate and not tied to discrete activities in a way that would allow LOE activities to impact discrete effort date calculations, contractual event date calculations or place LOE activities on the critical path.

IMPACT OF NONCOMPLIANCE
Activities assigned the LOE EVT on the critical path mask project performance.

6.C.2. IS THE IMS TOTAL FLOAT REASONABLE FOR THE APPROVED SCOPE OF WORK?

The reason for this requirement is that float management is the number one tool to managing priorities. If the float is reasonable, then an early warning indicator is degradation of schedule float. It is important to identify and substantiate the sequences and relationships among tasks or activities necessary to complete the critical and near-critical (or low float) paths. Excessive total float (typically greater than 44 working days in the baseline schedule, 66 days in the forecast) in a schedule is an indication of inappropriate or missing relationships between activities.

Float is the impact to the next constrained milestone/task, typically a CD gate. There is a common misunderstanding of the importance of float for non-critical work. For example, risk tasks and 70% non-high risk that can be done any time it is important that originally non-high risk work be planned logically. This is to say that all discrete work is logically planned to show the baseline and forecast are executable. The real critical path if constructed with logical relationships can and will change over time. Float should be useful and reasonable on every activity in the IMS.

An important factor in determining the time required to complete the project is identifying a critical path. If a task is delayed on the critical path, then the project is delayed. Tasks or activities not lying on the critical path are more flexible. The difference between the time allowable for a task or activity and the time required to complete it is called float. Precedence defines task or activity sequencing order and how tasks or activities are related to one another in the plan. If one task or activity must be completed before the next task or activity can be started, the first task or activity has precedence over the second task or activity. Though some tasks or activities must precede others in the logical order of work, many tasks or activities can be started in parallel with other tasks or activities.

Excessive float indicates the schedule is not logically tied. It also may indicate the schedule is not defined to a detail level. Generally, when there is excessive float, several activities are found to have a common successor such a project completion that is a couple years away. While convenient, this successor is not likely to be the most appropriate logic tie and has created high float values. The litmus test here is the question: Can this activity slip "X" days (where "X" is the float value), and not impact anything in the project? Often times this question can be answered intuitively to provide guidance to a reasonable float value.

Negative float in a schedule indicates that activities and milestones cannot meet their required finish dates based on logic, duration, status and other impacts on the project. The more negative the float value, the larger the issue is for the elements of the schedule that must be recovered to meet their finish date requirements. Negative float in the baseline schedule indicates an unachievable plan and should be addressed whenever present. Negative float in the forecast schedule is more common and represents a call for action. As such, a recovery plan should be developed and implemented to address the condition. Persistent, unaddressed large negative float (greater than -10 days for 3 months or more) in the forecast schedule is an early indication of a potential missed delivery or event milestone achievement.
Note: For the QE LOIs on schedule activity duration, work package duration, and float QE LOIs., exceeding the respective thresholds of 44, and 66 days for high positive float and 0 and -10 days for negative float does not result in automatic CARs, but would rather trigger an assessment of the magnitude and any provided rationale and justification. Conditions that would warrant further discussion are as follows:

- Below the threshold: Compliant and no further related questions.
- Within a factor of three greater than the threshold (i.e., if threshold 10% then < 30%): CAM follow-up discussions to see if reasonable.
- Beyond a factor of three greater than the threshold: This is likely a systemic issue and may result in stopping a review and requiring the contractor to fix these issues before the review can continue. This is typically a significant and non-justifiable issue that affects the overall integrity of the IMS. QE LOIs.

IMPACT OF NONCOMPLIANCE
High or excessive float may be an indication of a schedule network that is not adequately defined or does not have accurate relationships between activities. This produces a work flow that may not be feasible and an inaccurate critical path. Negative float indicates an unachievable plan and should be addressed

6.C.3. DOES THE CURRENT SCHEDULE PROVIDE ACTUAL STATUS INCLUDING START AND COMPLETION DATES CONSISTENT WITH THE MONTH END STATUS (DATA) DATE FOR ALL DISCRETE AUTHORIZED WORK?

Project managers need to ensure that the information reported is accurate and consistent with the status period.

When the IMS is statused in accordance with the business cycle (no less than monthly), the process includes setting the status date (also known as the data date) to be the end of the reporting period. This will move the forecast of the remaining work to be completed to the right of the status date. There should not be activities that have not been started prior to the data date, nor should there be

actual start and/or actual finish dates after the data date. Additionally, activities should not be statused out of sequence based on the status of their predecessors. For example, a predecessor should be completed before a successor activity with a FS relationship should start. In reality, if the successor does start out of sequence, then the relationship is overcome by events and should be deleted in the status file and replaced with a meaningful predecessor and successor for each task. A task is zero percent complete when it has not yet begun, and it is 100 percent complete when it is finished. The contractor's scheduling system should indicate the remaining duration (i.e., time) the task will consume for the determination of technical progress.

IMPACT OF NONCOMPLIANCE

If the status date is not consistent with the status period, the schedule is not reporting accurate information.

6.C.4. ARE THE WORKAROUND PLANS REFLECTED IN THE FORECAST SCHEDULE, PLANNED IN SUCH A MANNER TO SUPPORT A REALISTIC CRITICAL PATH WITH THE FORECAST LOGICALLY REVIEWED, WITH CONCURRENCE BY CAMs, OTHER AFFECTED ORGANIZATIONS?

Workaround plans must be incorporated into the project forecast IMS and support the applicable WP and CA schedules (meaning associated with the effort causing the workaround).

Problems will occur over the life of the project. Some of the problems will require workaround planning. This includes rework and alternative sequencing. The activities representing workaround plans must be integrated into the schedule network following with a logical process to ensure the possibly revised critical path, near-critical paths, and driving paths are properly established. In effect, the workaround, when complete, is the path forward to mitigate a current problem within the forecast schedule. Workaround plans in the IMS typically result in more activities in the forecast schedule than the baseline. However, any differences need to be clearly linked back to the same control account and work package that the work around is supporting.

Before implementation, the potential workaround plans are examined for realism in terms of timing (what are the impacts downstream to work based on these changes), resources (are the needed resources available based on the new demands of the potential plan) and technical content (will these changes alter the technical goals or requirements). As such, the CAM is a significant partner to input realism in any workaround planning. A part of the workaround plan implementation involves changing the logical relationships between activities. A good check is to compare the new logic to the original baseline plan logic to verify the new changes are valid. While forecast logic changes are not normally subject to change control using internal budget change documentation (e.g., BCR), the CAM is still responsible for verifying the realism of the changes.

The analysis should explain changes to critical path or near critical path WPs and PPs (or lower level tasks/activities) from submission to submission as well as any changes to the IMP. The impact of critical path changes on major project milestones or other major schedule risk areas should also be discussed. Work around and/or recovery schedules/plans, and associated impacts caused by project changes should also be provided. The schedule narrative should address progress to date and discuss any significant schedule changes such as added/deleted work package(s), planning package(s) or task(s)/activity(s), any significant logic revisions, and any/all changes in programmatic schedule assumptions. Finally, the analysis should, if required, be able to forecast

future potential delays and/or potential problems. This type of analysis should be done as needed and provided to the customer and the project team to assist in the schedule risk management process.

IMPACT OF NONCOMPLIANCE
If workaround planning is not in the forecast schedule, the critical path is not realistic.

6.C.5. ARE BASELINE CHANGES TRACKED AND TRACEABILITY DEMONSTRATED?

In a dynamic environment with constantly shifting circumstances, it is crucial to control changes or revisions that impact the baseline. After a project is baselined, routine updates occur to both resource and schedule information. In addition to confirming start and finish dates, updates should be made to a task's remaining duration length and modifications to relationships (i.e., links) between tasks as and when necessary. The impacts of these changes should be immediately visible throughout the area of the network affected. Schedules are typically updated at the close of each monthly accounting period, and are the responsibility of the Control Account Manager (CAM). The CAM must control the changes or revisions that impact the baseline. As explained herein, the baseline represents the foundation on which actual accomplishments are measured. Any changes or revisions to the baseline are made only at the direction of the Project Manager, typically with concurrence from the government. Schedule changes follow a baseline change process that requires transparency regarding exactly what is changing. Documentation is required to reflect the schedule condition before the requested change and after the change and rationale providing management sufficient visibility when reviewing and approving the change**.**

IMPACT OF NONCOMPLIANCE
A schedule without traceability to the original may no longer be consistent with the approved scope of the project.

6.C.6. ARE RESOURCE AVAILABILITY AND CONSTRAINTS USED IN THE DEVELOPMENT OF DURATIONS FOR ACTIVITIES, WP, PP/SLPP?

Resources are how work is accomplished. For the IMS to be achievable, resources must drive WP, PP, and activity level durations. The EVMS process must consider the availability of personnel, facilities, and equipment to perform the defined work needed to execute the project successfully. Resource risk must be considered in the development of the IMS, including the effect of external factors such as loss of availability to competing work efforts or unexpected downtime that could preclude or otherwise limit the availability of the resources needed to complete planned work. It is vitally important to recognize that the quality of resource estimates affects the schedule risk, which includes the assumptions used for resource allocation for work items. See Figure 8. Resource requirements, availability, and hours should be considered in the determination of work package activity and planning package durations. It is important to ensure the type (i.e., trade group) and quantity of resources are identified and understood and not over allocated to avoid delays. For example, two plumbers for ten days, or ten plumbers for two days. Resource conflicts (over/under allocations) influences the project critical path and near critical path(s).

IMPACT OF NONCOMPLIANCE
An IMS that is not based on resource availability is not executable or realistic.

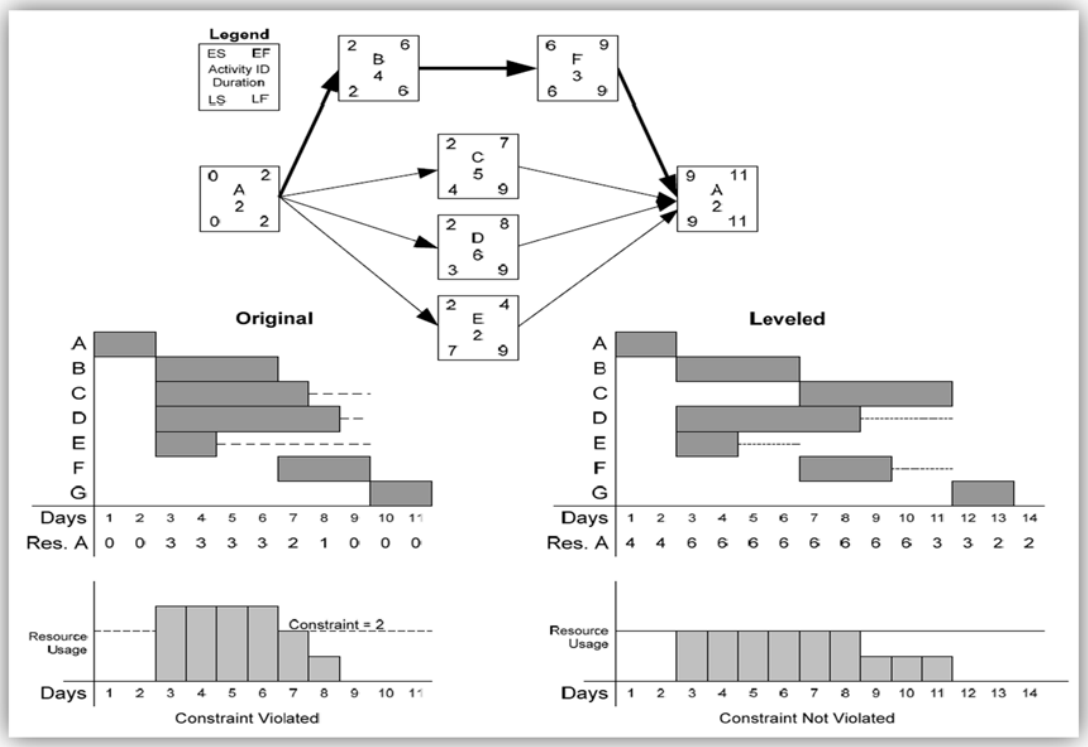


Figure 8 - Resource Allocation

GUIDELINE 7 - IDENTIFY PRODUCTS AND MILESTONES FOR PROGRESS ASSESSMENT

IDENTIFY PHYSICAL PRODUCTS, MILESTONES, TECHNICAL PERFORMANCE GOALS, OR OTHER INDICATORS THAT WILL BE USED TO MEASURE PROGRESS.

PURP OSE OF THE GUIDELINE

Identification of milestones within the schedule will make it possible to place an objective value on the amount of work required to meet that milestone goal, and, as work can be proven to have been accomplished, the contractor can proceed on to the next task in the scheduled sequence.

MANAGEMENT VALUE OF THE GUIDELINE

There is considerable dependence between Planning and Budgeting Guideline numbers 6 and 7. Guideline 6 requires sequential scheduling that will identify task interdependencies. Guideline 7 requires identification of interim goals by which to measure work accomplishment. Once the schedule is established the contractor should devise a methodology for tracking his actual accomplishment of that scheduled work. To avoid subjective guessing of work accomplishment, the conscientious planner (and systems reviewer) should ensure that these interim goals have been identified within all work schedules. The IMS must contain objective completion criteria to ensure progress is measured and reported accurately.

Completion criteria for activities and WPs must clearly indicate what constitutes completion. Naming conventions of activities play an important role in providing clarity to "what complete looks like". The detailed activities in the IMS, as well as interim milestones for longer duration WPs, provide objective indicators of progress. The use of redundant names for activities in the schedule is highly discouraged as clarity is greatly reduced and it creates confusions during the status cycle.

IMPACT OF NONCOMPLIANCE

Without identifying products and milestones within the schedule the project team will not be able to place an objective value on the amount of work required to meet a milestone goal and cannot track accomplishment of work against a goal. Missing technical performance goals in the IMS leaves management without visibility into the progress towards achieving project goals and completing on time.

QE LOI DISCUSSION

7.A.1. ARE MILESTONES, TECHNICAL PERFORMANCE GOALS, OR OTHER INDICATORS USED AS INDICATORS OF PROGRESS?

Milestones that could influence the IMS calculations have the appropriate predecessors and successor links established in the baseline and in the forecast schedule to provide management with the correct dates and paths.

As part of the contract between supplier and the DOE, key events, delivery dates and other milestones are negotiated and bound by the agreement between the two parties. The most visible of these goals are the Critical Decision milestones 1–4 on the project. As indicated in the following graphic (Figure 9), the CD milestones help define the boundary points between project initiation, definition, execution, and operations. The contract, PEP, SOW, Work Statement, and other

documents also identify other milestones that require effort to perform and therefore impact the IMS. These items may include document deliveries, reports, and other closure items signaling the completion of work. The IMP (or other event based plan) and IMS are used to tracking project technical and schedule status, including all significant mitigation efforts that support the risk management process.

The IMP is comprised of a hierarchy of project events, in which each event is supported by specific accomplishments, and each accomplishment is based on satisfying specific criteria to be considered complete. The IMS is an integrated, networked schedule containing all the detailed discrete work packages and planning packages (or lower level tasks of activities) necessary to support the events, accomplishments, and criteria of the IMP. From a schedule perspective, the time- based impact of technical performance progress measured through the use of Quantifiable Backup Data (QBDs) at the work package activity level must be considered in the IMS calculation. QBD are discussed in EIA-748 Guideline 10.

IMPACT OF NONCOMPLIANCE

Missing technical performance goals in the IMS leaves management without visibility into the progress towards achieving project goals and completing on time.

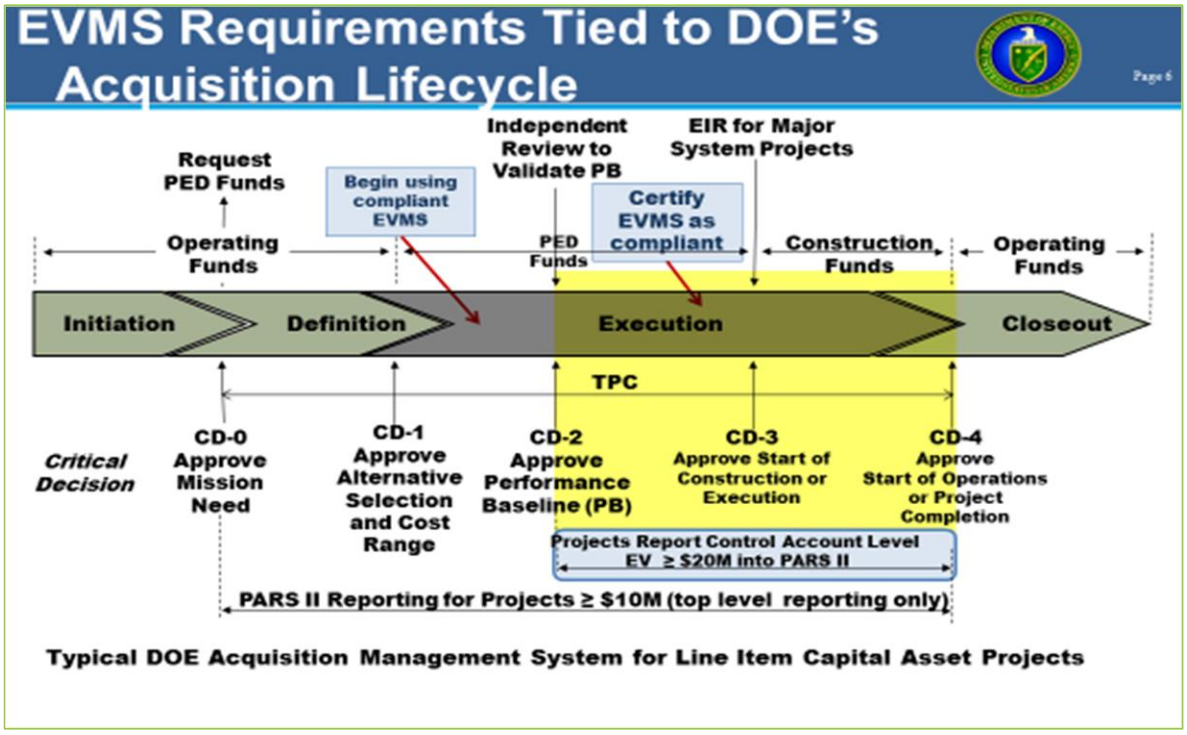


Figure 9 - EVMS Requirements – Source PM EVM Training Snippet 1.1

GUIDELINE 8 - ESTABLISH THE PERFORMANCE MEASUREMENT BASELINE (PMB)

ESTABLISH AND MAINTAIN A TIME-PHASED BUDGET BASELINE, AT THE CONTROL ACCOUNT LEVEL, AGAINST WHICH PROGRAM PERFORMANCE CAN BE MEASURED. INITIAL BUDGETS ESTABLISHED FOR PERFORMANCE MEASUREMENT WILL BE BASED ON EITHER INTERNAL MANAGEMENT GOALS OR THE EXTERNAL CUSTOMER NEGOTIATED TARGET COST INCLUDING ESTIMATES FOR AUTHORIZED BUT UNDEFINITIZED WORK. BUDGET FOR FAR-TERM EFFORTS MAY BE HELD IN HIGHER LEVEL ACCOUNTS UNTIL AN APPROPRIATE TIME FOR ALLOCATION AT THE CONTROL ACCOUNT LEVEL. IF AN OVER-TARGET BASELINE IS USED FOR PERFORMANCE MEASUREMENT REPORTING PURPOSES, PRIOR NOTIFICATION MUST BE PROVIDED TO THE CUSTOMER.

PURPOSE OF THE GUIDELINE

The purpose of GL 8 is to create a time-phased, resourced plan against which the accomplishment of authorized work is measured.

MANAGEMENT VALUE OF THE GUIDELINE

This plan must ensure resources for accomplishing the work are time-phased consistent with the planned work scope for all authorized work. This time-phased relationship between authorized work, time, and resources is referred to as the Performance Measurement Baseline (PMB). The government and the contractor have that common reference point, the PMB, for discussing project progress and success.

The accurate reporting of progress against a mutually recognized plan facilitates the implementation of actions by management to maintain or bring the project back on plan. The establishment of realistic budgets, directly tied to the authorized scope of work, is essential for each organization responsible for performing project effort. Also, the establishment and use of the PMB is indispensable to effective performance measurement and it should be in place as early as possible after contract award or Authorization to Proceed (ATP).

IMPACT OF NONCOMPLIANCE

An inaccurate PMB invalidates cost and schedule analysis.

8.A. SUBSECTION - PMB DEVELOPMENT

The Performance Measurement Baseline (PMB) is an integrated time-phased budget plan for the accomplishment of work scope requirements on a project having full alignment to resource planning and the project schedule (Fig. 10). The PMB includes any Undistributed Budget (UB) value that is not yet time phased (see Guideline 14) prior to its distribution. The PMB's time phased budget is more commonly referred to as the Budgeted Cost for Work Scheduled (BCWS).

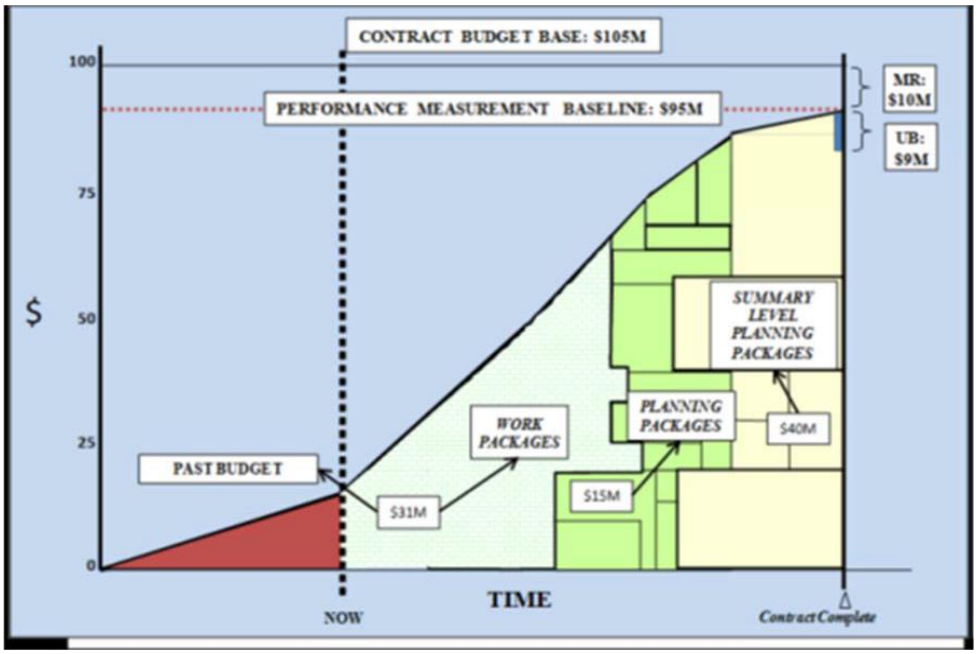


Figure 10 - Time Phasing the PMB

QE LOI DISCUSSION

8.A.1. ARE ALL OF THE ELEMENTS OF THE PMB (SCOPE, SCHEDULE, AND BUDGET) ALIGNED?

The PMB is the time-phased budget plan against which actual performance is assessed. The Contract Budget Base (CBB) value used to establish the PMB is tied to the current value of the contract, including any Authorized, Unpriced Work (AUW). The contractor must ensure that the resource plan is executable within budget and schedule constraints, and is realistic to achieve the contract scope. Additionally, the contractor must use current rates (i.e., approved, provisional, or proposed) when establishing the PMB. Control account budgets are time-phased consistent with the project schedule; material budgets are time-phased as appropriate; and subcontractor budgets are time-phased to support project schedule requirements.

The PMB, exempting UB, is the time phased budget plan that is comprised of SLPPs and CAs. SLPPs are for future effort that cannot be realistically identified to a CA. They are higher level planning accounts above the CA level that identify scope, schedule and associated budget, but have not been assigned to CAs. CAs are detail planned in WPs for the near term effort and planned in PPs for the far term effort (see Guideline 10). The PMB must be planned consistent with the baseline schedule dates and durations in the IMS for authorized work.

IMPACT OF NONCOMPLIANCE

An inaccurate PMB invalidates cost and schedule analysis.

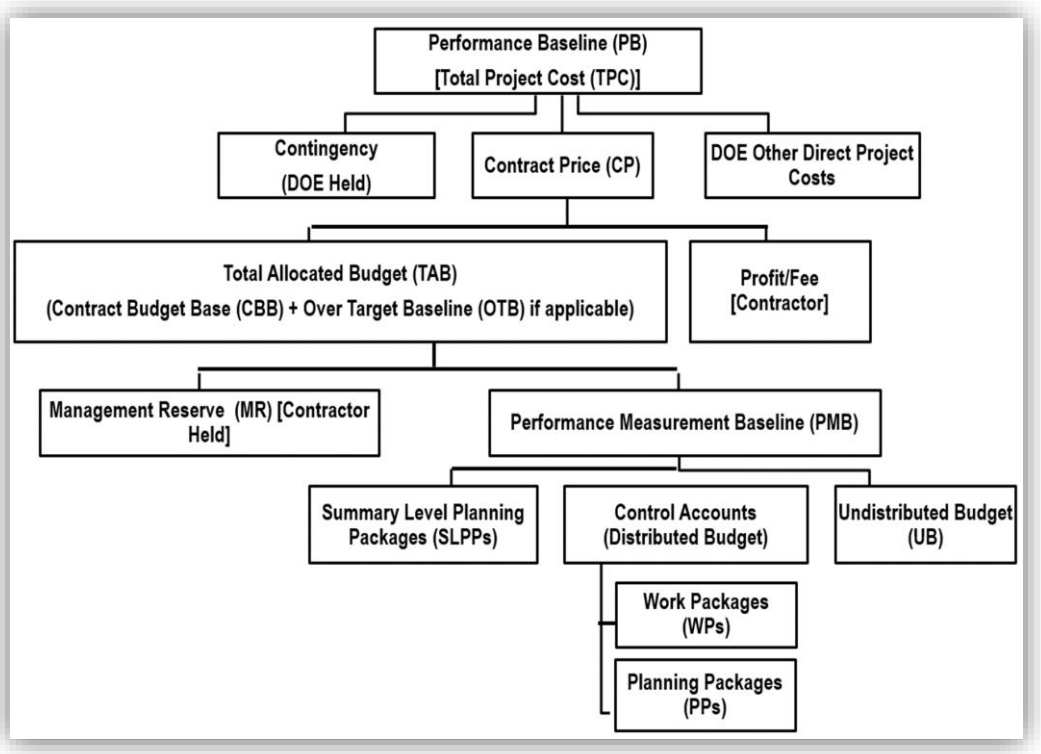


Figure 11 - Baseline Hierarchy

8.A.2. DOES THE PMB PLUS MR EQUAL THE CONTRACT BUDGET BASE? (IF AN OVER TARGET BASELINE IS IN PLACE DOES THE NEW PMB PLUS MR EQUAL THE TOTAL ALLOCATED BUDGET)?

One of the basic EVMS requirements is that the PMB plus MR equals the CBB (the project/contract value at cost). Once the PMB is established, changes to the scope, schedule and/or budget usually occur. See Figure 11 – Baseline Hierarchy.

For most contract changes, the need for the change is often time critical. When this occurs, the contracting officer may issue an undefinitized change order or Authorized Unpriced Work (AUW). This order allows the contractor to start the work while a proposal and contract modification are being negotiated. At this point in time, the TAB is equal to the CBB, which is now equal to the negotiated contract cost (NCC) plus the AUW. Once the modification is negotiated, the NCC, CBB, and TAB will all once again be equal.

During the life of a project, situations may arise whereby available budgets for the remaining work are insufficient to ensure valid performance measurement. Under these circumstances, a requirement may exist for the TAB for work to exceed the CBB. The resulting value is referred to as an Over Target Baseline (OTB). The TAB is now equal to the OTB. The establishment of an OTB does not change the CBB or NCC.

If the contractor recognizes that additional budget is necessary to accomplish the project goals and DOE approves, this budget may be added to the baseline to create the OTB. Note that it is the responsibility of the contractor to notify DOE via a request for an OTB and DOE must approve it before an OTB can be implemented. Prior to approving the revised PMB, it should be jointly reviewed by the contractor and the government to verify that it represents and achievable budget and schedule can be successfully executed. If DOE does not approve the OTB the contractor must reflect the additional costs as overruns without adjusting the CA budgets within the PMB. It should also be noted that an OTB is not a contractual action and the CBB value is not changed. Subcontractor EIA-748 EVMS flow down, where it relates to formal reprogramming, is the prime contractor's responsibility to approve and manage.

When the contractor and DOE are satisfied that the new baseline represents a reasonable plan for completing the work, the new baseline becomes the basis for future performance measurement. With an approved OTB the formula for the Total Allocated Budget (TAB) is TAB = CBB + OTB where OTB represents the value of the forecast overrun. The revised PMB would consist of the value of the original PMB plus the over target budget allocated to each CA. That value plus the MR should equal the new TAB. See Figure 12 to see OTB/OTS S-Curve and Format 1 reporting impacts.

IMPACT OF NONCOMPLIANCE

Failure to properly implement an approved OTB will result in a poorly integrated plan for performance measurement/management and an increased risk of failure in project execution.

8.A.3. DOES THE CBB RECONCILE WITH THE TOTAL PROJECT COST (TPC) AS APPLICABLE?

The CBB + Fee or Profit + DOE held Contingency + any other ODC = the Total Project Cost (TPC). The summary of these elements should be in balance at all times.

IMPACT OF NONCOMPLIANCE

Project would not be aligned with the authorized total project cost.

8.A.4. ARE CONTROL ACCOUNTS AND WPs OPENED AND CLOSED IN A TIMELY MANNER CONSISTENT WITH THE ACTUAL START AND COMPLETION AS STATUSED IN THE IMS?

As CAs and WPs are scheduled to begin, the CAs are authorized by the period of performance as documented in the work authorization and WP start dates. Similarly, a WP completion date supports the completion date of the CA. Actual cost charged to a CA after the CA has been closed is inconsistent and potentially understates both cost variance and EAC. When work is statused 100% complete, the applicable charge numbers for that labor scope should be closed (it is recognized the charge number may need to remain open for lagging costs ((estimated actuals reported) and/or rate changes for final yearend reconciliation). The CAM remains responsible for the current EAC until final closure. Except for CAM approved cost transfers, labor hours should not be charged to CAs with total performance completed.

IMPACT OF NONCOMPLIANCE

Resources are not aligned with project deliverables placing timely completion of project goals at risk.

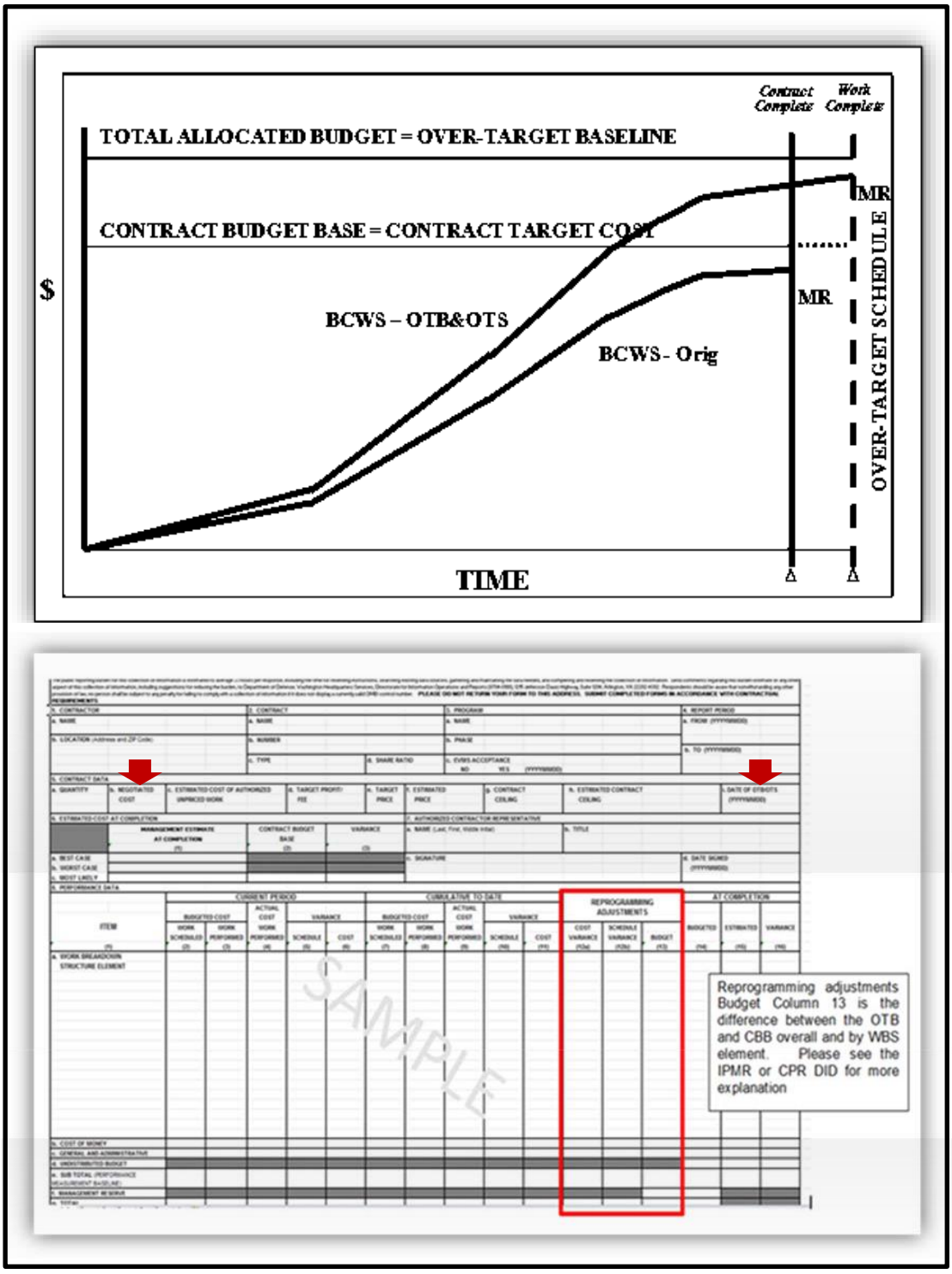


Figure 12 – OTB/OTS S Curve and IPMR/CPR Format 1, Column 13 Reprogramming Adjustments

8.A.5. IF AN OTB/OTS HAS BEEN APPROVED AND IMPLEMENTED, HAS THE WORK AUTHORIZATION DOCUMENTS BEEN MODIFIED TO REFLECT THE OTB/OTS VALUES?

When an OTB/OTS has been approved and implemented, the work authorization documentation for the affected CAs must be changed and approved to reflect the amount of the over target budget. Note: An OTB/OTS must be approved by the DOE Federal Project Director (FPD) in coordination with the designated DOE EVMS focal point and contracting officer before implementation.

IMPACT OF NONCOMPLIANCE

Failure to properly amend and approve the work authorization documentation will result in a poorly planned OTB/OTS and subsequent baseline.

8.B. SUBSECTION - SUMMARY LEVEL PLANNING PACKAGES (SLPPs)

Both PPs and SLPPs are logically linked in the IMS, however claiming progress (BCWP) against them is not allowed as they are not planned in detail. There may not be sufficient visibility to detail plan all the scope at the onset of the project. If the scope has been authorized to a CA, a planning package would be used to plan that segment of work that has not yet been divided into WPs. If the scope has not yet been authorized to the CA level, a SLPP can be used to plan the effort.

QE LOI DISCUSSION

8.B.1. DO ALL SLPPs, IF ANY, HAVE SCOPE, SCHEDULE, AND BUDGET DEFINED?

SLPPs are for future efforts that have not been identified to a CA. They are higher level planning accounts above the CA level that identify scope, schedule and associated budget (resources) through the end of the project. The budget for SLPPs must be based on resource requirements identified specifically to the work for which it is intended, be time-phased, as necessary, for accurate rate application, have its value periodically assessed, and have controls established to ensure this budget is not used in performance of other work. As with CAs, a responsible manager must be assigned to monitor and maintain these summary level efforts. SLPPs will be subdivided into CAs at the earliest opportunity. Planning horizons may be used to determine the appropriate time period in which to convert SLPPs into CAs. As work included in an SLPP draws closer to time-now, or as work definition becomes clearer, the contractor must convert the SLPP into CAs. This concept is a component of what is called the "rolling wave" approach to planning. The maintenance of realistic budgets, directly tied to an established scope of work, is essential for all project effort. Eventually, all of the work must be planned to the CA level prior to performance.

IMPACT OF NONCOMPLIANCE

Lack of scope, schedule, and budget integration invalidates the PMB.

GUIDELINE 9 - AUTHORIZE AND BUDGET BY COST ELEMENTS

ESTABLISH BUDGETS FOR AUTHORIZED WORK WITH IDENTIFICATION OF SIGNIFICANT COST ELEMENTS (LABOR, MATERIAL, ETC.) AS NEEDED FOR INTERNAL MANAGEMENT AND FOR CONTROL OF SUBCONTRACTORS.

PURPOSE OF THE GUIDELINE

Through a formal work authorization process, the budget's elements of cost (EOCs) required to execute the control account's scope of work are identified, planned, and documented.

MANAGEMENT VALUE OF THE GUIDELINE

Approved work authorization must precede the baseline start and actual start of work. No work shall begin before work is authorized by an initial work authorization. Formally authorizing the work ensures the assignment of project work scope to the responsible organization is clearly documented and the resources required for completing the work are budgeted and acknowledged by the management team prior to commencement of work. Budget is established for work scope that is then further planned by the EOCs for labor, material, subcontractor, and other direct charges required to accomplish it.

IMPACT OF NONCOMPLIANCE

Lack of planning by EOC results in poor resource plans and potential future resource conflicts.

9.A. SUBSECTION - WORK AUTHORIZATION

Establish budgets for authorized work with identification of significant cost elements as needed for internal management and for control of subcontractors.

QE LOI DISCUSSION

9.A.1. DO WORK AUTHORIZATION DOCUMENTS IDENTIFY SCOPE OF WORK, BUDGET BY ELEMENT OF COST, AND PERIOD OF PERFORMANCE?

The EVMS must demonstrate the tie between the negotiated contract dollar value and the various work authorization documents to ensure contract target costs are properly translated into the PMB.

Work authorization includes the control account relationship to the WBS element and responsible organization. An approved control account by way of the work authorization process is the contractor PM's vehicle to delegate responsibility for budget, schedule, and technical scope requirements to a designated control account manager. A budget is established for work scope that is then further planned by the EOCs for labor, material, subcontractor, and other direct charges required to accomplish it.

IMPACT OF NONCOMPLIANCE

Inadequate work authorization increases the risk of unauthorized work and cost overrun.

9.A.2. ARE WORK AUTHORIZATION DOCUMENTS CONSISTENT WITH THE OBS LEVELS OF RESPONSIBILITY?

Work authorizations must be integrated and flow through the OBS.
If the OBS defines intermediate managers between the contractor PM and the CAM, for example, work authorization is required from the contractor PM to the intermediate manager and from the intermediate manager to the CAM.

IMPACT OF NONCOMPLIANCE
Lack of integration between work authorization and the OBS means the work may not be assigned to the responsible manager and at the correct level for project performance.

9.A.3. DOES THE CONTRACTOR REQUIRE THAT WORK SCOPE, SCHEDULE, AND BUDGET ARE AUTHORIZED BEFORE THE WORK IS ALLOWED TO BEGIN AND ACTUAL COSTS ARE INCURRED?

Approved WADs must precede the baseline start and actual start of work. No work shall begin before work scope, schedule, and budget are formally authorized by WADs. This process is a control function to ensure that costs are controlled in a systematic manner.

See Guideline 28. For emerging work associated with Authorized Unpriced Work (AUW), at least partial authorization is required before work is performed and actuals are incurred. This authorization may be a week, a month, or longer as long as it has scope, schedule, and budget consistent with the interim authorization. Interim authorization may be approved by the contractor PM through a directive as long as it is replaced within several months with a formal work authorization that is also approved by the CAM. This process is to allow for authorization of emergency work consistent with the intent of earned value. However, no work may proceed without formal DOE authorization verbal or written, if new project scope is the result.

IMPACT OF NONCOMPLIANCE
Unauthorized expenditures prior to formal work authorization may result in cost overruns and work being performed out of sequence to the baselined schedule.

9.B. SUBSECTION - ELEMENTS OF COST (EOCs)

EOCs are a subset of the CA and WP budgets. Initially, the BOE was developed and broken out by EOC to provide enough detail for resource planning. EOC budgets found in the WAD are direct descendants from the BOE. EOCs may vary by contractor as they are controlled by company accounting practices.

QE LOI DISCUSSION

9.B.1. WITHIN CONTROL ACCOUNTS, ARE BUDGETS SEGREGATED AND PLANNED BY ELEMENT OF COST (E.G., LABOR, MATERIAL, SUBCONTRACT, AND OTHER DIRECT COSTS)?

Budgets for direct costs are those chargeable to a specific work package and include labor, materials, equipment, and any other resources defined by the project. The time-phasing of material budgets

should be consistent when the material is expected to be received and consumed. Budgets for subcontractors are time-phased to support project schedule requirements. (See Guideline 13 for establishing indirect budgets). Budgets may be stated in dollars, hours, or other measurable units consistent with the budget values reflected in the CAPs and the latest WADs. Figure 13 depicts the segregation by cost element.

IMPACT OF NONCOMPLIANCE

Lack of planning by EOC results in poor resource plans and potential future resource conflicts.

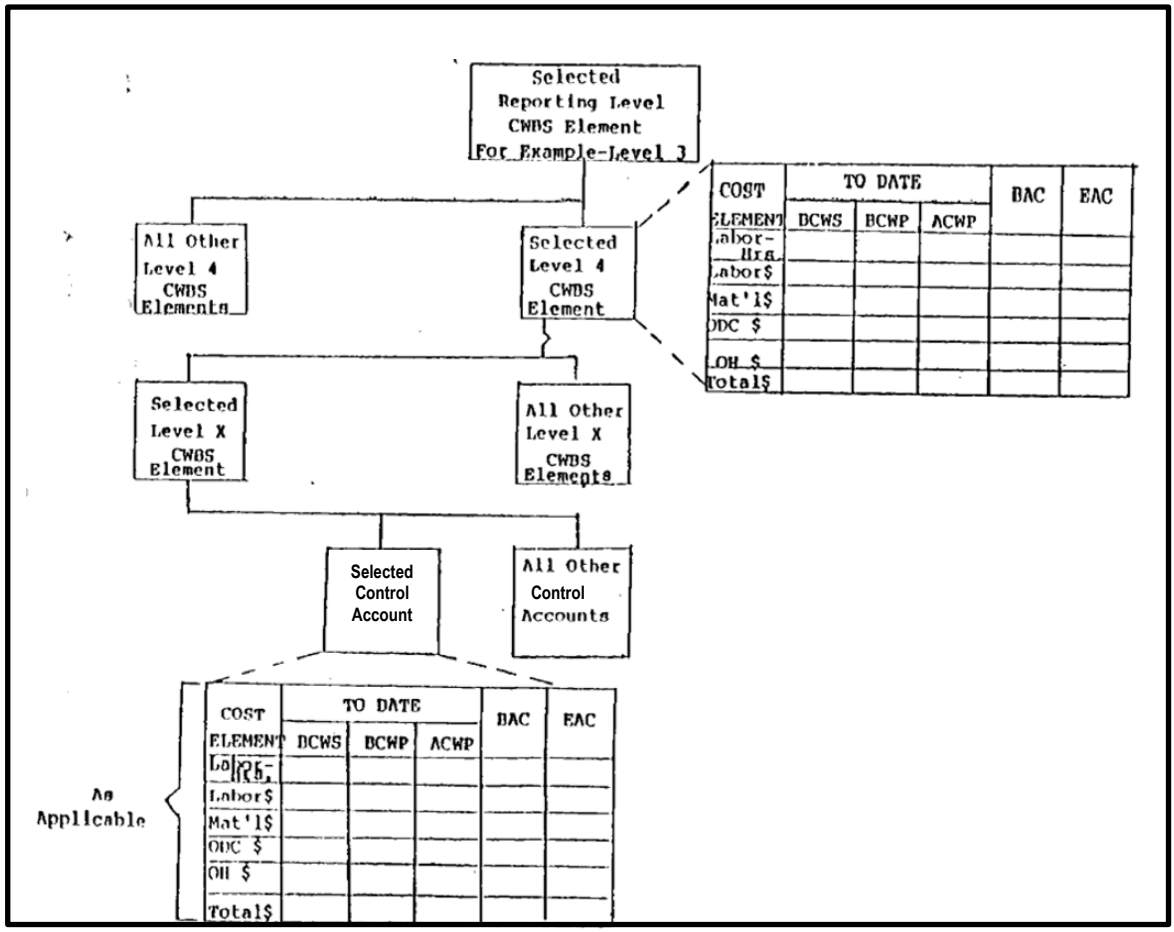


Figure 13 - Element of Cost Vertical Alignment

9.C. SUBSECTION - DOLLARIZED WP BUDGETS

The formal work authorization process extends from the project level to the CA. Budgets for WPs within the CA are the responsibility of the CAM. The BOE developed for the project during the proposal phase is typically used as the basis for development of the WP budgets as details by EOC are found in this document. The WP budgets plus planning package budgets (if any) must sum to equal the CA budget. Material and installed equipment budgets should be based on the defined and expected quantities needed to meet the requirement and scheduled using the negotiated delivery date (the Bill of Material (BOM) is typically the basis of the budgets). Materials can range from major

procured subsystems and fixtures to things such as structural steel, concrete, asphalt, and lumber. Installed equipment includes any custom or mass produced assemblies that become part of the project, such as generators, pumps, chillers and other similar equipment. Budget for authorized subcontractor work is based initially on the prime contractor's estimated value and must be updated to reflect final negotiations. Authorized subcontracted work must be integrated into the prime contractor's PMB.

QE LOI DISCUSSION

9.C.1. ARE BUDGETS AT THE WP LEVEL IN DOLLARS? IF NOT, ARE THEY CONVERTED TO DOLLARS FOR ROLLUP AND REPORTING PURPOSES?

Budgets are typically planned in hours for labor elements, dollars for other direct costs, and quantities for material elements. Material WPs may be initially planned as yards of concrete, tons of steel, etc. However, all WP budgets must be converted to dollars through the application of standard labor rates, material unit prices, etc. Overhead and other indirect rates (approved, provisional, or proposed) are also applied as appropriate for the inclusion of indirect components of WPs. WP budgets are then rolled up to the CA level and included in performance reports.

IMPACT OF NONCOMPLIANCE

Failure to be able to rollup costs by dollars will prohibit reconciliation with the PMB or compliance with other QE LOIs requiring WBS and OBS rollup.

GUIDELINE 10 - DETERMINE DISCRETE WORK AND OBJECTIVE MEASURES

TO THE EXTENT IT IS PRACTICABLE TO IDENTIFY THE AUTHORIZED WORK IN DISCRETE WORK PACKAGES, ESTABLISH BUDGETS FOR THIS WORK IN TERMS OF DOLLARS, HOURS, OR OTHER MEASURABLE UNITS. WHERE THE ENTIRE CONTROL ACCOUNT IS NOT SUBDIVIDED INTO WORK PACKAGES, IDENTIFY THE FAR-TERM TERM EFFORT IN LARGER PLANNING PACKAGES FOR BUDGET AND SCHEDULING PURPOSES.

PURPOSE OF THE GUIDELINE

Ensure control account work scope is partitioned into executable and measurable segments of work that are accomplished within the authorized control account period of performance (POP).

MANAGEMENT VALUE OF THE GUIDELINE

Because it may not be practicable to do grassroots planning for an entire project for which there is insufficient information to make detail planning impractical, the transfer of planning package (or far-term) budgets into precise work package (or short-term) budgets typically starts 30-45 days prior to the beginning of the next 6 month rolling wave planning period or 1-year block planning period. This process is followed until all long term budgets have been incorporated into a detailed plan. The selection of an appropriate WP Earned Value Technique (EVT) allows for accurate and objective performance measurement. The selection of EVT that best reflect the activity being performed can provide accurate status and situational awareness for proactive resolution of issues impacting cost, schedule, and technical achievement of project objectives.

IMPACT OF NONCOMPLIANCE

The selection of inappropriate EVTs would not allow for accurate and objective performance measurement. This could result in lagging resolutions of issues impacting schedule, cost and technical achievement of project objectives.

10.A. SUBSECTION - WP AND PP PLANNING

Effort contained within a CA is distributed into either WPs or PPs. WPs are the manageable units of work that must be accomplished in order to fulfill the contractual goals and deliverables on the project. The resources assigned to WPs are to be time- phased the way the detail work is to be accomplished. The selection of appropriate EVTs will allow for accurate and objective performance measurement. WP descriptions and titles must clearly distinguish one WP effort from another. The schedule may have more detail below the WP/planning package level to support the development of a realistic critical path, as applicable.

QE LOI DISCUSSION

10.A.1. DO DISCRETE WPs HAVE DURATIONS LIMITED TO A RELATIVELY SHORT SPAN OF TIME THAT IS PRACTICAL AND APPROPRIATE FOR THE WORK SCOPE? IF NOT, ARE THESE WPs SUPPORTED BY OBJECTIVE INTERIM MEASURES SUCH AS POINTS OF TECHNICAL ACHIEVEMENT TO ENABLE ACCURATE PERFORMANCE ASSESSMENT?

The objective of a WP is to plan, execute, and complete a distinct portion of the scheduled scope, moving on to the next logically driven sequence of scope/WP. Planning the work in small,

manageable segments provides for a more accurate objective measurement of progress at the activity level. It is important that BCWP (or the value for worked completed) is calculated in a manner consistent with the way work is planned (BCWS). Discrete work is defined as a specific product or service with distinct and measurable outputs that are relatable to the project's technical objectives. These measurable outputs are where project status can be measured objectively. These outputs are accomplished by planning the work in small, manageable segments that provide for a more accurate object measurement of the progress as task execution is measured at the working level. WP and planning package quantities, sizes and durations within a control account will vary subject to scope, internal management needs, and the size and complexity of the contract. Examples of measurable products or outputs include design efforts, a tool design package, a build-to-package, a shop order, a part number, a purchase order, or any other definable product.

The expectation is that WPs in the detail planning period should be 44 working days or less in duration to support quantitative earned value assessment and to have executable detail for the current periods. The 44 working days represents two accounting months according to most accounting calendars. Discrete WPs may be longer than 44 working days (up to six months) when supported by quantifiable backup data (QBDs) with technical progress points. See QE LOI 10.B.1 for QBD requirements. There is no intent to artificially break up a work package. Each work package is unique and has exit criteria. The intent is that what is defined as a work package is at a certain level of fidelity. Excessively long work packages should not be allowed as they do not support a rolling wave or block plan concept.

IMPACT OF NONCOMPLIANCE

The ability to measure progress objectively is diminished which increases the potential for significant variances. Additionally, long duration WPs (greater than 44 working days) impact the CAM's flexibility in planning once the effort has started.

10.A.2. ARE WPs DEFINED AT THE LEVEL WHERE THE WORK IS PERFORMED, AND IS EACH WP ASSIGNED TO AN ORGANIZATION?

WPs are single activities that may be supported by multiple activities assigned to a performing organization or work team for completion and are natural subdivisions of the control account work scope having a definable end product or event. WPs are developed to reflect how the work will be executed and technical progress will be measured at the level where work is performed. This provides an effective approach to planning, measuring progress, accruing actual costs, conducting variance analysis, and forecasting final costs at completion and finish dates. A single performing organization is considered to be a work team (i.e., resources) under the management of a single lead.

IMPACT OF NONCOMPLIANCE

Failure to identify WPs at the performance level can result in an ineffective baseline for performance measurement.

10.A.3. DOES THE SUMMATION OF A CONTROL ACCOUNT'S WPs AND PLANNING PACKAGES REPRESENT THE TOTAL SCOPE OF THE CONTROL ACCOUNT?

Effort contained within a Control Account (CA) is distributed to WPs and PPs and segregated by Elements of Cost (EOC). WPs are planned in detail at the outset and are for near term effort while

PPs are aggregates of future activities and resources beyond the detail near term plan. Both WPs and PPs have time-phased resources that must be supported by a defined scope of work. The combination of these two elements represents the entire CA scope of effort.

IMPACT OF NONCOMPLIANCE

Without integration between WP and PP scope, budgets and resource requirements will be inaccurate. Planning will not reflect the correct work scope and may adversely impact the CAMs' ability to complete the effort.

10.A.4. ARE BUDGETS OR VALUES ASSIGNED TO WORK PACKAGES AND PLANNING PACKAGES IN TERMS OF DOLLARS, HOURS, OR OTHER MEASURABLE UNITS THAT ARE CONSISTENT WITH PROJECT REQUIREMENTS?

Budgets established at the WP level identify specific resource requirements in dollars, hours, or other measurable units for detail "near term" planning. PPs are aggregates of future activities and resources beyond the detail plan or "near term" that must be divided into WPs at the earliest point in time when detail work content is known.

The time-phased resources assigned to the PPs must be supported by a specified scope of work and this relationship must be maintained when detailed planning of the effort occurs. The PP budgets must also be identified in dollars, hours or other measurable units. These WP and PP budgets must provide sufficient detail to support the effective execution of the baseline plan. If the detail is not in dollars, the project must document how the effort is priced to create BCWS. The hours or other measurable units must be converted to dollars before it is summarized to the control account level. See QE LOI 9.C.1 for requirement to convert the budget to dollars for rollup.

IMPACT OF NONCOMPLIANCE

Failure to maintain the link between the work scope and budget (resources) in terms of dollars, hours, or other measurable units for the PMB will invalidate the schedule, cost metrics and EV reporting. The PMB will not be integrated or able to be properly executed.

10.A.5. ARE WP AND PLANNING PACKAGE BUDGETS TRACEABLE TO THE BASIS OF ESTIMATE (COST ESTIMATE), AS MODIFIED BY PROJECT DEFINITIZATION, PROJECT CHANGES, OR APPROVED BASELINE CHANGES?

The underlying purpose of budgeting is to provide the foundation on which project requirements are expressed in terms of dollars and hours, including reasonableness of staff loading, material purchases, subcontract expenses, and other direct costs. The Basis of Estimate (BOE) details the premise, or basis, from which critical aspects of a project cost estimate were developed including cost and labor estimates, material availability, any assumptions or deviations, any studies or analysis used as a reference and any other details which impacted the cost estimates. The practice of estimating the costs associated with an event or activity starts in the proposal stage and continues all through the project's life cycle. Because the ability of the project to stay within the original estimate is determined by the proficiency of CAMs to follow a systematic approach to managing, the ultimate decision making for each area of budget allocation rests with the CAM rather than a

group of estimators. In addition to satisfying the technical requirements of the SOW, the CAM must document the "how and why" behind each cost estimate. This justification should clearly address the technique used and assumptions applied. The initial basis of estimate (BOE) developed in support of the proposal, which must reconcile to the current budget allocated to WP/PPs. This reconciliation will include changes caused by the project definitization (adjusted in negotiations) and approved baseline changes such as use of MR.

IMPACT OF NONCOMPLIANCE

Failure to base WP and planning budgets on the initial BOE may result in inconsistent planning and exclusion of authorized work scope.

10.A.6. ARE WPs ASSIGNED EVTS IN ACCORDANCE WITH THE SYSTEM DESCRIPTION AND CONSISTENT WITH THE NATURE OF THE PLANNED WORK?

The selection of an appropriate WP Earned Value Technique (EVT) allows for accurate and objective performance measurement. The selection of EVT that best reflect the activity being performed can provide accurate status and situational awareness for proactive resolution of issues impacting cost, schedule, and technical achievement of project objectives.

It is important that BCWP is calculated in a manner consistent with the way work is planned. The inability to assess progress in the same manner in which the work was planned results in an inaccurate and subjective determination of progress. In order for the contractor PM to effectively manage execution of the project within budget and schedule constraints, discrete WPs must be established and objectively measured. Each WP is established using the most appropriate method to budget and then measure its progress toward completion. The EVT is established based on how the work is planned (Budgeted Cost for Work Scheduled (BCWS)), and how performance will be earned. Based on the nature of the work contained in WPs, an appropriate EVT is identified for measuring work accomplishment.

Subcontractor Schedule of Values (SOV) is a detailed statement furnished by a construction contractor, builder or others outlining the portions of the contract sum. It allocates values for the various parts of the work and is also used as the basis for submitting and reviewing progress payments. As a project begins, the subcontractor submits a Schedule of Values based on the original subcontract amount to the prime contractor for review. This is reviewed by all parties and approved if it is deemed acceptable. The Schedule of Values can be amended by change order. When using the Schedule of Values for pay applications the submitter will typically bill on a percentage basis. That is to say that the amount billed that month is X% of the overall line item. This value is then added to the total amount billed from previous pay requests. This total amount would reflect the total work completed to date. The balance to finish is then calculated by subtracting the total completed to date from the original line item total. The prime contractor will then review and approve the amount because of the subcontractor during that pay period. This is an official document between the subcontractor and contractor that documents performance plans tied with payment. When the plan milestone is complete the payment is earned. In earned value terminology it is also known as progress payments. Taken by itself the subcontractor SOV cannot be used as a legitimate earned value management performance measurement indicator. This is because earned value (or BCWP) must be based on technical accomplishment commensurate with the allocation of resources and not a financial transaction.

For subcontractor SOV to be used as an earned value management performance measurement indicator it must consist of two required elements:

1) It has accomplishment based payment milestones. A positive example is successful delivery. An example not accomplishment based is start of fabrication.
2) Time phasing payment milestone is not front-loaded.

IMPACT OF NONCOMPLIANCE

Inaccurate reporting of BCWP causes artificial CVs and SVs, which in turn results in inaccurate EVMS reporting to project management and the DOE.

10.A.7. ARE WP EXIT OR COMPLETION CRITERIA DEFINED?

It is important that BCWP is calculated in a manner consistent with the way work is planned. The inability to assess progress in the same manner in which the work was planned results in an inaccurate and subjective determination of progress. Said differently, the assessment of progress and performance (i.e., BCWP) must align with the time-phased spread of budget (i.e., BCWS) in order to avoid occurrences of false variances.

Additionally, and of most importance, is the requirement to identifying appropriate, objective completion criteria that will align how technical performance will be accomplished is essential for accurate measurement of progress (BCWP). The completion criteria must answer the question: 'what does done look like, rather than what work has been done'?

IMPACT OF NONCOMPLIANCE

WP planning would not align with the intended project goals. Not knowing when the effort is complete leads to cost overruns and schedule delays as well as inaccurate assessment of progress to an unclear end product.

10.A.8. ARE WPs CLEARLY DISTINGUISHABLE FROM ALL OTHER WPs INCLUDING THE TITLES BEING UNIQUE AND CONSISTENT WITH THE SCOPE OF THE WP?

Work packages should reflect the actual way the work is to be done and should be a clearly distinguishable subdivision of a CA. Each WP must be distinct from other WPs, with each WP containing mutually exclusive work scope and a unique Work package title/ID in the Cost Tool.

IMPACT OF NONCOMPLIANCE

Confusion in identifying specific WPs leads to inaccurate planning, inefficient expenditure of resources and inaccurate performance measurement. This may also result in invalid EACs reported to the DOE.

10.A.9. ARE THE EVTS FOR MATERIAL CONSISTENT WITH THE MANNER IN WHICH MATERIAL IS PLANNED?

The selection of EVT that best reflect the activity being performed can provide accurate status and situational awareness for proactive resolution of issues impacting cost, schedule, and technical achievement of project objectives. Material is planned based upon when it is needed. The point of

performance must be established no earlier than the actual receipt of the material items but as close as-in-progress, receipt (with inspection and acceptance), and delivery to the user (i.e., for direct delivery material).

HDV and/or critical material are planned discretely using objective milestones or other rational basis to measure the amount of material received. If there is no guidance to differentiate between low and HDV material, all material must be planned as discrete HDV material requirements. For some low value material items, LOE may be the appropriate EVT provided there is company guidance.

Another technique called PERT cost (EAC Based, see Appendix B for Formula) is preferred to LOE for low value material but may only be used for low value material.

The planned budget must be consistent with the point in the material cycle when performance is expected to be claimed. For example, if milestones were set up to claim performance for critical or high value material, then the budget must be planned against these milestones. This alignment ensures a valid measurement of schedule variance. Procurement activities are part of the construction process and must be scheduled as such.

Material must be segregated from other elements of cost as performance is earned differently. It must be planned and scheduled in support of the final negotiated delivery dates so that the material items will be available when needed. Leading up to final negotiations the need date should be used for planning and scheduling purposed. If a negotiated delivery date occurs prior to the actual need date, the baseline project schedule should reflect the negotiated delivery date. This will ensure for the accurate assessment of material performance measurement to align with the procurement system. Like any construction activity, procurement activities must be planned and coordinated with suppliers and accurately reflected in the schedule for coordination purposes. If the construction installation successor activity is not immediately needed to be completed, the procurement activity should report a positive float value leading to its successor installation activity, for example. It is important that the procurement activity not be arbitrarily planned and baselined inconsistent with the negotiated delivery date and procurement system. Enough detail must be included in the project schedule for timely identification of problems and delays on the procurement of key materials and equipment which can have a domino effect on successor construction activities. Material is also time-phased by dollar amount based on the type of material. Contractors must conduct an analysis to identify and differentiate categories of material, appropriate planning method, and the associated EVT. This analysis must distinguish between material and subcontracted effort. (See Guideline 21 for further information on material EVTs and HDV definitions).

IMPACT OF NONCOMPLIANCE

The material EVTS would not provide accurate status and situational awareness for proactive resolution of issues impacting cost, schedule, and technical achievement of project objectives.

10.A.10. DO SLPPs AND PLANNING PACKAGES HAVE SCOPE, SCHEDULE, AND BUDGET DEFINED BY EOC?

PPs represent the portion of a control account that has not yet been detail planned. They must have a specific scope, schedule and associated budget but do not have established methods of earning

performance. SLPPs are efforts at a higher level not assigned to control accounts but still have scope, schedule and budget by element of cost.

IMPACT OF NONCOMPLIANCE

Project work scope would not be accomplished in a well-planned manner, placing the project at risk for not meeting goals and deliverables.

10.A.11. DO WORK PACKAGE EVTS RESULT IN THE ABILITY TO CLAIM PROGRESS IN ALL MONTHS IN WHICH RESOURCES ARE SCHEDULED AT THE TIME THE WORK PACKAGE IS BASELINED, AND BASED ON OBJECTIVE INDICATORS AS APPROPRIATE?

The selection of an appropriate WP Earned Value Technique (EVT) allows for accurate and objective performance measurement. Objective accomplishments and completion criteria are determined in advance and used to measure progress to determine achievement of milestones/events or other indicators. The CAM monitors interim milestones and work packages (or lower level tasks/activities) that serve as indicators of progress. Control account planning must interface and align directly with critical milestones and events, accomplishments, and criteria or other progress indicators listed in subordinate schedules. Performance metrics ensure that maximum time is allowed for management action to keep the project on plan. The intent of earned value as it relates to objective criteria and EVTs is that the work is statused consistent with the technical progress. Said a different way, if the work is on schedule, it should not have a schedule variance, and if it is behind or ahead of schedule, it should have a negative or positive schedule variance. This evaluation is accomplished with objective indicators that reflect technical accomplishment in the BCWP for all discrete work and for each of the project's key events, decision points, and milestones. This process provides managers with accurate schedule status and credible early indications of project problems where there is a need to take corrective action.

The objective indicators required at the WP level depends on the EVT. For example:

- 0/100 is limited to WPs that will be complete within the same accounting month as the start. They should not exceed 21 work days in duration. The objective indicator is the WP exit criteria.
- 50/50 is limited to WP with durations of two accounting periods (i.e. 42 work days or less). The objective indicator is the WP exit criteria.
- Milestones or Milestone weights with percent complete. The objective indicators are the milestone definitions/definitions of completion. Note, to meet the intent of the QE LOI, milestone weights with percent complete require at least one technically-based milestone every other month to prevent artificial schedule and cost variances.
- Percent Complete WPs requires objective indicators. If the duration of the WP is within a single accounting month, the objective indicator is the WP exit criteria, just like a 0/100 technique. Above this duration should be supported by quantifiable backup data (QBDs) or rules of performance that restrict the percentage completion to predetermined measures of technical progress. These QBDs are subject to change control once the WP has started and should also have enough technically-based QBDs so at least one can be completed every month, preventing artificial schedule and cost variances.
- LOE is not an objective EVT and therefore has no objective indicators. LOE performance is claimed solely by the passage of time and will be claimed regardless whether any actual

work was performed. For this reason, the use of LOE as and EVT should be limited solely to work that is not measurable.

- Apportioned effort is work associated with other discrete work and therefore has no specific unique objective indicators; however, the methods of the apportionment must be documented, logical and demonstrable. Apportioned effort must have a direct relationship to discrete work whereby the percent complete reported by the discrete effort is appropriate for the percent complete to be reported by the apportioned effort.

WP EVTs may be assigned at the WP level or to the activities within the WP supported by EVTs at the schedule activity level. The official EVT WP percent complete is determined by the sum of activity percent complete BCWP of WP activities reported to the EVM Cost Tool. When supported by activity level EVTs the following aspects are required:

- Discrete WPs should not comingle discrete and LOE activities. If LOE activities are contained within a predominantly discrete CA, the LOE work should not exceed 10 percent and the performance of the discrete work must be clearly discernable.
- LOE comingling with discrete work at the activity level follows the commingling restrictions in QE LOI 12.A.2
- Discrete activities must be associated with EVTs (follow the EVT duration guidelines in this QE LOI).
- BCWP is calculated by activity and summarized to the WP level in the EVM Cost Tool to calculate the percent complete.
- The percent complete in the IMS is transferred to the percent complete in the EVM Cost Tool.

IMPACT OF NONCOMPLIANCE

Inability to accurately convert technical progress into a measure of performance (i.e., BCWP) invalidates the EVM reporting of the project.

10.A.12. IS DISCRETE PERFORMANCE DETERMINED IN THE IMS IDENTICAL TO THAT REPRESENTED IN THE EVM COST TOOL?

The IMS is the source for dates and progress of discrete effort to the EVM Cost Tool. The technical basis of progress is reported to the EVM Cost Tool, summarized if necessary and produces BCWP for analytical use to support managerial decisions. The pathway from schedule baseline to schedule forecast, to status, to BCWP must be documented, consistent and accurate.

When the CAM provides status to the schedule, at least on a monthly basis, the same information must be accurately reflected in the products from the EVM Cost Tool without adjustments from outside departments or individuals. The progress status reported by the CAM is based on technical achievement, not on elapsed activity duration. Therefore, progress is reported and transmitted to the EVM Cost Tool based on physical % complete or other fields, and not on a percent complete based elapsed planned duration. With these processes in place, many issues that are identified in the EVM data can easily be traced back to the IMS for cause, impact and corrective action.

IMPACT OF NONCOMPLIANCE

If the IMS and the EVM Cost Tool are out of alignment with reporting progress, management and customer are deprived of sufficient reliable information to make competent management decisions.

10.B. SUBSECTION - WP STATUS

An accurate measurement of progress or status provides management with the information necessary to make decisions regarding issues that impact cost, schedule, and technical achievement of project objectives. Measurement of performance must be aligned with the EVTs selected during the planning process to ensure consistency between how the effort was planned to be executed and how progress is measured and reported. The appropriate EVT provides an objective measurement of progress.

QE LOI DISCUSSION

10.B.1. IS THE PERCENT COMPLETE EARNED VALUE TECHNIQUE (EVT) APPLIED AT THE LEVEL AT WHICH PERFORMANCE IS ASSESSED, SUPPORTED BY QUANTIFIABLE BACKUP DOCUMENTATION (QBD) IF LONGER THAN 44 WORKING DAYS?

The earned value or BCWP claimed during the statusing process must be objectively measured. Interim measurements of progress should be documented with QBDs for WPs greater than 44 working days. Generally, QBDs are developed to support an easy compilation of tracking status by smaller increments to the reported percent complete value. An example is show in Figure 14.

Work Package QBD - Develop Water Drainage Drawings					
		Hours	% Total	Cum % Accomplishment	Completed
QBD 1	Review Specs	20	14%	100%	3/22/2015
QBD 2	Complete initial concept	40	29%	100%	4/28/2015
QBD 3	Complete initial drawings	60	43%	10%	
QBD 4	Complete final drawings	20	14%	0%	
	Total	140	100%	47%	

Figure 14 - QBD Example

The CAM reviews the applicable QBD when statusing the WP and claims the % complete based on the values in the QBD. The CAM must consistently follow the established allocated units (hours in the example) when claiming performance. The CAM is limited to the values in the Cum% column to ensure the measurement of progress is supported by the QBD. While the example reflects a logical sequence of completing the QBDs in order (1, 2, 3, 4), other QBDs may be completed in any order, if appropriate. Alternatively, QBDs may be represented in the IMS as activities logically planned.

IMPACT OF NONCOMPLIANCE

Inaccurate measurement of BCWP causes both CVs and SVs to be inaccurate and impacts the validity of the variance analyses and the EAC reported to DOE.

10.B.2. IS ANY WORK CLASSIFIED AS APPORTIONED EFFORT EVT PROPERLY CLASSIFIED, AND DIRECTLY PROPORTIONAL TO OTHER DISCRETE TASK(S)?

Apportioned effort is effort that by itself is not readily measured or divisible into discrete WPs. Apportioned work must have an identifiable and proportional relationship to a separate but related discrete task.

A typical example of apportioned effort is quality inspection, which is directly related to the final assembly of an item. The inspectors cannot perform their work until the item is assembled. BCWS is planned and BCWP earned as a direct percentage of the related (a.k.a. base) discrete WP(s) BCWS and BCWP. Therefore, the durations and schedules for both the discrete and apportioned WPs must be the same. The apportioned relationship must be based upon history and must be documented by the CAM. ACWP is recorded directly and not apportioned from the base WP. Inaccurate EVMS reporting impacts the CAMs ability to effectively manage the control account.

IMPACT OF NONCOMPLIANCE

The lack of properly identified apportioned work scope that is proportionate to discrete work scope, including the inspection of finished products to ensure compliance with applicable specifications, will result in the misappropriation of the LOE EV technique and the apportioned effort directly relatable to the discrete work it directly supports not being proactively managed. The impact from this guideline has far reaching implications, not only within this guideline but also in the ability to produce timely and accurate EACs. The inability to assess progress in the same manner in which the work is executed results in an inaccurate and subjective determination of progress.

GUIDELINE 11 - SUM WP/PP BUDGETS TO CONTROL ACCOUNT

PROVIDE THAT THE SUM OF ALL WP BUDGETS PLUS PLANNING PACKAGE BUDGETS WITHIN A CONTROL ACCOUNT EQUALS THE CONTROL ACCOUNT BUDGET.

PURPOSE OF THE GUIDELINE

All CAs must contain scope, schedule and budget that realistically represents the work assigned and budgeted to the organizational units. In all cases, the value of the budget assigned to individual WPs and PPs within the CA sum to the total value authorized for the CA.

MANAGEMENT VALUE OF THE GUIDELINE

To maintain the integrity of the Performance Measurement Baseline (PMB), the budgets of the work packages and planning packages must sum to the associated control account's authorized Budget at Completion (BAC). The work package and planning package budgets accurately summarize to the control account (scope, schedule, resources/budgets) and are the same value that is time-phased into work packages and planning packages. The benefit of proper summarization results in a project plan that correlates with the contract requirements and, therefore, provides a common reference point for government-contractor discussions and for accurate progress assessments. It avoids the over or under allocation of project budgets.

IMPACT OF NONCOMPLIANCE

Failure to ensure the sum of the budgets of the work packages and planning packages sum to the associated control account's authorized Budget at Completion (BAC) would not result in a project plan that correlates with the contract requirements. It would not provide a common reference point for government-contractor discussions for accurate progress assessments.

QE LOI DISCUSSION

11.A.1. DO THE SUM OF ALL WORK PACKAGE BUDGETS PLUS PLANNING PACKAGE BUDGETS WITHIN CONTROL ACCOUNTS EQUAL THE BUDGETS AUTHORIZED FOR THOSE CONTROL ACCOUNTS?

All CAs contain the budget that represents the work scope assigned to the responsible organization for that specific effort. This includes WPs and PPs. The value of the budget assigned to individual WPs and PPs within the control account must sum to the total budget authorized for that control account.

IMPACT OF NONCOMPLIANCE

Lack of integration of WPs and PPs to CAs invalidates the usefulness of EVM reporting.

GUIDELINE 12 - LEVEL OF EFFORT (LOE) PLANNING AND CONTROL

IDENTIFY AND CONTROL LEVEL OF EFFORT ACTIVITY BY TIME-PHASED BUDGETS ESTABLISHED FOR THIS PURPOSE. ONLY THAT EFFORT WHICH IS NOT MEASURABLE OR FOR WHICH MEASUREMENT IS IMPRACTICABLE MAY BE CLASSIFIED AS LEVEL OF EFFORT.

PURPOSE OF THE GUIDELINE

The purpose of this GL is to ensure level of effort (LOE) is limited only to those activities that should not or cannot be discretely planned.

MANAGEMENT VALUE OF THE GUIDELINE

Classification of work scope as LOE is limited to activities that have no practicable, measurable output or product associated with technical effort that can be discretely planned and objectively measured at the work package level. In every project, there are tasks accomplished that by their nature are unmeasurable. Prudent use of LOE is necessary to minimize the distortion of performance data for effective project management. The need to look at each effort on the project and determine if there is a way to measure progress towards its completion leads to a Performance Measurement Baseline (PMB) that provides accurate information to management for project decision-making.

IMPACT OF NONCOMPLIANCE

Failure to ensure level of effort (LOE) is limited only to those activities that should not or cannot be discretely planned would distort performance data for effective project management.

QE LOI DISSCUSSION

12.A.1. IS THE LOE EV TECHNIQUE ONLY USED FOR EFFORT WHERE MEASUREMENT IS IMPRACTICAL OR WORK THAT DOES NOT PRODUCE A DEFINABLE END PRODUCT?

LOE WPs/activities must not be a predecessor to discrete work activities, as that would potentially distort the calculation of the critical path (see 6.C.1). However, LOE could be a successor from a discrete activity with no harm to the critical path calculation. LOE is work defined as having no practicable, measurable output or product that can be discretely planned and objectively measured. LOE scope is typically administrative or supportive in nature and may include work in areas such as project management, contract administration, financial management, security, field support, help desk support, clerical support, etc. When determining whether LOE as an earned value technique (EVT) is appropriate, an understanding of the nature of the work is imperative rather than setting a threshold for the amount of LOE allowed. The contractor should provide a documented methodology (i.e., process flow) for how LOE work is distinguishable from that of discrete and apportioned work.

A primary deciding factor on whether LOE can be used is whether it can be delayed without impacting discrete work. A true LOE can slip years without impacting other discrete work. For example, project controls may produce monthly reports and be responsible for uploads to PARSII each month. Although these functions are DOE requirements, the slippage would not affect discrete work and so it could be tracked as level of effort. Staffing of level of effort is also an indication.

Management level activities are typically planned by headcount (hours will peak in longer accounting months) and also typically LOE.

IMPACT OF NONCOMPLIANCE

Inappropriately coding measurable work using the LOE EVT limits the ability to measure the performance of that work and tends to mask the performance of other measurable work in the WP, CA and the project.

12.A.2. IS THE CO-MINGLING OF LOE AND DISCRETE EFFORT WITHIN A CONTROL ACCOUNT MINIMIZED TO ENSURE VISIBILITY OF THE PERFORMANCE MEASUREMENT OF THE DISCRETE EFFORT?

The focus of this QE LOI is within the CA. LOE is earned through the passing of time and therefore can have no schedule variance. LOE work should not be mixed with discrete work within a WP as it will mask the true performance of the discrete work. If LOE WPs and discrete WPs are contained within a CA, there must be a means of separately measuring the performance of the discrete work. As a general rule, the amount of LOE WP budget at complete (BAC) within a predominately discrete CA should not exceed 10 percent of the CA BAC to keep from masking the performance of the discrete work. If exceeded, a separate CA for the LOE should be considered.

Because LOE accrues BCWP equal to BCWS by the passage of time, there is no objectivity in measuring progress. The SV is always = 0, which tends to mask SV's applicability to discrete effort if LOE and discrete EVT types are co-mingled within a single CA. When a CA contains WPs planned with both discrete and LOE, care must be taken to minimize any potential distortion of CA performance.

It is optional for a contractor to support WPs with EVTs at the activity level. However, a single EVT is required at the WP level. One of the basic tenants is that work packages are uniquely discrete, apportioned effort, or LOE. Therefore, if WP level EVTs are supported by EVTs at the activity level then discrete WPs may only be supported by discrete activity level EVTs.

IMPACT OF NONCOMPLIANCE

The schedule performance (BCWP) of the CA may be masked by the co-mingled LOE and discrete effort. This could result in an inaccurate overall progress assessment for the project.

GUIDELINE 14 - IDENTIFY MR AND UB

IDENTIFY MANAGEMENT RESERVES AND UNDISTRIBUTED BUDGET

PURPOSE OF THE GUIDELINE

Ensure the budgets established for Management Reserve (MR) and Undistributed Budget (UB) are separately identified and controlled.

MANAGEMENT VALUE OF THE GUIDELINE

The ability to establish MR allows project management to react to unforeseen in-scope situations that arise during the life of a project. MR is budget for handling project risk and in-scope unanticipated events. MR is not a source of funding for additional work scope or for the elimination of performance variances. UB is budget that is applicable to specific contractual effort that has not yet been distributed to control accounts or SLPPs. UB may also contain scope subject to removal from the distributed baseline due to contractual changes. Identification of the project's UB, facilitates project management's ability to account for and report on all authorized scope and budget. UB is a transitional budget that should be distributed in a timely manner.

IMPACT OF NONCOMPLIANCE

Without MR the project management team would not be able to react to unforeseen in-scope situations in a timely manner (or at all). Without UB project management's ability to account for and report on all authorized scope and budget would be minimized.

14.A. SUBSECTION - MANAGEMENT RESERVE

Identify management reserves and undistributed budget. The purpose of GL 14 is to ensure the budgets established for Management Reserve (MR) and Undistributed Budget (UB) are separately identified and controlled.

MR is budget set aside allowing project management to react to project risk and in-scope, unanticipated events that arise during the life of a project. MR is not associated with a specific scope of work until it is allocated to a CA and therefore, is not included in the PMB. The application of MR must be formally allocated through the change control process. Through this process, the MR budget is transferred to WPs within the PMB. MR is not a source of budget for additional work scope (out of scope of the contract/project) or for the elimination of performance variances. MR belonging to a major subcontractor must be incorporated into the prime contractor's EVMS with traceability to the subcontractor's reported MR. The MR budget should be commensurate with the level of risks identified by project management.

QE LOI DISCUSSION

14.A.1. DOES MR BUDGET HAVE NO SCOPE DEFINED AND IS IT HELD OUTSIDE THE PMB AND CONTROLLED BY THE CONTRACTOR?

The ability to establish MR allows project management to react to unforeseen in-scope situations that arise during the life of a project. MR is budget for handling project risk and in-scope unanticipated events. MR is not a source of funding for additional work scope or for the elimination of performance variances. MR is an amount of the project budget set aside for management control purposes by the contractor. Management Reserve is the contractor's budget. MR provides project

management with a budget for unplanned activities within the current project scope. Because MR is budget that is not yet associated to work scope, it is not part of the PMB.

IMPACT OF NONCOMPLIANCE
Failure to segregate MR from PMB overstates PMB and adds risk to project completion.

14.A.2. ARE CONTINGENCY BUDGETS, IF ANY, HELD OUTSIDE THE CBB?

DOE Contingency budgets are budgets that are available for risk associated with technical uncertainty or programmatic risks owned by the Government. Contingency budgets are controlled by the Federal staff. While contingency is included in the Total Project Cost (TPC), it is not part of the CBB.

IMPACT OF NONCOMPLIANCE
The CBB would be artificially increased creating the potential for the planning to be in excess of the contractually authorized amount.

14.A.3. IS MR CORRECTLY DEFINED IN THE SYSTEM DESCRIPTION AND ARE ALLOWABLE APPLICATIONS OF MR LISTED/DEFINED?

The contractor must include a clear definition of MR in the EVM SD. For clarity and consistency, the EVM SD must describe the process and list allowable conditions under which MR may be approved and allocated to the PMB CAs. MR cannot be used to offset accumulated overruns or under runs. Authorized uses of MR include:

- Previously unrecognized tasks or realized risks consistent with the general scope of work of the contract;
- Change in execution strategy (e.g., make/buy decisions);
- Unexpected future internal scope growth within the currently authorized scope of the project;
- Direct and indirect rate changes and currency fluctuations;
- Risk and opportunity handling (not for cost or schedule variance based risks);
- Work that needs to be repeated (not the result of inaccurately reported progress);
- Changes to the future budget of work not yet started (e.g., subcontractor activities that are negotiated post project award).

IMPACT OF NONCOMPLIANCE
Failure to properly define and list the conditions for MR will result in misinterpretation and inconsistent use of MR, limiting the contractor PM's ability to manage MR.

14.B. SUBSECTION - UNDISTRIBUTED BUDGET

UB is budget that is applicable to specific contractual effort that has not yet been distributed to control accounts or Summary Level Planning Packages (SLPPs). Identification of the project's UB, facilitates project/project management's ability to account for and report on all authorized scope and budget. UB is a transitional budget that should be distributed in a timely manner as work scope is finalized and distributed to CAs or to SLPPs. UB may also contain scope subject to removal from the distributed baseline because of contractual changes. Budgets for the near-term portion of scope should be allocated commensurate with when the work is authorized.

QE LOI DISCUSSION

14.B.1. DOES UB HAVE DEFINED SCOPE THAT IS SEPARATELY IDENTIFIED BY CHANGE AUTHORIZATION, TRACEABLE TO CONTRACTUAL ACTIONS AND IS IT PART OF THE PMB?

UB is part of the PMB and has budget associated with contractually authorized work scope that has not yet been distributed to an organizational element at or below the WBS reporting level.
The key of the QE LOI is that UB, unlike MR, always has scope. Each project change must be tracked within UB until totally allocated to the time phased PMB or MR. The format 5 of the IPMR/CPR must discuss the composition of the UB balance in terms of the project authorization. Scope and associated budgets that may reside in UB include:

- Authorized Unpriced Work (AUW),
- Newly definitized work scope,
- Work that has been de-scoped but not yet contractually removed from the project.

UB is a short-term holding account where the budget is expected to be distributed into the PMB or removed from the contract. Delays in contract direction may impact the timely distribution of UB into CAs.

IMPACT OF NONCOMPLIANCE
Unreconciled UB is equivalent to an unreconciled PMB.

14.B.2. AS A MINIMUM, IS AT LEAST THE NEAR-TERM PORTION OF AUTHORIZED UNPRICED WORK (AUW) DETAILED PLANNED IN CONTROL ACCOUNTS WITH THE REMAINDER CONTAINED IN UB?

AUW represents a contract scope change that has been directed by the government contracting officer but has not yet been fully negotiated or definitized. AUW includes a value, excluding fee or profit, typically associated with the authorized, unpriced change order. The word "unpriced" can be confusing. It means simply that the final cost to the government has not yet been negotiated at the final price. Often a change is authorized where the Government and contractor agree to start implementing the change before the value of the change is negotiated. When this happens, the contractor must add the expected value of the change to UB and then distribute a portion of that value to the CA(s) responsible for implementing the change in the near term prior to definitization. The budget initially distributed to the CA(s) may only represent the near-term effort to get started and the remainder of the budget stays in UB until the total value of the change is definitized. Any differences between the expected value of the change the contractor initially placed in UB and the defined value is reflected in a change to UB and documented as such. There may be an NTE value associated with the authorization. The contractor's estimate is used as the AUW for scope and budget purposes, and is unconstrained by an NTE funding value. Refer to GL 28, Subsection B.

IMPACT OF NONCOMPLIANCE
Without distribution from UB to the CA, near term effort cannot be planned in WPs and resources cannot begin work on it which results in a schedule slip. Without the remainder of the budget reflected in UB, reporting to project management and the DOE will be inaccurate.

GUIDELINE 15 - RECONCILE TO TARGET COSTS

PROVIDE THAT THE PROGRAM TARGET COST GOAL IS RECONCILED WITH THE SUM OF ALL INTERNAL PROGRAM BUDGETS AND MANAGEMENT RESERVES.

PURPOSE OF THE GUIDELINE

The project's Negotiated Contract Cost (NCC) plus Authorized Unpriced Work (AUW) must reconcile with the Contract Budget Base (CBB)/Total Allocated Budget (TAB).

MANAGEMENT VALUE OF THE GUIDELINE

By ensuring that the target cost value is traceable to the sum of the internal budgets and Management Reserve (MR), a common point of reference is established that is fully understood by all parties and supports both performance assessments and funding requirements.

Reconciling the sum of all internal project budgets (control account budgets, Summary Level Planning Packages (SLPPs), and Undistributed Budget (UB)) and MR to the contractually authorized cost establishes a valid comparison to the contract target cost. (See Fig. 10: Budget Hierarchy and Summarization.) It is essential for project management to account for all budget authorized for the contractual scope of work.

This accounting is demonstrated by reconciling the NCC plus the estimated value of any un-negotiated unpriced-change-orders received to date to the CBB and to the Performance Measurement Baseline (PMB) plus MR to ensure there is consistency. All control account budgets, SLPPs, and UB are summed up to a total value known as the Budget at Completion (BAC) of the PMB. Having validated the sum of the internal budgets, this sum plus MR equals the value known as the CBB. The CBB also equals the TAB unless there is a recognized Over-Target Baseline (OTB). In that case, the TAB must be reconciled to the CBB plus any recognized over target budget. (See Guideline 31 for more information related to OTB/OTS.)

IMPACT OF NONCOMPLIANCE

Failure to ensure that the target cost value is traceable to the sum of the internal budgets and Management Reserve (MR), would not provide a common point of reference that is established and fully understood by all parties to support both performance assessments and funding requirements.

QE LOI DISCUSSION

15.A.1. DOES THE TPC EQUAL CBB + OTB + FEE + ODC + DOE CONTINGENCY AS APPLICABLE?

The TPC has to cover both authorization and funding. The CBB, OTB, fee, ODC, and DOE contingency reflect the total Government cost authorized for the project. OTBs have no scope authorization but are recognized overruns of existing scope. So the actual formula that is always true is different for the budget and the funding.

- PMB + MR*b* + DOE Contingency / ODC*b*+ Fee*b* = TPC > = EAC + MR*r* + DOE Contingency + ODC EAC, + Fee earned/available

Note: In the above equation the left side is budget indicated by the subscript "b". The right side is remaining or EAC indicated by the subscript "r". The left side is also authorization and the right side is funding.

IMPACT OF NONCOMPLIANCE
Non-reconcilable TPC means the project cannot account for all budget authorized for the project.

15.A.2. IS THERE A RECONCILIATION OF THE TAB TO THE CBB?

Reconciling the sum of all internal project budgets (CA budgets, Summary Level PPs (SLPPs), and Undistributed Budget (UB)) and MR to the contractually authorized cost establishes a valid comparison to the CBB (the contract target cost).

It is essential for project management to account for all budget authorized for the contractual scope of work. This is demonstrated by reconciling the negotiated contract cost (NCC) plus the estimated value of any un-negotiated unpriced-change-orders received to date to the CBB and to the Performance Measurement Baseline (PMB) plus MR to ensure there is consistency. All CA budgets, SLPPs, and UB are summed up to a total value known as the Budget at Completion (BAC) of the PMB. Having validated the sum of the internal budgets, this sum plus MR equals the value known as the CBB.

- TAB (Total Allocated Budget) = CBB unless there is an OTB recognized. Then CBB + OTB = TAB.

IMPACT OF NONCOMPLIANCE
Inability to reconcile the TAB causes performance reporting to be unreliable, subject to challenge and suspect for use in making sound decisions.

4.0 ACCOUNTING CONSIDERATIONS

The Accounting Considerations category focuses on ensuring that all direct and indirect costs associated with accomplishing the complete scope of work contained in the contract are properly transferred to the EVM Cost Tool at the level of detail required for performance analysis and reconcilable to contract performance reports. All financial transactions must be documented, approved, and recorded properly in the financial accounting system on a consistent and timely basis in accordance with Generally Accepted Accounting Principles (GAAP) and applicable Cost Accounting Standards (CAS). As the EVM Cost Tool uses direct cost data from the contractor's accounting system to accurately report project costs and to conduct EVM performance and variance analysis, the accounting system is critical to ensuring EVM performance data is reliable and auditable. The primary objective of the six guidelines (16–21) that comprise this category is to ensure cost data is accurately collected for a valid comparison to budgets and performance.

The Accounting Considerations guidelines require that the direct costs recorded in a formal and accepted accounting system are reconcilable to the Actual Cost of Work Performed (ACWP) reported in the EVM Cost Tool. Direct costs are accumulated and charged to CAs consistent with planned budgets and acceptable costing techniques (Guideline 16). The guidelines also require actual costs to be accurately accumulated and summarized within the EVM Cost Tool by the project's WBS and OBS elements (Guidelines 17 and 18). All indirect costs allocable to a project must be properly recorded and correctly allocated (Guideline 19 – see Section 7.0 Indirect Guidelines). As applicable, the accounting system must be able to identify unit costs, equivalent unit costs, or lot costs, and distinguish between recurring and non-recurring costs (Guideline 20). Identifying unit costs is typically applicable to production contracts. Acceptable points for measuring material performance are specified and material costs are required to be reported in the same accounting period that performance is claimed. In the event direct costs for work accomplished have not yet been formally recorded in the accounting system, accruals and/or estimated actuals are used for EVM performance reporting and assessment thereby ensuring that any cost variances accurately represent the cost status of the work accomplished (Guidelines 16 and 21). Records showing full accountability for all material purchased for the contract, including residual inventory must be maintained (Guideline 21).

GUIDELINE 16 - RECORD DIRECT COSTS

16. A. RECORD DIRECT COSTS IN A MANNER CONSISTENT WITH THE BUDGETS IN A FORMAL SYSTEM CONTROLLED BY THE GENERAL BOOKS OF ACCOUNT.

PURPOSE OF THE GUIDELINE

The reconciliation section primary deals with the project reconciliation of ACWP. It also seeks to maintain overall consistency with the disclosure statement.

MANAGEMENT VALUE OF THE GUIDELINE

The Reconciliation with Source Systems section deals with how the accounting system is integrated with purchasing, labor, and other inputs to the accounting system. The accounting system is the books of record for ACWP and is updated from other source records. The Accounting Documentation subsection addresses the integration of open and closed charge numbers consistent with the work requirement.

IMPACT OF NONCOMPLIANCE

Failure to reconcile actuals between the accounting and cost systems invalidates the cost variance and prevents accurate and effective performance management.

16.A. SUBSECTION - ACCOUNTING ACCUMULATION AND RECONCILIATION WITH REPORTING

Record the direct costs in a manner consistent with the budgets in a formal system controlled by the general books of account. The QE LOIs in this section are primarily the responsibility of the project and the Project Controls Organization. The primary assumptions are that the EVM reported actuals reconcile with the accounting systems and are supported, if required, by estimated actuals. The calculation of ACWP is also consistent with the disclosure statement.

QE LOI DISCUSSION

16.A.1. IS THE ACTUAL COST OF WORK PERFORMED (ACWP) IN THE EVM COST TOOL FORMALLY RECONCILED EACH MONTH WITH THE ACTUAL COSTS IN THE ACCOUNTING SYSTEM?

The accounting system is the books of record for ACWP and is updated from other source records. Actuals from the accounting system and the ACWP reported in required EVM reports must be reconciled at the end of each accounting period and the results of the reconciliation should be documented. There are a couple of aspects that need to be considered:

- Reconciliation is required for ACWP reported as of the accounting month-end date. (Reconciliation does not mean equal. For example, estimated actuals may be needed for labor, material, or subcontractor payment lags).
- ACWP must be consistent with BCWP in terms of the reporting period.
- Reconciliation is required at the project level by EOC.
- Estimated actuals must be justified at the level applied.
- Reconciliation is both monthly and cumulative to date.

IMPACT OF NONCOMPLIANCE

Failure to reconcile actuals between the accounting and cost systems invalidates the cost variance and prevents accurate and effective performance management.

16.A.2. IS THE MANNER IN WHICH THE CONTRACTOR CLASSIFIES ITS DIRECT COST (DIRECT LABOR, MATERIAL, AND OTHER DIRECT COSTS) AND CREDITS CONSISTENT WITH THEIR APPROVED DISCLOSURE STATEMENT?

The accounting system seeks to maintain overall consistency with the disclosure statement. EOC such as labor, material and ODC defined in the Disclosure Statement must be consistent with the accounting system tracking of EOCs for direct cost elements. Note this is the accounting system EOCs and not the EVM Cost Tool EOCs. The matching of actual allowable costs to the planned budgets ensures only the resources expended to achieve that same scope/product can be accumulated against the CA.

IMPACT OF NONCOMPLIANCE

Inconsistency of direct costs to the disclosure statement means the contractor is not compliant with contract requirements approved by DOE CFO.

16.A.3. IS ACWP RECORDED IN THE SAME MONTH THAT BCWP IS CLAIMED (FOR ALL ELEMENTS OF COST)?

This QE LOI addresses the requirements for estimated actuals. In the event direct costs for subcontracted effort and/or material have not yet been formally recorded in the accounting system, estimated costs (estimated actuals) will be used for EVM performance reporting and assessment in the EVMS. This is to address timing differences between the accounting system and performance reports. Once direct costs have been recorded, they will replace the estimated costs (estimated actuals) recorded in the EVMS. This process may be used to project direct costs being removed from the EVMS, such as cost transfers, where the accounting process lags behind the identification of the need.

BCWP is the budgeted cost for what was accomplished. ACWP is what was spent to accomplish the work. BCWP-ACWP is the cost variance. For the validity of the cost variance both BCWP and ACWP must be reported in the same accounting period. However, some common reasons why they may be recorded in the accounting system in different months follow:

- Labor can be distorted because of significant errors that may be in process of correction. The primary sources for correction of labor errors are cost transfers or an individual justification.
- High Dollar Value (HDV) Material (see Guideline 21) typically has payment terms that may not coincide with calendar month-ends. By definition, HDV material is significant and tracked discretely. HDV material requires assessment of estimated actuals monthly if actuals have not been accrued. The source for the estimated actuals is typically the receipt record/purchase order cost.
- Subcontractors typically are required to status activities consistent with the prime's month-end date. Actuals may be delayed because of lagging invoices/payments. The source for estimated actuals is typically the subcontractor ACWP or invoice.

In all cases the ACWP must be recorded in the same month as the BCWP is recorded. There should not be months with significant BCWP without ACWP or vice versa. As general rule of thumb, "significant" is when BCWP is greater than $2K. The term accrual may be used instead of estimated actuals. Accruals are typically done directly in the accounting system and based on a purchase order, journal transfer or other verifiable record. If they are done in the accounting system, this LOI may be met since the reconciliation is between the accounting system and the EVM Cost Tool. All estimated costs (estimated actuals) used for performance reporting will be reconcilable between the Accounting General Ledger and the EVM Cost Tool.

IMPACT OF NONCOMPLIANCE

Failure to collect and record actual costs (ACWP) in the same period the work is accomplished (BCWP) negates the validity of the cost variance and prevents accurate and effective performance management.

16.A.4. ARE DIRECT COSTS RECORDED IN THE CONTROL ACCOUNT ON THE SAME BASIS AS BUDGETS WERE ESTABLISHED AND, AT A MINIMUM, BY ELEMENT OF COST (EOC)?

The intent of this QE LOI is to determine if actuals are recorded consistent with corresponding budget and performance.

This means literally that the effort should be charged to where it is budgeted. It does not require that the EOCs in the accounting system match the EOCs in the EVM Cost Tool. However, in no case must the accounting EOCs be changed when input into the EVM Cost Tool. EOCs will typically vary over time. There is no expectation that the budget be changed if an EOC is not charged or charged differently. The CAM should understand the charges by EOC and be able to explain the differences in variance analysis. The CAM has the option to change the future plan beyond the freeze period if the variances by EOC are significantly distorting the performance. EOCs are very relevant to how ETCs and EACs are calculated.

IMPACT OF NONCOMPLIANCE

Failure to accrue cost by EOC in the same WP/activity as budget would invalidate variance analysis and inhibit the EAC generation.

16.A.5. ARE ACWP VALUES IN THE EVM COST TOOL RECONCILABLE TO THE IPMR/CPR AS APPLICABLE?

The EVM Cost Tool is reconciled with the IPMR/CPR and must contain the same ACWP values for the current month. The EVM Cost Tool is reconciled with the accounting system in QE LOI 16.A.1. The EVM Cost Tool has estimated actuals, if any, added and reconciled. Therefore, the values in the Cost Tool must be used as the basis for external reporting to the DOE customer in PARS II and the IPMR/CPR. All three sources must contain the same ACWP values for the current month and cumulative to date.

IMPACT OF NONCOMPLIANCE

Irreconcilable performance data adversely impacts the credibility of performance being reported to the customer.

16.A.6. ARE NEGATIVE ACWP VALUES (IF ANY) INFREQUENT, JUSTIFIED, APPROVED, AND ARE SIGNIFICANT ADJUSTMENTS TO ACWP ADDRESSED IN FORMAT 5 OF THE IPMR/CPR?

Contractors use journal vouchers or cost corrections to make accounting adjustments for accounting errors, cost transfers, etc. These vouchers or corrections must be authorized and processed as quickly and as consistently as possible before accounting month-end in order to provide current and correct accounting data for performance measurement. Where a significant journal voucher or cost correction is delayed, estimated actuals must be accrued if warranted.

This QE LOI also addresses that negative ACWP in the prime system should be unusual, consistent with the disclosure statement, and discussed with DOE. Negative adjustments in this context are adjustments to prior period data. Routine approved cost transfers in the current month are not a concern in this QE LOI unless frequent and excessive. This QE LOI is assessed at all WBS levels.

IMPACT OF NONCOMPLIANCE

Excess negative actual cost adjustments indicate a lack of process controls and EVMS integrity.

16.A.7. ARE ESTIMATED ACTUAL COSTS (ACCRUALS) REVERSED TO AVOID DOUBLE COUNTING?

When direct costs for labor, subcontracted effort and/or material have not yet been formally recorded in the accounting system, estimated costs (estimated actuals) are used for EVM performance reporting and assessment in the EVMS. This estimate is to address timing differences between the accounting system and performance reports. Once actual direct costs have been recorded in the accounting system, the intent of this QE LOI is to ensure estimated costs (estimated actuals) will be reversed in the EVMS to avoid double counting. Material direct cost accumulation is further addressed in Guideline 21. All estimated costs (estimated actuals) used for performance reporting must be reconcilable between the General Ledger and the EVMS.

An example will help illustrate the concept. Because BCWP and ACWP are cumulative, the timing difference may no longer exist in the following month. So the need for estimated actuals must be reevaluated in the following month. Estimated actuals are typically booked in the EVM Cost Tool and not in the accounting system. Therefore, the recommended process in the EVM Cost Tool is to record the estimated actual cost in the current month, and record a negative offset in the following month. The next step in the process is to reevaluate the requirement for estimated actuals the following month and reapply those necessary and continue with the same process each month until the difference is no longer required. Once the accounting system records the actual cost, the value of the estimated actual is reduced to zero. This process ensures that ACWP for the current and cumulative periods is reported correctly and not double booked (see Fig. 15).

Month	Period 1	Period 2	Period 3	Total
Estimate 1	+$10,000	($10,000)	0	0
Estimate 2		$10,000	($10,000)	0

Figure 15 - Estimated Actuals Example

In the first month of the example, BCWP was $12,000, but no actual costs were reported from the accounting system. Because this difference would result in a significant false positive cost variance, an evaluation was performed. A cost entry of $10,000 for the work completed was not accrued in the accounting system, so an estimated actual of $10,000 was placed in period 1 and offset with a negative in period 2. This means the cumulative cost in month 1 is $10,000 and the cumulative for period 2 is $0 as reported in month 1. Since it is still period 1, it is anticipated the cost entry will accrue in the next accounting month. In month 2, the cumulative BCWP is still $12,000, and ACWP is $0. So estimated actual 2 is accrued in months 2 and offset applied in month 3. This process is repeated until the actual cost entry of $10,000 is reported in the accounting system.

IMPACT OF NONCOMPLIANCE

Failure to reverse estimated actuals when corresponding actual costs are recorded results in erroneous cost reporting, false variances, and incorrect EACs.

16.B. SUBSECTION - ACCOUNTING RECONCILIATION WITH SOURCE SYSTEMS

The accounting system is the book of record for actual cost collection. It typically produces or is integrated with the pay system and has employee salary information. There are various source records that are inputs such as time cards, material purchase orders, payments that are inputs or cost source put into the accounting system. For EVM Cost Tool actuals to be credible these source records must be valid, approved, reconciled, and auditable. These QE LOIs discuss this in detail.

QE LOI DISCUSSION

16.B.1. FOR MATERIAL PROCUREMENTS, DOES THE SYSTEM PROVIDE COMMITMENT, RECEIPTS AND, IF APPLICABLE, USAGE?

The purchasing system typically has separate approvals. There are a number of basic documents that impact the EVM process.

- Purchase Request– an engineering document that specifies the technical requirement. If the Purchase Request is significantly different than the Bill of Material (BOM) costs, then the CAM should identify an EAC impact for the anticipated value in the EVM Cost Tool.
- Purchase Order – this acquisition document to be sent to the source, is generated by the purchasing office and must generated by Purchasing and needs to be compliant with all federal laws regarding sources. At this point, an evaluation should be made to determine the commitment amount that should be accrued in the accounting system with respect to the terms and conditions of any multi-year contracts and their impact on the execution year. This analysis must be done to identify the appropriate value to be represented in the EVM Cost Tool. The EAC should also be updated for the difference, if any, between the BOM or estimated price and the final acquisition price.
- Purchase Receipt – This document includes inspection and is the receipt documenting acceptance. Generally, this acceptance is the point in which BCWP is claimed for HDV material. At this point, the obligation to pay should be accrued in the accounting system or as an estimated actual based on the quantity received multiplied by the purchase order price.
- Vendor Invoice – This document is needed before accounts payable can write a check and actuals hit the accounting book of record. Accounts payable usually requires the purchase order, the purchase request and the vendor invoice to verify material, quantity and dollar amount in order to make an accurate payment to the vendor.

- Inventory Usage Documentation – The accounting system must account for the cost of material used to include scrap, rework, test rejections and unanticipated test quantities. Also see guideline 20 for usage requirement.

At all times, these source records must be traceable and reconcile with the accounting commitment, obligations, actual values, and the EVM Cost Tool earned value (BCWP) assessments, and ACWP values (with estimated actuals if required).

IMPACT OF NONCOMPLIANCE
Failure to reconcile the purchasing system, the accounting system and the EVM Cost Tool could understate the EAC reported to DOE and impact contractor funding requirements.

16.B.2. DOES THE CONTRACTOR ACCRUE ACTUAL COSTS FOR THE SUBCONTRACTOR IN A MANNER THAT REFLECTS THE ACTUAL WORK PERFORMANCE?

Subcontractor costs are normally based on progress payments, invoices, milestone, or subcontractor schedule of values. In some cases, the actuals in the accounting system may not represent 100% of the cost associated with the work completed by the subcontractor for a specified period of time. This period may be because of lagging invoices or payment timing, or contractual withholds.

Direct subcontractor costs that have not been formally recorded in the accounting system (because of lagging invoices, etc.), direct or as an accrual, must be recorded in the EVM Cost Tool as estimated actuals for the ACWP in the same period as BCWP. Estimated actuals are reconciled to the accounting records each month to adjust for Invoices received, paid and actual cost recorded. Once direct costs have been recorded, the actual costs replace the estimated actuals recorded in the EVMS.

The source record for subcontract estimated cost is typically the subcontractor ACWP reported in their earned value reports. Generally, there is up to a one-month lag that must be accrued as an estimated actual.

IMPACT OF NONCOMPLIANCE
Failure to ensure subcontractor actual costs (direct or estimated actuals) are consistent with work performed results in inaccurate cost variances and EACs.

16.B.3. ARE ACCOUNTS PAYABLE RECONCILABLE OR USED AS A SOURCE FOR ESTIMATED ACTUALS?

Accounts payable may not have been accrued in the accounting system until payment. Accounts payable are obligations that are not yet paid. However, BCWP must be based on the period when work is completed. Therefore, accounts payable, if any, where significant, must be reviewed to see if lagging actuals (ACWP) are present and should be recorded as estimated actuals. Accounts payable must be reconciled with the source documents for earned value claimed (BCWP, such as material receiving reports) and accounting system direct actual costs to determine if actual costs have been booked or not.

IMPACT OF NONCOMPLIANCE

Lack of reconciliation between accounts payable and ACWP may significantly understate the reported ACWP and result in inaccurate cost variances, EACs, and EVM performance reporting.

16.B.4. ARE ANOMALIES IN ACTUAL COST (INCORRECT CHARGES, TRANSFERS, ETC.) THAT ARE IDENTIFIED BY THE CAM, CORRECTED IN A TIMELY MANNER?

Anomalies in actuals identified by the CAM must be corrected during the cost reconciliation period. The month-end actual cost reconciliation is normally 1–5 working days after the accounting month-end. A defined process and documented timetable helps ensure valid cost performance measurement for work performed and/or material purchased.

IMPACT OF NONCOMPLIANCE

Failure to correct anomalies in actual costs in a timely manner (before performance reports are released) results in inaccurate cost performance measurement, cost variances and may result in an inaccurate EAC reported to the DOE.

GUIDELINE 17 - SUMMARIZE DIRECT COSTS BY WBS ELEMENTS

WHEN A WORK BREAKDOWN STRUCTURE IS USED, SUMMARIZE DIRECT COSTS FROM CONTROL ACCOUNTS INTO THE WORK BREAKDOWN STRUCTURE WITHOUT ALLOCATION OF A SINGLE CONTROL ACCOUNT TO TWO OR MORE WORK BREAKDOWN STRUCTURE ELEMENTS.

PURPOSE OF THE GUIDELINE

To assure that accurate cost data is being reported throughout the various levels of the WBS and provides project management with the confidence that the data is reliable.

MANAGEMENT VALUE OF THE GUIDLINE

Accurate cost summarization by WBS element provides management visibility into the current cost of products and services being procured. Accurate accumulation and summarization of direct costs support effective analysis of performance measurement information and forecasting of potential future costs.

At a minimum, direct costs are collected at the control account level and summarized to successively higher WBS levels for reporting and performance measurement purposes. To prevent distorting the data and the related assessments of performance, internal controls are put in place to ensure that direct costs collected within control accounts are accurately summarized up through the WBS without being allocated to two or more higher level WBS elements. The charge number structure uniquely relates direct costs to control accounts and facilitates the summarization of costs by the WBS. This practice assures direct costs will be summarized and reported only within a single WBS element. Validity of the resulting performance metrics enhances management's ability to make programmatic decisions and properly forecast future costs for the remaining work.

IMPACT OF NONCOMPLIANCE

Data and the related assessments of performance measurement would be distorted and would not support effective analysis of performance measurement information and forecasting of potential future costs.

QE LOI DISCUSSION

17.A.1. CAN DIRECT COSTS BE SUMMARIZED BY ELEMENT OF COST, FROM THE WP/CHARGE NUMBER LEVEL THROUGH THE WBS HIERARCHY?

This QE LOI verifies that actual direct costs are summarized through the WBS to the total project level while preserving the EOC integrity. Direct costs are collected, at a minimum, at the CA level and summarized to successively higher WBS level for reporting and performance measurement purposes. To prevent distorting data and related assessments of performance, internal controls are in place to ensure that direct costs collected within CAs are accurately summarized up through the WBS without being allocated to two or more higher level WBS elements. Assurance that accurate cost data is being reported throughout the various levels of the WBS provides project management with the confidence that the data is reliable. Validity of the resulting performance metrics enhances management's ability to make programmatic decisions and properly forecast future costs for the remaining work.

As defined in Guideline 5, the CA is at the intersection of the WBS and OBS. Charge numbers are required in G/L 16 at the CA level and recommended at the WP level (if actual costs are to be collected at that level). Regardless, the actuals should summarize successfully so that no actual charge numbers are at higher levels and the EOC traceability is maintained in the summarization. The contractor's charge number structure uniquely relates direct costs to the CAs' work performed (and WPs within the CAs if costs are collected at that level) and facilitates the summarization of those costs by the WBS. This practice assures direct costs will be summarized and reported only within a single WBS element and the costs are directly related to the work performed.

IMPACT OF NONCOMPLIANCE

Failure to summarize direct costs by WBS prevents the system from ensuring the direct costs reflect the costs associated with accomplishing the scope of work and would result in inaccurate reporting at various WBS levels. If direct costs are not required to be allocated to only one WBS element, the costs in a WBS element would not be directly related to the work performed and performance assessments would be distorted.

17.A.2. DOES THE CONTRACTOR DOCUMENT THE RELATIONSHIPS, IF ANY, BETWEEN SCHEDULE ACTIVITIES, CHARGE NUMBER (ACCOUNTS), WPs AND CONTROL ACCOUNTS?

The IMS is the source for work effort and integration between systems. When resources are physically maintained in the IMS, the data transferred from scheduling systems to EVM Cost Tool may be automated which eliminates redundant effort and/or human error in the data transfer. In a non-resource loaded schedule, the IMS activities should be mapped to the WP through coding to preserve cost and schedule integration, and to ensure traceability and consistency between the systems. In the IMS Supplemental Guidance, and or the IMS Data Dictionary, the mapping and coding relationships between the schedule and the EVM Cost Tool must be detailed and outlined.

The Accounting system contains the charge numbers used to collect actual costs and should include the WBS/cost collection mapping showing the relationship between charge numbers and CAs and/or WPs. The EVM Cost Tool may include activities from the schedule, if resource loaded, but will contain CAs and WPs. The mapping or coding relationships between the EVM Cost Tool, the IMS, and Accounting system direct cost collection must be detailed and outlined per the process.

The key to this QE LOI is that the relationships and levels, if any, between each system must be documented. For example:

- Are charge numbers at or below the WP, or at the CA level?
- Are schedule activities at or below the WP level?
- What codes or methods are used to ensure activities and charge numbers are related to WPs and CAs?

IMPACT OF NONCOMPLIANCE

Lack of documentation regarding relationships between activities and charge numbers with WPs/CAs leads to errors in reporting which can impact data validity, analyses, EACs, funding requests and availability.

Note: The level of actual costs, CA or WP, is a function of the level at which the charge numbers are established. The "requirement" is for actuals to be collected at the CA level at a minimum. (See GL 16).

GUIDELINE 18 - SUMMARIZE DIRECT COST BY OBS ELEMENTS

SUMMARIZE DIRECT COSTS FROM THE CONTROL ACCOUNTS INTO THE ORGANIZATIONAL ELEMENTS WITHOUT ALLOCATION OF A SINGLE CONTROL ACCOUNT TO TWO OR MORE ORGANIZATIONAL ELEMENTS.

PURPOSE OF THE GUIDELINE

To prevent distorting data and related assessments of performance, internal controls are in place to ensure that direct costs collected within control accounts are accurately summarized up through the OBS without being allocated to two or more higher level OBS elements.

MANAGEMENT VALUE OF THE GUIDELINE

Accurate cost summarization by OBS element provides management visibility into current costs incurred by organizational elements in production of the products and/or services. Confirmation that direct costs are accurately accumulated and summarized supports management's effective analysis of performance measurement information and forecasting of potential future resource requirements and their costs. Direct costs are collected, at a minimum, at the control account and summarized to successively higher OBS levels for reporting and performance measurement purposes. The charge number structure uniquely relates direct costs to control accounts and facilitates the summarization of costs by the OBS. This practice assures direct costs will be summarized and reported only within a single OBS element. Assurance that accurate cost data is being reported throughout the various levels of the OBS provides project management with the confidence that the data is reliable. Validity of the resulting performance metrics enhances management's ability to make programmatic decisions and properly forecast future costs for the remaining work.

IMPACT OF NONCOMPLIANCE

Failure to ensure that direct costs are accurately accumulated and summarized would not support management's effective analysis of performance measurement information and forecasting of potential future resource requirements and their costs.

QE LOI DISCUSSION

18.A.1. CAN DIRECT COSTS BE SUMMARIZED BY ELEMENT OF COST, FROM THE CHARGE NUMBER LEVEL THROUGH THE OBS HIERARCHY?

The contractor's charge number structure uniquely relates direct costs to CAs/WPs and facilitates the summarization by the OBS from the accounting system, to the EVM Cost Tool/CAPs, through the IMS, to the WAD, the RAM and OBS. This practice assures direct costs are summarized and reported only within a single OBS element from CA to the Project level.

Actual costs need to be available at all levels of the OBS. As stated in LOI 17.A.1 and defined in Guideline 5, the CA is established at the intersection of the WBS and OBS. The WBS identifies the work and the OBS identifies who performs the work. This QE LOI is exactly like 17.A.1, except that it verifies that actual direct costs are summarized through the OBS to the total project level while preserving the integrity of the EOC. In either case the intent is the same —actual cost collected at the CA level may not be rolled up (i.e., summarized) to multiple higher level elements. This process is accomplished by ensuring the direct costs reported and analyzed at higher levels of the OBS only reflect the costs associated with the authorized resources to accomplish work. Assurance that direct costs are accurately accumulated and summarized to provide valid data

supports management's effective assessment of performance management information and forecasting of potential future resource requirements and their costs. Also see GL 3 – System Integration.

IMPACT OF NONCOMPLIANCE

The direct costs reported and analyzed does not reflect the costs associated with the authorized resources identified to accomplish the work and invalidates management's forecasting of future resource requirements and their costs.

18.A.2. DOES THE CONTRACTOR'S SYSTEM PROHIBIT ALLOCATION OF DIRECT COSTS TO TWO OR MORE HIGHER LEVEL OBS ELEMENTS?

The contractor's charge number structure must uniquely relate the direct costs to CAs/WPs and facilitate the summarization of those costs by the OBS. This practice assures direct costs are summarized and reported only within a single OBS element from the CA/WP to the Project level.

IMPACT OF NONCOMPLIANCE

The costs being reported and analyzed does not reflect the costs associated with the authorized resources to accomplish the work and does not support management's ability to make programmatic decisions and properly forecast future resource requirements.

Note: The level of actual costs, CA or WP, is a function of the level at which charge numbers are established.

GUIDELINE 20 - IDENTIFY UNIT AND LOT COSTS

IDENTIFY UNIT COSTS, EQUIVALENT UNIT COSTS, OR LOT COSTS WHEN NEEDED.

PURPOSE OF THE GUIDELINE

The purpose of the GL is to ensure contractor accounting systems are capable of determining the unit or lot costs of items developed or produced.

MANAGEMENT VALUE OF THE GUIDELINE

This determination is done for cost reporting purposes and to provide visibility into the factors driving project cost growth. The contractor's accounting system must have the capability to produce unit, equivalent unit, or lot costs for cost reporting purposes. Deriving and analyzing changes in unit cost data, especially during production or manufacturing, provides project management insight into the reasons for cost growth or efficiency, and highlights the need for potential changes in how the project is managing cost and schedule. The accounting system must be able to segregate the costs of production units, lots, or equivalent units by elements of cost (i.e., labor, materials, other direct costs, and indirect costs). Additionally, it must distinguish between recurring and nonrecurring costs as required by internal/external reporting requirements. This process will provide project management flexibility to plan, measure performance, and forecast in a more efficient way when there are multiple projects in the production line. Where it is not practical to determine the individual unit costs of items produced, "lot" costs may be accumulated wherein a "lot" represents an aggregate of a specified and consistent number of units. On production contracts where multiple similar units are produced and delivered to different customers, or when units are randomly removed from the production line to support various customer delivery agreements, "equivalent unit costs" (i.e., all things being equal, each unit's cost is approximately equivalent to every other unit's cost) may be established.

IMPACT OF NONCOMPLIANCE

The inability of the contractor's accounting system to be able to identify unit costs, equivalent unit or lot costs by EOC (in terms of labor, material, other direct, and indirect costs (as required by the contract)) limits DOE's ability to ensure there is sufficient funding for contracted units and predict the cost of future procurements.

QE LOI DISCUSSION

20.A.1. DOES THE CONTRACTOR'S SYSTEM HAVE THE CAPABILITY TO PROVIDE UNIT COSTS, EQUIVALENT UNIT OR LOT COSTS IN TERMS OF LABOR, MATERIAL, OTHER DIRECT, AND INDIRECT COSTS AS REQUIRED BY THE PROJECT?

In a production or manufacturing environment, the contractor's accounting system must have the capability to produce unit, equivalent unit, or lot costs for cost reporting purposes.
This QE LOI may not be applicable in a pure construction, engineering design or similar type of project. It is normally required when (a) there are multiple customers funding individual units or lots or (b) there are future procurements of the same items pending and the information will be used to estimate the costs of those units or lots.

Deriving and analyzing changes in unit cost data, especially during production or manufacturing, provides project management insight into the reasons for cost overruns or underruns, and highlights the need for potential changes in how the project is managing cost and schedule.

The accounting system must also be able to segregate the costs of production units, lots, or equivalent units by elements of cost (EOC), (i.e., labor, materials, other direct costs, and indirect costs). If a given unit's cost was determined to be $100,000, it is important to know, for current negotiation postures and future acquisitions, how much of this cost was because of labor, materials, overhead, and other direct charges. When multiple units of the same design are being produced in a manufacturing assemble line environment, it is usually sufficient that the accounting system be able to provide "equivalent" unit costs: i.e., the total cost of all the units divided by the number of units produced.

IMPACT OF NONCOMPLIANCE

The inability of the contractor's accounting system to be able to identify unit costs, equivalent unit or lot costs by EOC (in terms of labor, material, other direct, and indirect costs (as required by the contract)) limits DOE's ability to ensure there is sufficient funding for contracted units and predict the cost of future procurements.

20.A.2. CAN RECURRING OR NONRECURRING COSTS BE IDENTIFIED AS NECESSARY OR WHEN REQUIRED BY THE CONTRACT?

The contractor's accounting system must be able to distinguish between recurring and nonrecurring costs as required by internal/external reporting requirements. Generally, recurring costs are those that would be incurred in continuing production of the product. Nonrecurring costs are those associated with such one-time activities as design development, systems test and evaluation, initial plant layout, training or preparation of technical data and manuals, to name a few. If 50% of a unit's cost of $100,000 was identified as nonrecurring costs, then future negotiations and project acquisition plans could legitimately expect the unit cost in the future to be around $50,000. Identification of recurring and nonrecurring costs on a contract, and more specifically on a unit-cost basis, provides valuable data for estimating the cost of future acquisitions for both the contractor and DOE.

IMPACT OF NONCOMPLIANCE

The inability of the contractor's accounting system to distinguish between recurring and non-recurring costs limits the ability to estimate the cost of future acquisitions for both the contractor and the DOE.

GUIDELINE 21 - TRACK AND REPORT MATERIAL COST/QUANTITIES

FOR EVMS, THE MATERIAL ACCOUNTING SYSTEM WILL PROVIDE FOR:
1) ACCURATE COST ACCUMULATION AND ASSIGNMENT OF COSTS TO CONTROL ACCOUNTS IN A MANNER CONSISTENT WITH THE BUDGETS USING RECOGNIZED, ACCEPTABLE, COSTING TECHNIQUES.
2) COST RECORDED FOR ACCOMPLISHING WORK PERFORMED IN THE SAME PERIOD THAT EARNED VALUE IS MEASURED AND AT THE POINT IN TIE MOST SUITABLE FOR THE CATEGORY OF MATERIAL INVOLVED, BUT NO EARLIER THAN THE TIME OF ACTUAL RECEIPT OF MATERIAL.
3) FULL ACCOUNTABILITY OF ALL MATERIAL PURCHASED FOR THE PROGRAM INCLUDING THE RESIDUAL INVENTORY.

PURPOSE OF THE GUIDELINE

The purpose of this GL 21 is to ensure that material costs are accurately collected from the accounting system and transferred to the Earned Value Management System (EVMS) in order to compare those costs with corresponding budgets and completed work. It is also to ensure reliable performance measurement suitable to the material category and to ensure that all material items purchased for the contract are accounted for through contract completion and final disposition.

MANAGEMENT VALUE OF THE GUIDELINE

The establishment of accurate cost accumulation, performance measurement, and identification of residual inventory is essential since material may comprise a large portion of a contract's costs. Material management must be accomplished in a manner that provides maximum identification of critical or HDV material for effective management visibility. To support project management, direct costs for material items must be assigned to a project consistent with the corresponding budgets for that material. This assignment provides the basis for realistic evaluation of cost variances and ultimately facilitates Estimate at Completion (EAC) projections. (See Guidelines 23 and 27.)

IMPACT OF NONCOMPLIANCE

If material costs are not accurately collected from the accounting system and transferred to the Earned Value Management System (EVMS) the project team would not be able to compare those costs with corresponding budgets and completed work. The EVMS would not produce reliable performance measurement data suitable for the material category and would not ensure that all material items purchased for the contract would be accounted for. This would impact the EVM performance measurement and management. The EAC forecast would not be reliable.

QE LOI DISCUSSION

21.A.1. ARE MATERIAL ACTUAL COSTS RECORDED ON THE SAME BASIS IN WHICH BUDGETS WERE PLANNED AT THE CA LEVEL?

The intent of this QE LOI is that actuals for material are recorded on the same basis as budget and performance are recorded. Material costs must be accurately accumulated within charge numbers and charged to the CA level, at a minimum, using recognized and accepted costing techniques. (Also see Guideline 16). These techniques may vary based upon the way material is brought into CAs. For example, material received directly for work that is in process is normally costed to the CA at the invoice amount.

Materials issued from an inventory storeroom/warehouse may be costed to the CA in several different ways:

- On a Last In, First Out (LIFO) basis in which the most recently received units of each type of material are issued first. In inflationary times this process allows the supplier to cost the higher priced materials (just received) to the contracts in-house while retaining the less inflated priced units in inventory as surplus or back-up commodities.
- On a First In, First Out (FIFO) basis in which the first units received of each type of material are also the first units issued for usage. This method is most beneficial when there are large quantities of materials being used that have a short, specific shelf-life of guaranteed usability.
- On an Average Unit Cost (AUC) basis wherein the units being issued for use are taken from the warehouse in a random order with no regard to their time of receipt. An average cost of each unit of each type of material is maintained and updated as each new shipment of materials is received. Then when a unit of material is issued, the CA receiving the distribution is charged with the average unit cost of that material.

Still other materials may be furnished by the customer. In this case, the Government Furnished Materials (GFM) would be costed at no charge when placed into work that is in process. Regardless of the costing method used, the same basis must be used for both budgeting and applying actual costs for materials. If material is supplied as GFM and accounted for at no charge, then the supplier's plan should reflect this in the material budgets of the affected CAs. If a LIFO material accountability system is used for warehoused materials, then the original CA budgets should be estimated with the ″Last In, First Out″ concept in mind. The way materials are budgeted in CAs is dependent upon the contractor's methodology for accounting for those materials.

IMPACT OF NONCOMPLIANCE

The direct costs for material items are not assigned to a CA/WP consistent with the corresponding budgets for that material and do not provide a valid basis for realistic evaluation of cost variances and realistic Estimates at Completion (EAC) projections to DOE.

21.A.2. IS HDV MATERIAL PERFORMANCE (BCWP) RECORDED IN ONE OF THE FOLLOWING WAYS: 1) UPON RECEIPT OF MATERIAL BUT NOT EARLIER, 2) ISSUE FROM INVENTORY, OR 3) CONSUMPTION OF THE MATERIAL?

Budgets for critical or high-value material, must be planned discretely using objective milestones or other rational basis for measuring the amount of material consumed. This process would include multiple deliveries of the same item for which a series of sequential milestones would be listed. For inventory material, the contractor may choose a percent complete, a milestone for each "kit" of material issued to work in process (WIP), or another EV technique that accurately reflects the issuance to this type of material. For material that will be released in kits, determine how BCWP and ACWP are determined at the time of partial kit releases.

Performance for HDV/critical material items may be planned (BCWS) and claimed (BCWP) based upon receipt, inspection, and acceptance, provided the material items are placed into use within a reasonable time or are specifically identified to a serially numbered end item. This point of performance must be established no earlier than the actual receipt of the material items. This

prevents the early assessment of progress for material that may ultimately be cancelled and for which earned value would have to be reduced.

While progress payments and/or schedule of values alone may not be used for progress assessment, technical and/or quantifiable backup data used to document performance may be used as objective milestones. The reason is that progress payments and schedule of value are not schedule accomplishments. It is the technical progress that must be used for earned value.

There may be situations where the contractor may offset the planning of material budgets (BCWS) to coincide with the payment of the vendor's invoice. This offset is done primarily to ensure that BCWP for the material and the costs for that material are reported within the same accounting period. This approach is acceptable only if (a) the actual consumption of the material occurs within a reasonable time frame of the payment (usually 30 days or one accounting period), and (b) it is not used as an across-the-board approach to material BCWP management for all categories of material.

IMPACT OF NONCOMPLIANCE
Failure to track HDV material may cause overall project delays.

21.A.3. DOES THE MATERIAL OR OTHER SYSTEM PROVIDE FOR THE ACCOUNTABILITY FOR MATERIAL PURCHASED FOR THE PROJECT?

All material purchased or furnished as Government Furnished Material (GFM)/Government Furnished Equipment (GFE) must be fully accounted for on a particular project. If you have a material control system approved by DOE in good standing the intent of the QE LOI may be met. If the report provided covers the scope of this QE LOI then additional verification may not be required. If this is not met, then records must be kept to provide for full and complete accountability of all materials purchased for the project or furnished as GFM/GFE. This material does not include usually trivial scrap such as excess concrete from a pour. Security may prohibit return of residual material. Unused, scrap, and residual is interpreted within normal construction process. Not included as residual are items not useful for future projects and excess normally.

These records must reflect the acquisition, issue to CAs, return of unused materials from CAs, valuable scrap quantity and disposition, and residual material inventory. Normally, any unused material should be returned to stores/warehouse for disposition. Actual direct material costs include the materials in the final product, scrap, damaged materials, and so forth, plus any material purchased for the contract but not used, for which an alternate use cannot be found, and any residual inventory. However, unit cost projections for follow-on procurements must include material consumed plus material requirements for schedule assurance based on waste and spoilage trends determined from an appropriate phase of the contract performance.

IMPACT OF NONCOMPLIANCE
Without full material accountability, requirements may increase material cost.

21.A.4. DOES THE MATERIAL SYSTEM ADDRESS THE VARIOUS METHODS OF CHARGING MATERIAL COSTS FROM INVENTORY, IN ACCORDANCE WITH THE CONTRACTOR'S PROCEDURES?

Material costs must be accurately accumulated within charge numbers using recognized, acceptable costing techniques identified in the contractor's CAS Disclosure Statement. These methods may vary based upon the way the material is brought into the CAs. As previously noted, materials issued from an inventory storeroom/warehouse, may be costed to the using CA in several different ways: (1) the LIFO basis; (2) the FIFO basis; or (3) the AUC basis.

Regardless of the costing method used, the same basis must be used for both budgeting and applying actual costs for materials. If a LIFO material accountability system is used for warehoused materials, then the original CA budgets should be estimated with this "Last In, First Out" concept in mind. The way materials are budgeted for in CAs must be dependent upon the supplier's methodology for accounting for those materials.

IMPACT OF NONCOMPLIANCE

The actual material costs for material issued from inventory is not accurately accumulated and assigned to the appropriate CAs and the cost variances and EACs are invalid.

21.A.5. DOES THE CAM ADDRESS PRICE/USAGE ANALYSIS ON HDV MATERIAL?

Analyzing and determining cumulative and current HDV material CVs and projected HDV material Variances at Completion (VACs) can provide important, continuing internal measurement. HDV material CVs and VACs can be divided into two sources or causes: price variance (PV) and usage variance (UV).

Price Variance: PV is the difference between the budgeted cost for the BOM (based upon engineering drawings and technical orders, etc.), including planned quantities for testing and scrap, and the price paid for the BOM. The PV can be determined early in the contract as HDV materials are ordered and used in projections of the VAC. The PV is of prime importance to those responsible for ordering material. The formula for projecting the PV portion of the HDV material VAC is:
PV = (Budgeted* Unit Price - Actual Unit Price) x (Actual Quantity)
*where 'Budgeted' refers to basis of estimate for the BAC

PV is also important when determining the cause of a cumulative or current period CV. The formula for determining the PV impact to HDV material CV is:
PV = (Earned** Unit Price – Actual Unit Price) x (Actual Quantity)
**where 'Earned' refers to BCWP

Usage Variance: Unlike a PV that can be determined early in the contract when the materials are ordered, UV can occur throughout the period of performance. Normally, UVs are the resultant costs of materials used over and above the quantity called for in the BOM. Certainly, however, there are instances where less material than anticipated in the BOM is used. While the PV is of prime importance to those responsible for ordering HDV material, the UV is of prime concern to those responsible for controlling the quantity of HDV materials used. Planning for material usage allowances to cover scrap, test rejections, unanticipated test quantities, and the like, is a practical

necessity and the supplier should have records of such provisions. The more uncertain the expected usage, the more important it is to have a good plan and to keep track of performance against it (particularly for contract-peculiar materials or materials which require long procurement lead times). Usage analysis is used in projections of the HDV material VAC. The formula for projecting the UV portion of the HDV material VAC is:
UV = (Budgeted* Quantity - Actual Quantity) x Budgeted Unit Price
*where 'Budgeted' refers to basis of estimate for the BAC

UV is also important when determining the cause of a realized HDV material CV in the cumulative or current periods. The formula for determining the UV impact to HDV material CV is:
UV = (Earned** Quantity – Actual Quantity) x (Earned Unit Price)
**where 'Earned' refers to BCWP

IMPACT OF NONCOMPLIANCE
Without material price and usage variance analysis the EAC projections are invalid where applicable.

5.0 ANALYSIS AND MANAGEMENT REPORTS

The Analysis and Management Reporting category focuses on management use of the Earned Value Management System performance data to detect and act upon early technical, schedule, and/or cost deviations from the Performance Measurement Baseline (PMB). The six guidelines (22–27) that comprise this category establish the minimum requirements for generating and analyzing cost and schedule variances (Guidelines 22 and 23), establishing and implementing corrective action plans (Guideline 26), and maintaining credible Estimates at Completion (EAC) at both the control account and total project levels (Guideline 27). The performance data used for variance analysis must be generated from the EVMS. To ensure cost and schedule variances are valid, the EVM method used to derive the BCWP must be consistent with the method used to plan and resource the associated work. (See Guidelines 10 and 12.) The applicable actual direct costs must map or trace to the accounting system. (See Guidelines 16 and 21.) These minimum requirements facilitate the Control Account Managers' (CAMs') ability to identify significant cost and schedule performance drivers and use that information to make informed programmatic decisions that will optimize the use of resources to accomplish the remaining work.

Consideration of the impact of indirect cost performance on the overall cost of the project is also included in this category. The guidelines require analysis of indirect cost performance and their impacts to the Estimates to Complete (ETC) for the remaining work (Guideline 24 — see Section 7.0 Indirect Guidelines). The guidelines further require the performance data to be accurately summarized from the control account level to the contractually mandated reporting level so that the same data being used to internally manage and execute the project is being communicated externally to the government (Guideline 25.) This level of reporting ensures that all project stakeholders are informed of progress and allows for management action to address identified problems and/or risks to project execution (Guideline 26). Lastly, the guidelines require the contractor to periodically evaluate and update ETCs and derive control account and project level EACs that reflect a valid projection of project cost.

Timely and reliable EACs provide the contractor PM visibility into future resource needs and support the government's ability to provide sufficient funding to the project (Guideline 27).

GUIDELINE 22 - CALCULATE SCHEDULE VARIANCE AND COST VARIANCE

AT LEAST ON A MONTHLY BASIS, GENERATE THE FOLLOWING INFORMATION AT THE CONTROL ACCOUNT AND OTHER LEVELS AS NECESSARY FOR MANAGEMENT CONTROL USING ACTUAL COST DATA FROM, OR RECONCILABLE WITH, THE ACCOUNTING SYSTEM:

- COMPARISON OF THE AMOUNT OF PLANNED BUDGET AND THE AMOUNT OF BUDGET EARNED FOR WORK ACCOMPLISHED. THIS COMPARISON PROVIDES THE SCHEDULE VARIANCE.
- COMPARISON OF THE AMOUNT OF THE BUDGET EARNED AND THE ACTUAL (APPLIED WHERE APPROPRIATE) DIRECT COSTS FOR THE SAME WORK. THIS COMPARISON PROVIDES THE COST VARIANCE.

PURPOSE OF THE GUIDELINE

The emphasis of this Guideline depends on accurate cost and schedule performance data generated on a routine basis. In order for project management to assess both progress and variances as compared to the baseline, reliable and auditable data must be generated in a timely manner, on a monthly basis at a minimum in alignment with the contractor's accounting reporting periods.

MANAGEMENT VALUE OF THE GUIDELINE

For analysis and variance reporting, the following data elements must be identified, on a periodic basis, at the CA level:

- Budgeted Cost for Work Scheduled (BCWS), represents the amount of work planned.
- Budgeted Cost for Work Performed (BCWP), represents the amount of work actually accomplished.
- Actual Cost of Work Performed (ACWP), represents the actual cost of the work accomplished traceable through the accounting system.
- The comparisons of BCWP versus BCWS, and BCWP versus ACWP, results in two variances:
  - BCWP minus BCWS results in the CA′s Schedule Variance (SV).
  - BCWP minus ACWP results in the CA′s Cost Variance (CV).

IMPACT OF NONCOMPLIANCE

Project management would not be able to assess schedule and cost performance and provide valid, reliable information to make timely and accurate management decisions.

QE LOI DISCUSSION

22.A.1. IS INFORMATION GENERATED ON A MONTHLY BASIS AT A CONTROL ACCOUNT LEVEL (AT A MINIMUM), AND DOES IT INCLUDE SCHEDULE VARIANCE, COST VARIANCE, AND VARIANCE AT COMPLETION?

Schedule and cost variances are calculated using performance data generated from the EVM Cost Tool and are used to assess deviations from the Performance Measurement Baseline (PMB). At a minimum, cost and schedule variances are calculated at the control account level on a monthly basis for analysis and variance reporting. As work is progressed and statused based on assigned earned value techniques, the corresponding budget value is "earned" and is represented as the Budgeted Cost for Work Performed (BCWP).

This represents the project performance to plan. (See Guidelines 7 and 10). The applicable actual direct costs must map or trace to the accounting system. Using BCWP as a basis of work achievement, BCWP is compared to the planned Budgeted Cost for Work Scheduled (BCWS) and the Actual Cost of Work Performed (ACWP) resulting in the calculation of schedule and cost performance status:

- BCWP minus BCWS results in the CA′s Schedule Variance (SV).
- BCWP minus ACWP results in the CA′s Cost Variance (CV).

Differences between the Budget at Complete (BAC) and Estimate at Completion (EAC) projections (see Guideline 27) result in the Variance at Completion (VAC). The VAC is calculated at the control account, at a minimum, and Summary Level Planning Package (SLPP) level. An analysis of the difference should include what underlying elements of work caused the deviation from the BAC, and what corrective actions, if any, are being implemented to minimize the cost overruns.

- BAC minus EAC results in the CA's Variance at Completion (VAC).

The resulting variance analysis will provide early insight into schedule and cost status for improved visibility of project performance. (See Guideline 23.)

IMPACT OF NONCOMPLIANCE

Unless variances are calculated and analyzed routinely using EVM data, project management is unable to accurately assess the impact of deviations from the Performance Measurement Baseline (PMB).

22.A.2. ARE THE FORMULAS TO CALCULATE SV, CV, AND VAC CONSISTENT WITH CPR/IPMR INSTRUCTIONS?

The DOE Gold Card includes standard formulas for calculating CVs, SVs and VACs which must be followed to ensure accurate variances are being reported. The formulas follow:

- CV = BCWP - ACWP
- SV = BCWP - BCWS
- VAC = BAC - EAC

IMPACT OF NONCOMPLIANCE

Use of analysis based on variances generated by non-standard formulas will result in a lack of standardized reporting, resulting in management being compromised in their ability to accurately identify and report areas in need of attention.

22.A.3. IS THE MEASUREMENT OF COST AND SCHEDULE PERFORMANCE CONSISTENTLY APPLIED THROUGHOUT THE PROJECT?

It is important that the fundamentals of EVM are applied consistently across all CAs, and through the various levels of the WBS and OBS. The contractor's EVMS SD describes the implementation of an EVMS compliant method of project management. Following the SD ensures that all project team members understand the methodology to measure and report EVM performance using the same methods.

IMPACT OF NONCOMPLIANCE

When the fundamentals of EVM are not standardized across the project, management is unable to make effective project management decisions based on the information provided or use the predictive capability of the EVM data to identify project risks and opportunities.

22.A.4. DOES THE CONTRACTOR PERFORM ANALYSIS AT THE LOWEST LEVEL WHERE BCWS IS PLANNED, BCWP IS EARNED, AND ACWP IS COLLECTED?

The contractor's SD or procedures describe the process for calculating CVs, SVs, and VACs. In order to determine the variances, three variables (BCWS, BCWP and ACWP) must be available and be aligned with the exact same scope of work. The contractor must determine the level that provides sufficient visibility to determine the root causes of the variances (whether it is at the control account level or below).

Data must be provided to the CAMs that show a breakout by element of cost (EOC), which is typically one level below the level of planning (WP). For example, analysis of a labor WP's cost variance should include analysis of the labor hour usage, labor rates, etc. In another example, analysis of a material WP's schedule variance should include analysis by material type, other direct costs, etc. Root cause analysis at the right level allows for correct identification of cost and schedule drivers, leading to effective corrective action planning (See Guideline 26).

The guidelines do not mandate collection of actual costs below the control account level. However, analysis of cost variances by element of cost should be done at the lowest possible level. Additionally, schedule variance analysis must also be performed at the lowest level where BCWP and BCWS can be compared, with additional insight gained through analysis of work progress for activities/activities in the IMS at the lowest level.

IMPACT OF NONCOMPLIANCE

Without analysis at the lowest levels, trends are not managed to minimize the impacts at the higher levels.

22.A.5. ARE BCWP CALCULATIONS CONSISTENT WITH THE MANNER IN WHICH THE WORK IS PLANNED?

To ensure cost and schedule variances are accurate, the EVT used to derive BCWP must be consistent with the method used to plan and resource the associated work (See Guidelines 10 and 12.). In simple terms, that means that the CAM must use the same method when claiming performance.

A simple example would be a WP having the scope to build a concrete wall which is scheduled to take four months to complete. The steps include site prep, building the forms, pouring the concrete and removing the forms. Planning the work over four months lends itself to the milestone method that allows progress to be measured every month. When claiming performance at the end of the month, the CAM should determine if all work that defines the milestone was completed. If yes, then the milestone is claimed.

If the percent complete methodology had been used to plan, the CAM should have established and documented quantifiable back up data (QBD) for objective work measurement. This method is typically done in a spreadsheet, although any method is acceptable as long as it is documented and followed consistently. At the end of the month, the CAM evaluates work status and updates the QBD to determine BCWP. If a 50/50 EVT were selected, progress (BCWP) could only be claimed when the effort started and when it was completed. This process would not provide the ability to claim BCWP during the interim monthly reporting cycles while ACWP was still being reported. It is important to select an EVT that reflects the way the work is planned in order to accurately report progress and avoid the creation of artificial variances.

There are two principles that guide BCWP calculations:

1. Care must be taken to select the appropriate EVM measurement technique (EVT) when planning the control account or WP. The intent is that the resulting BCWP determinations objectively reflect true work performance.
2. The established methodology must be followed consistently to claim performance, i.e., the technique may not be changed midstream in an open WP, even it results in better performance data.

Analysis based on variances generated from improperly planned earned value results in inaccurate performance measurement information and the resulting lack of management insight. The prime contractor has responsibility for the entire project work scope, including the subcontracted effort. The prime contractor assigns a CAM to manage the subcontracted effort and to ensure the subcontractor's performance is accurately reported (see guideline 2). If the CAM disagrees with a subcontractor's measurement of progress, the CAM must document the discrepancy and report progress as accurately as possible. Any differences between what the subcontractor reports to the prime as progress (BCWP), and what the CAM deems the "adjusted" BCWP value, must be documented in accordance with company guidelines.

As discussed elsewhere, actual costs are not adjusted except for routine accounting adjustments or correction of errors. The prime contractor CAM may adjust BCWS, BCWP, and EAC as necessary, with justification and documentation. Fee for the subcontractor is considered a cost for the prime contractor. Therefore, the prime contractor must have WPs identified for subcontract fee, if any. These WPs need to have realistic BCWP commensurate with how the fee is earned.

IMPACT OF NONCOMPLIANCE

Without an independent assessment of subcontractor status, the overall project performance may be overstated or understated.

22.A.6. FOR SUBCONTRACTORS WITHOUT AN EIA-748 EVMS FLOW DOWN REQUIREMENT, DOES THE PRIME CONTRACTOR ASSESS SUBCONTRACTOR PERFORMANCE BASED ON A PLAN CONTAINING OBJECTIVE INDICATORS FOR MEASURING SUBCONTRACTOR PERFORMANCE?

If the subcontractor does not have an EIA-748 EVMS flow down, the prime contractor CAM must establish a plan with the subcontractor to objectively measure subcontractor performance. The resulting baseline will support project deliverables, while incorporating objective measurements of

progress aligned to expenses billed to the prime contractor. Objective indicators may be the subcontract statement of values, technical milestones, and periodic deliveries. However, the objective indicators must be based on actual work performance and not payment considerations.

This statement typically takes the form of a statused schedule from the subcontractor, with pre-determined values for milestones and deliverables. The prime contractor CAM should analyze this schedule and verify performance against technical indicators and progress as indicated in technical status reports, delivery reports, and technical meetings.

IMPACT OF NONCOMPLIANCE
When the prime contractor fails to plan the subcontractor effort with objective indicators, a part of the project has inadequate information to make quality decisions about performance.

22.A.7. ARE VARIANCE THRESHOLDS IDENTIFIED AND DOCUMENTED IN THE EVM PROCEDURES?

The contractor must establish and document internal variance thresholds that support external reporting thresholds. Typically, variance thresholds are specified in the DOE PEP, e.g., +/-10% and/or a dollar threshold. Whether or not external reporting thresholds are specified in the project documentation, the contractor's SD and processes should contain a statement to the effect that internal variance thresholds established on the project must be in sufficient detail to support any external EVM reporting. Some contractors also establish internal variance thresholds that are applied in the event that contractual thresholds are not specified, and these may be documented in project specific directives. There are three earned value thresholds that must be defined: Current Month, Cumulative cost and schedule variances; and At-Complete Budget verses EAC variances that require justification when exceeded.

IMPACT OF NONCOMPLIANCE
Failure to establish and document variance thresholds for reporting purposes results in the inability to perform effective variance analysis for internal and DOE reporting.

22.A.8. DO CAMs DEVELOP VARIANCE ANALYSIS AND OBTAIN THE APPROPRIATE MANAGEMENT APPROVALS?

Control account managers (CAMs) have the sole responsibility to plan and manage their assigned CAs, including the requirement to analyze performance and document the variance analysis in the VAR. While others, such as team members and project control analysts, may assist in this process, the CAM ultimately has the responsibility to develop the VAR. The CAM must then initiate the approval cycle as the first approval on the VAR. The contractor must establish in written guidance the subsequent approval authorities. This typically includes the CAM, the CAM's functional manager (as reflected on the OBS), project control analyst, and contractor PM.

IMPACT OF NONCOMPLIANCE
Allowing personnel other than the CAM to develop the VAR may result in poor analysis and failure to identify the root causes and develop effective corrective actions. Failure to approve the VAR by the appropriate individuals may result in poor quality VARs and management not being properly informed of ongoing issues.

GUIDELINE 23 - ANALYZE SIGNIFICANT VARIANCES

IDENTIFY, AT LEAST MONTHLY, THE SIGNIFICANT DIFFERENCES BETWEEN BOTH PLANNED AND ACTUAL SCHEDULE PERFORMANCE AND PLANNED AND ACTUAL COST PERFORMANCE, AND PROVIDE THE REASONS FOR THE VARIANCES IN THE DETAIL NEEDED BY PROGRAM MANAGEMENT.

PURPOSE OF THE GUIDELINE

The ability to analyze deviations from the established plan permits management at all levels to rapidly and effectively implement corrective actions in an effort to regain project/contract objectives.

The majority of accounting and budgeting systems are based on the contractor's accounting calendar. Unless another reporting period is mandated, analysis should be conducted per this same cadence. In accordance with external IPMR/CPR reporting, analysis of CVs, SVs, and variances at completion (VACs) are required to be completed (see GL 27 for more information on VACs).

Performance measurement data, by element of cost, is used to identify trends in cost, schedule, and technical performance. By using this information to determine the root causes of variances, management is better able to address specific problems, and move forward to focus on mitigation as well as cost and schedule projections. This process, like all other parts of the contractor's management system, must be documented in formal operating procedures.

In those cases where no EIA-748 EVMS flow down requirement exists for a major subcontractor, it is necessary for the prime to evaluate subcontractor performance. Formal procedures should document the establishment of subcontractor reporting requirements, as well as validation and review of the subcontractors' performance measurement data submissions by the prime contractor.

MANAGEMENT VALUE OF THE GUIDELINE

Without this visibility into and the understanding of plan deviations, the success of the project can be jeopardized. Additionally, insight into future cost and schedule performance, based on the analysis of variances, will be facilitated. The purpose of this guideline is to ensure both significant SVs and CVs are analyzed, at least monthly, at a level of detail required to manage the effort; i.e., to enable management decision-making and corrective action.

IMPACT OF NONCOMPLIANCE

Management would not be able to analyze deviations from the established plan nor effectively implement corrective actions in an effort to regain project/contract objectives. The success of the project can be jeopardized.

QE LOI DISCUSSION

23.A.1. ARE ALL SIGNIFICANT COST, SCHEDULE, AND TECHNICAL IMPACTS TO THE CONTROL ACCOUNT WITH REGARD TO THE CONTRACTOR'S INTERNAL THRESHOLDS DISCUSSED AND DOCUMENTED MONTHLY? ARE VARIANCES ADDRESSED IN THE DETAIL NEEDED BY PROJECT MANAGEMENT?

Analysis of cost and schedule variances and variances at completion are conducted at the control account level on a monthly basis. Once notified that established thresholds have been breached, the CAM is responsible to document and approve formal variance analysis. This analysis provides an early insight into the root causes, impacts, and corrective actions related to cost and schedule challenges, and highlights the potential need for management action to mitigate potential or realized project risks. Analyzing variances at the control account and summary levels enables project management to understand the impact of cost and schedule performance drivers at the point where budget, scope, and resources are actively managed.

In this context root cause is defined as the issue that if addressed would prohibit the variance from reoccurring. Impacts are defined as the impact to the control account and project. Corrective action is how the variance will be mitigated or the EAC updated.

- Narrative Section: The narrative should identify quantitatively the cause of the variance and then identify the root cause(s). The expectation is that the majority of the variance exceeding the threshold is addressed. Current variances should be addressed separately from cumulative variances.
  a. Cost variance (CV): An example is a $100K cumulative cost variance for a labor account may be attributable to $20K indirect rates, $50K to widget technical problems, and $30K to labor rate variances. Analysis discussion should also address elements of cost if significant and whether the CV will continue. For cumulative and current period HDV material CV analysis, refer to Guideline 21 for formulas used to calculate PV and/or UV.
  b. Schedule variance (SV): Analysis of schedule variance should also address the float impact from the IMS. Schedule variance is typically a dollarized representation of schedule performance that does not provide visibility into detailed progress and accomplishment of the milestones and activities required for execution reflected in the IMS. Concurrent analysis of the integrated network schedule(s) is done to determine the status of specific activities, milestones, and critical events and to identify the factors contributing to the dollarized and time-based schedule variance.
  c. Variance at Completion (VAC): Analysis should relate the impact of the ongoing cost variance to the projected VAC. For analysis of VAC HDV material, refer to Guideline 21 for formulas used to calculate PV and/or UV. (See Guideline 27 for more information.)

- Impact: This section should describe the cost and schedule impacts to the control account as well as any impact to programmatic events or other CAs. For schedule variances, the following should be described: the impact to the critical path (i.e., a delay in a critical activity's completion effects the project completion), float, schedule margin (where

applicable), contractual milestones and/or delivery dates. This section should also address the impact to the Estimate to Complete (ETC).

IMPACT OF NONCOMPLIANCE

Without monthly/routine data and variance analysis, management is unable to use the EVM information to make timely decisions or to properly assess project performance.

23.A.2. FOR SUBCONTRACTS WITH AN EIA-748 EVMS FLOW DOWN, IS THE PRIME'S VARIANCE ANALYSIS FOR MAJOR SUBCONTRACTORS CONSISTENT WITH ITS DOCUMENTED EVMS PRACTICE?

Variance analysis of the subcontractor's EVM performance must be conducted regardless of whether the EVMS requirement was flowed down to the subcontractor. A subcontractor with an EIA-748 EVMS flow down must formally implement the EVMS management system and conduct variance analysis for any variances exceeding thresholds. These VARs are then submitted to the prime's CAM for review, concurrence and incorporation into the prime's IPMR/CPR that is subsequently reported to the DOE. If there were no EIA-748 EVMS flow down requirement, the responsible prime contractor CAM must analyze the subcontractor's performance using data such as technical status reports, statused schedules, formal or informal communication, etc. and then document the analysis in the VAR. The contractor's SD and EVM processes/procedures must document the analysis process for subcontractors when EVMS requirements are flowed down or not.

IMPACT OF NONCOMPLIANCE

Without the establishment of an appropriate variance analysis process from the prime and the subcontractor, the lack of a standardized performance assessment may result in undetected deviations from the plan.

GUIDELINE 25 - SUMMARIZE PERFORMANCE DATA AND VARIANCES FOR MANAGEMENT REPORTING

SUMMARIZE THE DATA ELEMENTS AND ASSOCIATED VARIANCES THROUGH THE PROGRAM ORGANIZATION AND/OR WORK BREAKDOWN STRUCTURE TO SUPPORT MANAGEMENT NEEDS AND ANY CUSTOMER REPORTING SPECIFIED IN THE PROJECT.

PURPOSE OF THE GUIDELINE

This Guideline requirement stipulates that EVMS data used for internal management reporting and external customer reporting emanates from the same source, ensuring both the contractor and the Government are using the same database to manage the project.

MANAGEMENT VALUE OF THE GUIDELINE

All the data elements (BCWS, BCWP, and ACWP) are calculated at the CA level and must summarize from the CA level up through the through the WBS and across the OBS to the total contract level without being divided among two or more higher level WBS elements. The success of the summarization process promotes accurate management insight as well as budget integrity and reconciliation. Variance thresholds internal to the Contractor, if specified, may be tighter than the thresholds identified for external reporting.

IMPACT OF NONCOMPLIANCE

If the contractor and DOE are not using the same data from the same database to manage the project, the project could be jeopardized.

QE LOI DISCUSSION

25.A.1. IS PERFORMANCE MEASUREMENT INFORMATION SUMMARIZED FROM THE CONTROL ACCOUNT TO THE PROJECT LEVEL THROUGH THE WBS AND OBS FOR PROJECT MANAGEMENT ANALYSIS PURPOSES?

Projects are structured using a WBS and OBS that define the CAs. These subdivisions of the WBS and OBS ensure an understanding of responsibility for managing and controlling the allocation of resources to the work scope, and provide for consistent analysis from the CA through the WBS and OBS. The WBS and OBS also serve as the structure for summarizing cost accumulation and for reporting the EVMS performance measurement data aligned to scope to the appropriate responsible person. While summary level variance analysis, if required, may differ depending on project requirements, the summary level managers or Project Managers have the same responsibility as CAMs, just at a higher level in the WBS or OBS. While a summary level manager may rely on CAMs to provide the detailed variance analysis applicable to their CAs, they should be cognizant of the cost and schedule performance for their area of their responsibility.

In a compliant implementation, there is only one set of data. Project management must have the same goals, objectives, and deliverables as DOE has placed on the contract. This alignment allows everyone to progress through project execution with the same plans and expectations.

IMPACT OF NONCOMPLIANCE

Inconsistent analysis between CA and project levels masks performance and increases project costs.

GUIDELINE 26 - IMPLEMENT CORRECTIVE ACTIONS

IMPLEMENT MANAGERIAL ACTION TAKEN AS THE RESULT OF EARNED VALUE INFORMATION.

PURPOSE OF THE GUIDELINE

The availability of timely and accurate EVMS data for variance analysis provides management early insight into the magnitude of potential problems. Subsequent management response, by all levels, is required to mitigate the impacts on project objectives.

MANAGEMENT VALUE OF THE GUIDELINE

As a result of routine performance data evaluation, the project's internal reports and reports forwarded to their customer must indicate the overall technical, schedule, and cost impacts of such problems on the project. For effective management control, root cause analysis, impacts, and resulting corrective actions are identified at the appropriate level and then formally tracked to resolution and closure. As appropriate, functional managers who may have overall control over the resource pool may also need to concur with the corrective action.

After a project is baselined, routine updates occur to both resource and schedule information. In addition to confirming start and finish dates, updates should be made to a task's duration length and modifications to relationships (i.e., links) between tasks as and when necessary. The impacts of these changes should be immediately visible throughout the area of the network affected. Schedules are typically updated at the close of each monthly accounting period, and are the responsibility of the CAM and Project Manager. The purpose of schedule float is to prioritize the resources. By having reasonable float (see QE LOI 6.C.5), then float will change with status. The critical path may change on the project as near critical paths slip more than the critical path; schedule float is that indicator. Schedule float that is the least (positive or negative) indicates the activities, based on status, that are now the most critical to complete in order to maintain the overall critical path. Project managers should look at the schedule float changes weekly or monthly as appropriate to understand the work prioritization. Also changes in excessive positive schedule float may indicate a broken link that needs to be fixed.

IMPACT OF NONCOMPLIANCE

If CAMs are not using the IMS to prioritize their work, resource conflicts may result, inefficiencies may increase, and project goals may not be achieved.

QE LOI DISCUSSION

26.A.1. IS THERE EVIDENCE THE CONTRACTOR'S MANAGEMENT USES AND ANALYZES EARNED VALUE INFORMATION (AT LEAST ON A MONTHLY BASIS) AS A PART OF THEIR DECISION-MAKING?

Earned value information must be incorporated into project management reviews with internal manager and the customer. This QE LOI also focuses on the use of EVM information in the decision-making of corporate leadership. Sound project management embraces a consistent and repeatable process that involves monitoring the project, addressing problems, implementing solutions, and following up on effective corrective actions until closure. Implementing corrective actions and assessing the effect is critical to ensuring the success of the project. The project

maintains a monthly cadence or EVMS cycle that uses performance measurement data to manage issues that arise during execution. This monthly rhythm lends itself to reviewing the earned value data, finding variances, determining root causes and the appropriate corrective actions and tracking these actions to closure through a corrective action log. Typically, contractor PMs conduct status meetings, critical path meetings, and risk meetings, all using information from their EVMS.

IMPACT OF NONCOMPLIANCE

If project management does not use the EVM data to manage the project, the result may be projects with poor cost and schedule performance.

26.A.2. DO CORRECTIVE ACTIONS IDENTIFY RISK MITIGATION STEPS, INCLUDING ACTIVITIES TO REDUCE COST/SCHEDULE IMPACTS TO THE PMB. DO THE CORRECTIVE ACTIONS INCLUDE A COMPLETION SCHEDULE AND THE IDENTIFICATION OF PERSON(S) RESPONSIBLE FOR EXECUTING THE CORRECTIVE ACTION PLANS?

Corrective Action Plans should identify risks, specific actions, mitigation steps, completion schedules, and the responsible managers. These plans should be documented in the EVM system. Once corrective action plans are developed, they are documented in the VAR. These plans should identify specific actions that are required, risk mitigation steps, a completion schedule, and identification of the responsible person(s). The plans are documented, implemented, and monitored until resolution of the problem. An effective project management approach should ensure that the individuals responsible for implementing corrective actions have sufficient authority and control over the required resources used to resolve or recover from the performance deviation. Identified cost, schedule and technical risks should be incorporated into a formal risk management process. If variances are unrecoverable, an explanation of the impact on the project should be provided. If corrective action is not taken, then explain how the impact will not adversely affect accomplishment of project objectives.

While there is no requirement for a corrective action log in the guidelines, the corrective actions must be tracked and reflect the problem/cause, the corrective action, the responsible person, estimated completion date and the actual completion date. A corrective action log is typically used.

IMPACT OF NONCOMPLIANCE

Unless corrective actions are identified, scheduled, and assigned to a responsible person, corrective actions and risk mitigation efforts may fail to be implemented.

26.A.3. ARE CORRECTIVE ACTION PLANS THAT ARE GENERATED THROUGH THE VARIANCE ANALYSIS PROCESS TRACKED TO THEIR RESOLUTION AND CLOSURE?

Part of the VAR is documenting corrective action plans to reduce or mitigate the variance. The VAR corrective action must identify the activities, responsible person for implementation, and the estimated completion date. A corrective action log is a best practice that documents and facilitates follow up on the actions through completion (see QE LOI 26.A.2).

IMPACT OF NONCOMPLIANCE
Without tracking to closure, corrective action plans may not be completed and the results of corrective actions are unknown.

26.A.4. DOES THE PRIME CONTRACTOR MONITOR SUBCONTRACTOR CORRECTIVE ACTION(S) THROUGH CLOSURE?

The prime must track the subcontractor corrective actions in the prime's corrective action system. The requirement for EVM may be flowed down to subcontractors based on established DOE policy or an identified critical need. Regardless of whether EVM is flowed down as a requirement to the subcontractor, it is the responsibility of the prime contractor to monitor the subcontractor's performance in the prime's corrective action system. With an EIA-748 EVMS flow down, the prime may coordinate with the subcontractor's variance analysis process. The subcontractor's corrective action system must include the prime CAM as the responsible person for verification of the subcontractor work. Without an EIA-748 EVMS flow down, the prime contractor develops and tracks the corrective actions for the subcontractor from data solely developed by their own EVM data. Regardless of the source, the prime's corrective action system must be maintained through closure for all corrective actions on the project.

IMPACT OF NONCOMPLIANCE
If the prime has not reviewed and approved subcontractors' corrective actions, the lack of oversight may have adverse impacts on the successful performance of the project.

26.A.5. ARE SIGNIFICANT CHANGES IN FLOAT VALUES REVIEWED BY MANAGEMENT?

Float values will change as the schedule is statused or approved changes (e.g., baseline change proposals (BCPs)) are implemented and network relationships are modified. By itself, the EV schedule variance (SV) will not reveal critical path information and should be analyzed in conjunction with network-based schedule information. The SV should be relatable to the schedule status indicated by the contractor's master and subordinate schedules. It is important that the physical value of work be consistent with the boundaries of the project schedule. Combining the CPM analysis of schedule total float (TF) values and schedule performance index (SPI) values provides the project with a comprehensive performance view of the status of a project from an integrated cost and schedule prospective. Large changes in float merit management attention to ensure the float is accurate and errors have not been made. For example, if an activity has float of 23 days in one month, which changes to 75 days in the following month, some change in the schedule construction has occurred. Possibilities range from a CAM reduction in forecast duration in downstream activities, deletion of downstream activities or changes or deletions in logic. The reasons for the change must be researched and understood to validate the ongoing integrity of the schedule dates, and the tools and reports that depend on those dates. Routine schedule metrics including float are recommended monthly for analysis.

IMPACT OF NONCOMPLIANCE
Significant changes in float values between periods may indicate issues with the integrity of the schedule network.

GUIDELINE 27- MAINTAIN ESTIMATE AT COMPLETION

DEVELOP REVISED ESTIMATES OF COST AT COMPLETION BASED ON PERFORMANCE TO DATE, COMMITMENT VALUES FOR MATERIAL, AND ESTIMATES OF FUTURE CONDITIONS. COMPARE THIS INFORMATION WITH THE PERFORMANCE MEASUREMENT BASELINE TO IDENTIFY VARIANCES AT COMPLETION IMPORTANT TO COMPANY MANAGEMENT AND ANY APPLICABLE CUSTOMER REPORTING REQUIREMENTS INCLUDING STATEMENTS OF FUNDING REQUIREMENTS.

PURPOSE OF THE GUIDELINE

Ensure estimates of the cost to complete the remaining requirements on a project are periodically reassessed. A most likely estimate of the total cost for completing all authorized project work is maintained and reflects future impacts and risks/opportunities not yet captured in performance. Estimates to Complete (ETCs) remaining work are time-phased in accordance with the expected completion dates and support funding requirements.

MANAGEMENT VALUE OF THE GUIDELINE

A properly established and maintained Estimate at Completion (EAC) ensures continuing visibility into the cost, schedule, risks and opportunities, as well as the resource requirements (e.g., funding, labor resources, facilities, etc.) and contributes to project success for both the government and the contractor. The Control Account Manager's (CAM) ability to communicate the control account EAC is supported by and traceable from the work package level where resources for remaining work exists. Timely, accurate, reliable, and auditable estimates support the government's ability to sufficiently fund the project and enhance internal management's visibility into critical resource requirements (labor resources, facilities, etc.).

IMPACT OF NONCOMPLIANCE

Would not have visibility into the cost, schedule, risks and opportunities, as well as the resource requirements (e.g., funding, labor resources, facilities, etc.) and would impair project success for both the government and the contractor.

27.A. SUBSECTION - EAC PROCESS OR GENERAL EXPECTATIONS

Developing the Estimate at Completion (EAC) is a crucial part of the project management plan as it provides insight into future resource requirements. The EAC is based on the Actual Cost of Work Performed (ACWP) to date plus the ETC for the remaining incomplete work. EACs are not constrained by funding or negotiated contract costs, but focus on the total projected cost of the project work scope.

The Estimate to Complete (ETC) is developed by element of cost at the WP, planning package and Summary Level Planning Package (SLPP) levels (or lower depending on where resources are identified) for the remaining effort, and are added to the cumulative ACWP to calculate the EAC. This calculation includes evaluating the type and quantity of resources required to complete project objectives. At a minimum, direct costs are collected at the control account level so the calculation of ETC is based on time-phased resources corresponding to the scheduled forecast dates, and is accurately summarized through the WBS and the OBS. On a monthly basis, the CAMs review the status of the expended effort and the viability of the forecast. Subcontractor EACs are included in the prime EAC.

Judicious maintenance of the CA level EAC by the CAM ensures that the EAC reflects a valid projection of project costs. When updates are made to existing forecasts, significant changes are briefed to project management. Internal and external reporting includes the same updates and reflects the same risk and opportunity evaluations.

Annually at a minimum, a comprehensive EAC must be prepared by the CAM assigned responsibility for the work using all available information to formulate the most accurate EAC. A properly established and maintained EAC will ensure continuing visibility into resource needs (resources, materials, etc.) and lead to project success for both the DOE and the contractor. Using the management assigned responsibility for the work scope, accurate estimates by element of cost enhance the contractors' visibility into critical resource requirements.

The To-Complete Performance Index (TCPI) metric must be evaluated to gauge realism of the EAC against the cumulative Cost Performance Index (CPI_{cum}).

- $TCPI_{EAC}$ = (BAC-$BCWP_{cum}$) / (EAC – – $ACWP_{cum}$) = EAC-based To-Complete Performance Index
- $TCPI_{EAC}$ index is compared to the CPI_{cum} index and should be within +/-.1 of the CPI for the EAC to be considered realistic. An accurate well maintained EAC supports the customer's ability to provide sufficient funding to the project.

QE LOI DISCUSSION

27.A.1. DOES THE CONTRACTOR REQUIRE MONTHLY AND COMPREHENSIVE EACs WITHIN CONTROL ACCOUNTS AT THE LEVEL WHERE RESOURCES ARE PLANNED?

In projects, during the monthly review cycle, CAMs review the accuracy and currency of the CA EAC at the same EOC levels and, if necessary, generate a revised CA EAC for PM approval.
The comprehensive EAC is required annually and prepared, at a minimum, at the WP/planning package/SLPP level. Resources are planned within WPs at the element of cost (EOC) level, therefore resources are updated annually within the WP to prepare the comprehensive EAC. The comprehensive EAC also must be accompanied by a basis of estimate (BOE).

IMPACT OF NONCOMPLIANCE
Failure to base EACs on resource requirements creates uncertainty in resources needed to complete the work scope and increases the risk of accomplishing the work.

27.A.2. DO THE CONTRACTOR'S EXTERNALLY REPORTED EACS AND THE INTERNALLY GENERATED EACS FROM A SUMMARIZATION OF THE CA EACS RECONCILE?

The PM is responsible for reporting the most likely EAC each month as well as the best and worst case EACs. Also EACs are reported by WBS in Format 1 and by OBS in Format 2 of the IPMR/CPR. The EACs by WBS and OBS should tie with internal reports. There also needs to be reconciliation between the summarization of EAC from the WBS/OBS and the PM's most likely addressed in Format 5 of the IPMR/CPR. This reconciles the internal and externally reported EACs.

IMPACT OF NONCOMPLIANCE
Without reconciliation, the contractor is not using the same information to manage the project as is used to report to DOE.

27.A.3. ARE ETCS BASED ON TIME-PHASED RESOURCE PLANS THAT ARE CONSISTENT WITH SCHEDULE FORECAST DATES?

The review of ETCs must always include a review of the latest schedule forecast dates, as the schedule forecast will drive costs and must be continually evaluated. Because resource allocation and availability drive the schedule forecast dates, resources included in the ETC must be planned consistently with the schedule forecast and timing. Said a different way, the ETC and the forecast schedule must demonstrate cost and schedule traceability. This traceability also means that the resource spread in the schedule should be the same as the resource spread for discrete work in the EVM Cost Tool [assuming LOE is not in the IMS]. The EAC forms the basis for future resource requirements such as specific labor by category, equipment, facilities, etc. There may be conflicting requirements at the facility or company level for these resources. Shortages and overages must be coordinated with functional management to ensure the EAC is achievable. The EACs must be the result of a fully staffed effort including top management participation to ensure that needed resources (budget, staffing, special skills, etc.) are available for the remaining effort.

IMPACT OF NONCOMPLIANCE
Without time phasing the ETC, future activities will not be aligned with project deliverables.

27.A.4. IS AN EVALUATION OF ALL SUBCONTRACTED EFFORT INCLUDED IN THE EAC?

It is the responsibility of the prime to ensure all project work scope is reviewed in the development of the EAC. Depending on the contractual relationship, either the subcontractor or the prime may be responsible for developing the EAC. If the subcontractor develops the EAC, the prime is still responsible to review the subcontractor's submission to ensure they have followed the ground rules and assumptions and assess the reasonableness of the total EAC. The prime CAM is also responsible to plan the subcontractor fee, if any, in separate work package, to ensure that the EAC incorporates the subcontractor fee.

IMPACT OF NONCOMPLIANCE
Without inclusion of subcontracted work, an EAC is incomplete to determine future funding needs or resources required to complete the work scope.

27.B. SUBSECTION - CAM MONTHLY EAC REVIEW

On a monthly basis, the CAM must review the status of the expended effort and viability of the forecast. This analysis must focus on performance to date within the CA, an assessment of the effort on work scope not yet completed, and an evaluation of the type and quantity of resources required to complete the remaining effort by element of cost. The CAM evaluation of EAC metrics by TCPI, Independent EAC (IEAC) formulas, and correction of any data anomalies at the CA and WP level, can be used for comparative analysis and to check for the reasonableness of the EAC.

This will help ensure a more accurate projection of project costs. When updates are made to existing forecasts, these significant changes are briefed to project management.

QE LOI DISCUSSION

27.B.1. ARE CONTROL ACCOUNT EACS MAINTAINED AND UPDATED PROMPTLY BASED ON EOC LEVEL PERFORMANCE IMPACTS TO THE PROJECT, SCOPE CHANGES, SCHEDULE TECHNICAL PERFORMANCE AND SCHEDULE/COST IMPACTS?

CAMs have the responsibility to review for currency their control account EACs every month during the variance analysis process. Thresholds do not have to be exceeded to change an EAC, just knowledge that the current ETC is no longer realistic and does not represent the work remaining. An update to the EAC may be because of schedule delays, cost variances, degrading performance indices, technical performance issues, realized risks, scope changes, etc.

The ETC is prepared by resource based on variances that occur by EOC. Monthly EAC analysis should focus on performance to date within the control account, an assessment of the effort to complete the remaining work, and an evaluation of the type and quantity of resources required to complete the effort. It is probable that the EAC may require updating based on technical trends that may precede significant schedule and/or cost impacts. Generally, a 5% overrun or underrun to the EAC is considered significant enough to trigger a review of the EAC to determine if the EAC should be updated. A 10% overrun or underrun to the EAC requires an EAC review and update (if applicable).

CAMs need to approve any ETC/EAC update. Effectively maintaining the control account EACs provides project management with the assurance that projected costs for completing the work are credible and that any decisions regarding the allocation of future resources is based on valid data.

$TCPI_{EAC}$ to CPI is the most common metric used to check for the reasonableness of the CAM EACs. The formula for $TCPI_{EAC}$ is $(BAC - BCWP_{cum})/(EAC - ACWP_{cum})$. The other way to look at this formula is left to earn divided by left to spend. When the control account percent complete is greater than 15%, then a .05 and .1 difference is mathematically significant. This difference has been proven out with 1,500 large projects at DOD. The EAC at the CA level should be reviewed for currency at a .05 difference between $TCPI_{EAC}$ and CPI_{cum}. At a .1 difference the EAC must be evaluated and updated if it cannot be justified. In calculation of this metric a .1 or higher number indicates the EAC is understated. A value equal or less than (.1) indicates the EAC is overstated.

Reviewing an EAC for achievability or reasonableness is a good practice at the project level. There are two checks of EAC realism that should be performed: comparison of the CPI_{cum} to the $TCPI_{EAC}$ and then comparison of the EAC to two independent EACs (IEAC).

- Comparison of CPI_{cum} to $TCPI_{EAC}$: The To Complete Performance Index (TCPI) measures how efficient one must be to achieve the EAC being forecast. The formula is: $(BAC - BCWP_{cum}) / (EAC-ACWP_{cum})$. The TCPI must be within 10% of the CPI to be considered achievable or justified.

- Comparison of EAC to the best case/worst case IEACs to provide a range:
  - Cum CPI Method — The Cost Performance Index (CPI) measures the historical efficiency for performing the work. The formula is: $BCWP_{cum}/ACWP_{cum} = CPI$. The IEAC based on this past performance is calculated as $IEAC = BAC/CPI_{cum}$. This provides an EAC solely based on historical cost performance.
  - CPI_{cum} X SPI_{cum} Method — This formula includes cost and schedule performance. The formula is: $ACWP_{cum} + ((BAC - BCWP) / (CPI_{cum} * SPI_{cum})) = IEAC$.
  - The two EACs should be within 10% of each other. Should there be larger differences, the contractor PM should review the EAC for CAs that may have driven the EAC higher than necessary.

These comparisons are valuable in determining the credibility of an EAC. Note that some of the tests overlap; for example, all may indicate an understated EAC. For the purpose of testing, they all are considered one integrated test. Depending on the phase of the project certain EACs may not be relevant. For example, the cumulative CPI method is typically only reliable in the first phases of the project to 50% complete. The CPI/SPI method is only reliable between 35% and 75% complete. The $TCPI_{EAC}$ formula is accurate for most of the project phases. Typically, none of the calculations are reliable below 15% complete.

IMPACT OF NONCOMPLIANCE

Failure to update the EAC based on trends understates potential impacts.

27.C. SUBSECTION - COMPREHENSIVE EACS

The Comprehensive EAC (or bottom up EAC) is conducted at least annually, or as stipulated in the Contractor's EVM SD. This process will need to be repeated more frequently if project performance deems the current EAC is no longer valid.

While the monthly EAC is a routine assessment, the Comprehensive EAC process addresses all facets of the project. This process must include, but not be limited to, ground rules and assumptions, an overall schedule for completing the Comprehensive EAC, identification of templates used to update the EAC, and the final approval process. The customer also needs notification if a funding constraint is breached per guidance in the contract or DOE O 413.3B.

QE LOI DISCUSSION

27.C.1. DOES THE ANNUAL COMPREHENSIVE EACS CONSIDER RISK, FUNDING, AND ALL PROJECT COSTS BY EOC AND IS IT CONDUCTED IN ACCORDANCE WITH THE DOCUMENTED EVM PROCESS?

The Earned Value Guidelines define the EAC as the sum of the contract cumulative- to-date Actual Cost of Work Performed (ACWP) plus the company contractor PM′s best estimate of the time-phased resources (funds) required to complete the remaining authorized work, the Estimate to Complete (ETC). This relationship is often expressed by the formula EAC = ACWP + ETC. Thus, the EAC is a forecast of the project's final cost. The contractor PM may revise work priorities, replan remaining tasks on the project schedule, and/or adjust the technical approach to complete the project's goals within the estimated remaining resources. The goal is to complete all of the contract work scope within the Contract Target Cost (budget) and Contract Completion Date (schedule).

As with all estimates, the level of uncertainty of an EAC will vary with the type of remaining work, the available information, and the perceived remaining risks.
Prudent management needs to know how valid an EAC is, especially when the EAC varies significantly from the project's authorized budget (BAC). Thus, the objectives of project management include the identification of the level of uncertainty associated with the remaining schedule, establishing the cost estimate for the remaining work, and managing the impact of the uncertainty upon the project cost goals.

For these reasons, the Contract Performance Report (CPR) and the Integrated Project Management Report (IPMR) require three separate EACs in an attempt to capture information regarding the level of cost uncertainty or the magnitude of the known project risks. These reports require EACs that represent the Best Case, the Worst Case and the Most Likely EAC. The Best Case estimate is the one that results in the lowest cost to the Government. This estimate is based on the outcome of the most favorable set of circumstances that consider opportunities and factored best case assumptions of risk. The Worst Cast estimate is the one that results in the highest cost to the Government. This estimate is based on the outcome of the least favorable set of circumstances. The Most Likely EAC is the contractor's official EAC and represents the contractor's commitment to DOE. As such, the Most Likely EAC takes precedence over the estimates presented in the IPMR/CPR Column (15) of Formats 1 and 2 and Blocks 6.a.1 and 6.b.1. This EAC is the value that the contractor's management believes is the most likely outcome based on a knowledgeable estimate of all authorized work, known risks, unknown risks, and probable future conditions.

As the actual cost to date is a known value, EAC uncertainty is a function of the Estimate to Complete. The ETC is prepared by re-estimating the resources required to complete the remaining authorized work using the cost experience to date and then applying a number of other factors; such as current direct and overhead rates, Schedule Risk Assessment (SRA), Monte Carlo simulations, root cause analysis, etc. A well-conceived ETC also considers purchase order commitments, anticipated labor efficiency and rate, material price and usage, Other Direct Cost (ODC) price and usage performance, risk and opportunities, resources by type, and other factors identified by higher management. Additionally, as the ETC is being developed it should be mapped to the current schedule consistent with the Estimated Completion Date (ECD).

As a means to cross check the EAC, a mathematical or independent estimate of the EAC is typically prepared using performance indices based upon the cost and schedule experience to date. For example, the Cost Performance Index (CPI) (cumulative Budgeted Cost for Work Performed / ACWP) can be used to complete the EAC by dividing the project BAC by the CPI. The resulting EAC is often referred to as the Independent EAC (IEAC) to distinguish it from a formal or grass roots EAC. The IEAC can be quickly prepared and then used to test the reasonableness of the current cost estimate and to indicate when a comprehensive EAC should be undertaken. It is important to note that these calculations do not consider any "thinking" about the considerations mentioned above with respect to anticipated labor efficiency and rate, risk and opportunities, SRA, etc. It is often said that they are independent of sanity, logic, and judgment but are calculated for comparative analysis, an important purpose.

At least annually, a complete "bottom-up" EAC, called the Comprehensive EAC, is required. A comprehensive EAC is also often prepared at the start of a major project phase, such as the start of

production or construction. Consequently, it can reflect the reduced uncertainty resulting from a design release and/or a released bill of material, which enables the contractor PM to answer these questions:

- Are the remaining authorized funds sufficient to complete the project?
- Is prior cost experience a predictor of future cost performance?
- Should the remaining project be modified based upon the performance to date?
- Will the project cost performance impact the corporate financial condition?

Thus, a timely and realistic EAC and ECD should be an integral part of both project management and corporate financial management practices. Both should require routine comparison of the EAC and ECD with the contract targets to forecast realistic financial performance for customers and stockholders.

This process must include, but not be limited to, ground rules and assumptions, an overall schedule for completing the Comprehensive EAC, identification of templates used to update the EAC, and the final approval process. The customer also needs notification if a funding constraint is breached per guidance in the contract or DOE O 413.3B.

IMPACT OF NONCOMPLIANCE

The EAC provides project management assurance that all factors impacting the total cost to complete project objectives have been considered. Failure to include direct and indirect performance, results in an incomplete EAC which will not provide accurate information.

6.0 REVISIONS AND DATA MAINTENANCE

The Revisions and Data Maintenance category focuses on maintaining an accurate and reliable Contract Budget Base (CBB) and Performance Measurement Baseline (PMB) throughout its POP. The objective of the five guidelines (28–32) that comprise this category is to establish the requirements for implementing a formal change control process that will preserve the integrity of the PMB and corresponding Earned Value Management System (EVMS) data. These guidelines ensure that the PMB reflects the most current plan for accomplishing the effort thus providing credible performance measurement data that management can rely on to make project-related decisions.

As the PMB represents the agreed-upon plan between the contractor and government for how contractually authorized work is accomplished and measured, any changes to the plan must be formally controlled and properly documented using a systematic approach. Ensuring authorized contractual changes are incorporated into all affected budgets, schedules, work authorizations, and other project documentation in a timely manner prior to the commencement of that work ensures the PMB reflects all authorized work scope (Guideline 28). Implementation of the Revisions and Data Maintenance guidelines requires the contractor to use a disciplined change control process that maintains the integrity of cost and schedule data when incorporating authorized revisions to the project's scope, schedule, and/or budgets (Guideline 29). To maintain the accuracy/validity of performance measurement data, and its use for making reliable cost/schedule projections, retroactive changes to the data must be controlled and limited to certain circumstances only (Guideline 30).

The source of revisions to the PMB can be either internally or externally driven and may affect all categories of an EVMS. Consistent and systematic use of a baseline change control process prevents unauthorized revisions to the CBB and PMB (Guideline 31). It is important that authorized baseline revisions are documented, managed, tracked and reported to the contractor PM and the government in a timely manner (Guideline 32). Examples of changes to the baseline are depicted in Figure 16.

The following section describes the DOE interpretation of the Revisions and Data Maintenance section.

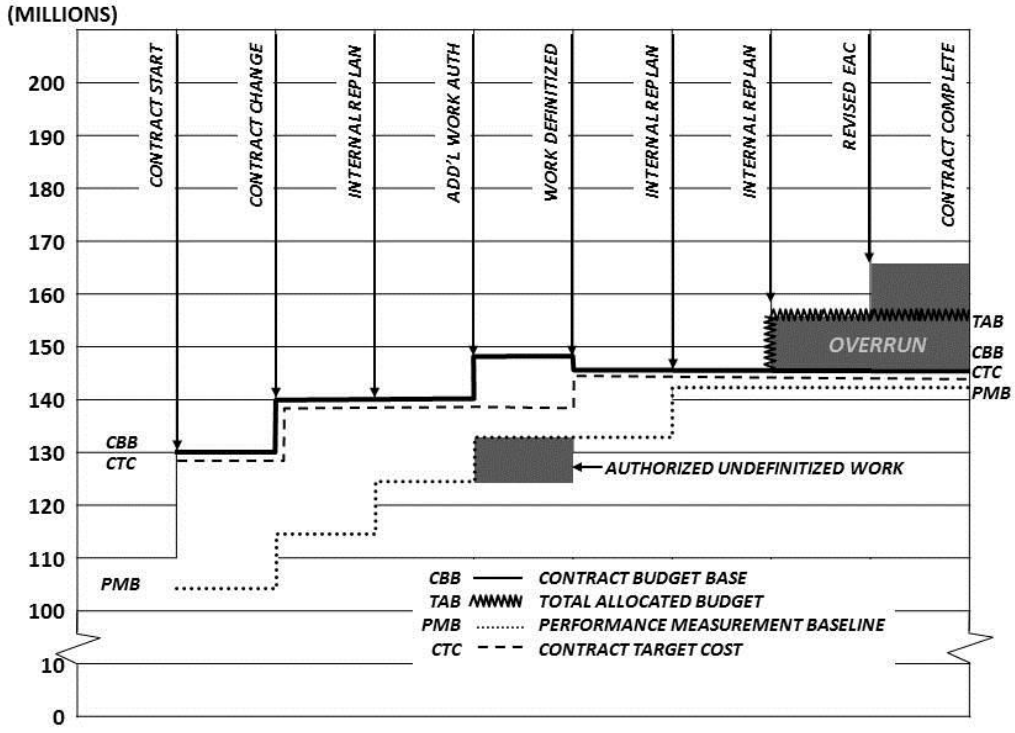


Figure 16 - Example Revisions and Data Maintenance Process

GUIDELINE 28 – INCORPORATE CHANGES IN A TIMELY MANNER

INCORPORATE AUTHORIZED CHANGES IN A TIMELY MANNER, RECORDING THE EFFECTS OF SUCH CHANGES IN BUDGETS AND SCHEDULES. IN THE DIRECTED EFFORT PRIOR TO NEGOTIATION OF A CHANGE, BASE SUCH REVISIONS ON THE AMOUNT ESTIMATED AND BUDGETED TO THE PROJECT ORGANIZATIONS.

PURPOSE OF THE GUIDELINE

To ensure authorized changes are accurately incorporated into the Contract Budget Base (CBB) and project schedule in a timely and systematic manner. Implementing a disciplined change control process assures that the CBB (Performance Measurement Baseline (PMB) + Management Reserve (MR)) is up to date and that performance measurement data reflects all authorized work scope.

MANAGEMENT VALUE OF THE GUIDELINE

A properly maintained CBB is crucial to effective project management. The timely and accurate incorporation of contractual changes ensures that the information generated from the execution of the baseline plan provides an accurate picture of progress and facilitates appropriate management actions and decisions.

This guideline addresses changes to the baseline in one of two ways: 1.) Incorporate Negotiated Changes: The requirements for handling the incorporation of DOE directed changes, or 2.) Authorized Unpriced Work (AUW): A unique aspect of implementation is reacting to non-formal changes. This section sets the minimum expectation for handling AUW.

IMPACT OF NONCOMPLIANCE

Would not ensure that the CBB (Performance Measurement Baseline (PMB) + Management Reserve (MR)) is up to date and that performance measurement data reflects all authorized work scope.

28.A. SUBSECTION - INCORPORATE NEGOTIATED CHANGES

Management must ensure that DOE directed changes are incorporated into the project plan. Change is inevitable and as projects progress, new concepts or opportunities surface, and risks are realized impacting the original plan that may now need revision.

Incorporating negotiated changes is conducted in a very controlled manner. This controlled process preserves the integrity of the original plan, allowing a clear understanding of what is changing. Authorized changes are processed in a timely manner, within two accounting periods after the DOE approved change document and one accounting period after the approval of the contractor baseline change documentation (e.g. Budget Change Request (BCR)). Project documentation is revised consistent with the authorized contractual change ensuring the new project direction is supported by revised budgets, schedules and forecasts. Maintaining up-to-date project documentation is also important to ensure the most recent negotiated changes are incorporated into the EVM system.

QE LOI DISCUSSION

28.A.1. ARE AUTHORIZED CHANGES INCORPORATED IN THE CBB, PMB AND THE IMS NO LATER THAN ONE FULL ACCOUNTING PERIOD FOLLOWING THE CONTRACTOR BASELINE CHANGE DOCUMENTATION APPROVAL?

The baseline must reflect the current authorized work scope with contractual changes. A properly maintained and up-to-date PMB and IMS are crucial to effective project management. The timely and accurate incorporation of contractual changes ensures that the information generated from the execution of the baseline plan provides an accurate picture of progress and facilitates appropriate management actions and decisions. New scope and/or contingency must be authorized by the customer.

IMPACT OF NONCOMPLIANCE

Without timely incorporation of authorized changes, the baseline does not reflect the current authorized work scope from contractual changes, which prevents the proper execution of authorized work.

28.A.2. IS UB DISTRIBUTED TO OR REMOVED FROM CONTROL ACCOUNTS OR SUMMARY LEVEL PLANNING PACKAGES AS SOON AS PRACTICABLE, BUT NOT LATER THAN TWO ACCOUNTING PERIODS AFTER THE DOE APPROVED CHANGE DOCUMENT?

UB is budget that is applicable to specific contractual effort that has not yet been distributed to CAs or Summary Level PPs (SLPPs). Identification of the project's UB, facilitates project management's ability to account for and report on all authorized scope and budget. UB is a holding account for new authorized work or AUW. Once a DOE approved change document has been approved, the UB budget and scope must be distributed to CAs and/or SLPPs no later than two full accounting periods. For unpriced change orders (Authorized Unpriced Work (AUW)), the contractor's best estimate of the cost of the new work scope is developed for planning and budgeting purposes. This value is used to establish initial budgets in the PMB. Until the effort is definitized and priced, scope and budget for near term efforts are established in CAs with the remaining scope and budget held in UB until negotiations are complete. After definition, the scope and budget remaining in UB will be planned and budgeted in CAs and/or SLPPs as soon as practical, typically within 60 working days, but no later than two full accounting periods after the baseline change documentation is approved (also see Guidelines 9 and 14).

UB may also contain scope removed from the distributed baseline. If the government issues a stop work order or DOE required scope reductions, the work must be immediately stopped with the budget associated with the budgeted cost of remaining work returned to UB to await final definitization and removal from the contract/project. This distribution is required within one full accounting period after the stop work order is received to keep project scope and time phased PMB in synch. Contract scope reductions are removed from UB within one month after the baseline change documentation approval taking the scope out of the project for the work stopped.

IMPACT OF NONCOMPLIANCE

Failure to distribute scope and budget in a timely manner after a stop work order may result in delays in detailed planning and work execution. Failure to reclaim budget (in the event of a stop work) in a timely manner may result in work being performed after a stop work order has been issued.

28.A.3. DOES THE CONTRACTOR INCORPORATE AUTHORIZED CHANGES INTO THE WBS DICTIONARY, IMS, EVMS COST TOOL, CBB LOG, AND WORK AUTHORIZATION WITHIN THE SAME ACCOUNTING PERIOD?

The intent of this QE LOI is to ensure all baseline documents (work scope, schedule, and budget) are in agreement with the change authorized on the internal baseline change document, are compliant with the contract change and are all updated during the same accounting period. This QE LOI does not address timing, but do require that when changes are made all of the documentation must be updated in the same month.

Authorized changes are incorporated into baseline documents, such as schedules, budgets, work authorization documents, and other project documentation as needed to properly reflect the new work scope. This provides performance measurement data that accurately reflects the status of all currently authorized work and ensures an integrated baseline. Authorized changes must be incorporated in all appropriate baseline documents within the same period to keep project scope and time phased PMB integrated.

IMPACT OF NONCOMPLIANCE

Failure to incorporate authorized changes in the appropriate baseline documents will result in a baseline that is no longer integrated, which result in unauthorized work being performed, or authorized work not being performed.

28.B. SUBSECTION - AUTHORIZED UNPRICED WORK

Authorized unpriced work (AUW) accommodates the need for additional scope and budget and provides a controlled process to allow work to begin and negotiations to follow. There are times when the contractor and DOE agree additional scope that was not in the original work statement but is understood to be required is necessary to accomplish the project objectives. It may be that the work must be started immediately, preceding negotiations to definitize the final budget. While UB distributions to accommodate AUW in the near term may be limited by the "Not to Exceed" (NTE) funding authorizations, the full estimate for AUW should be placed in UB at the time the AUW is authorized until distributed.

QE LOI DISCUSSION

28.B.1. IS AUW INCORPORATED INTO THE PMB AT THE ESTIMATED VALUE OF THE AUW SCOPE REGARDLESS OF ANY "NOT TO EXCEED" (NTE) SPENDING LIMITATION?

AUW must be incorporated into the PMB at its estimated value for the entire work scope and therefore not be limited to a contractual funding limitation such as a Not to Exceed (NTE). Because these funding limitations are typically at 50% or at some amount less than the anticipated total value of the effort, it is simply a partial amount to encourage negotiations. The entire estimate for the newly authorized work scope is then placed into UB. The contractor is encouraged to distribute

only the amount of budget necessary for near term work until the entire effort can be definitized. Once the definitization has occurred, the AUW can then be more easily adjusted to the negotiated amount, and then the UB amount remaining distributed to CAs and SLPPs (see Guideline 28.B.2).

The contractor determines the full value of the change to incorporate into the baseline from one of several sources. This number is provided to DOE before implementation. As the estimate matures, the revised forecast is reconciled with the remaining UB budget as applicable. In order of preference the sources could be

- A number with full scope provided by DOE. This number does not include an NTE that is not based on the total scope.
- A proposal with Certified Cost and Pricing.
- Any written proposal.
- A Rough Order of Magnitude (ROM) estimate.

The changes to the CBB in the form of Authorized Unpriced Work (AUW) must accurately identify all authorized scope on contract. AUW scope and associated budgets are identified without the constraint of funding or Not to Exceed (NTE) limitations, but are related to the value of the proposal. Just as incrementally funded contracts should establish a CBB for the entire scope of work, the budget established for AUW must represent all authorized scope. The contractor responds to the AUW authorization by placing the near-term budget into the applicable CAs and the remainder in undistributed budget until negotiation and incorporation into the contract (and removal from AUW). After definitization of a contract modification, any AUW budget remaining in UB is allocated appropriately, i.e., either planned and budgeted into control account(s), SLPP(s), or MR as soon as practical or removed from the CBB.

IMPACT OF NONCOMPLIANCE

Failure to incorporate the full, estimated budget for all newly authorized work results in a baseline that does not fully represent the work scope of the changed contract.

GUIDELINE 29 – MAINTAIN BASELINE AND RECONCILE BUDGETS

RECONCILE CURRENT BUDGETS TO PRIOR BUDGETS IN TERMS OF CHANGES TO THE AUTHORIZED WORK AND INTERNAL REPLANNING IN THE DETAIL NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL.

PURPOSE OF THE GUIDELINE

To ensure the ongoing integrity of the Contract Budget Base (CBB), budget traceability throughout the lifecycle of a project must be maintained. Current budgets must reconcile to prior budgets in terms of changes to work scope, resources, schedule, and rates so that the impact of contract changes and internal replanning on overall project growth is visible to all stakeholders.

MANAGEMENT VALUE OF THE GUIDELINE

The need for accurate performance measurement requires that the CBB maintain a traceable relationship to the contract. As changes are made to the contract, the CBB must be adjusted by the amount of change in order for the communication between the customer and contractor to remain valid.

IMPACT OF NONCOMPLIANCE

The impact of contract changes and internal replanning on overall project growth would not be visible to all stakeholders.

29.A. SUBSECTION - FREEZE PERIOD DEFINITION AND RESTRICTIONS

A period of time where changes to the baseline are not permitted (aka freeze period) is a period of time from time now to a point in the future where changes are not permitted (except for a few conditions such as the correction of errors, rate adjustments, customer or management approved actions and safety, emergency, or critical issues). This restricted period encourages detailed control account planning to be in place beyond the freeze period to facilitate efficient execution of the near term work scope and to allow valid performance measurement.

QE LOI DISCUSSION

29.A.1. IS THE FREEZE PERIOD DEFINED IN THE SD AS NO LESS THAN THE CURRENT ACCOUNTING PERIOD PLUS ONE PERIOD, AND IS IT CONSISTENTLY APPLIED?

The freeze period must be defined in the EVM SD and must be at a minimum the current accounting period plus the next accounting period (refer to Figure 17).

The freeze period is a term used to indicate a restrictive period for baseline changes. Several definitions are crucial to understanding this concept. Typically, contractors will follow an accounting calendar rather than the monthly calendar so the freeze period is referenced in terms of the calendar used for EVMS. Contractors will use this accounting calendar for all aspects of EVM planning, execution, and reporting. The intent of the freeze period is that there must be no ability to perform the work and then adjust the budget time phasing based on actual performance in order to mask variances. Baseline changes are highly restricted during this defined freeze period in order to maintain a stable and measurable work plan for ongoing work.

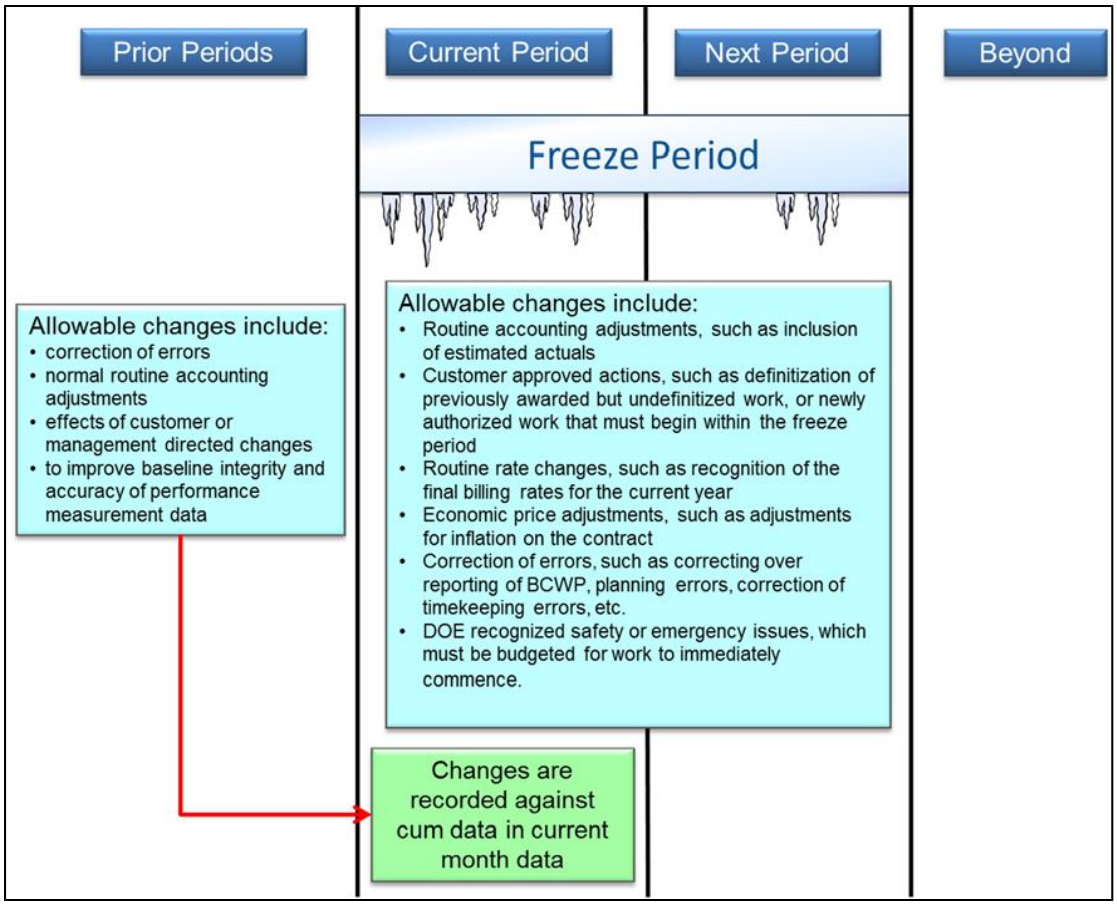


Figure 17 - Freeze Period Changes

The freeze period may be longer but it must be at least two reporting periods, i.e. current plus one. At the beginning of the month it is the longest and the end of the month the shortest. It rotates at the contractor accounting calendar month-end date to the next following month-end date to the next following month-end.

IMPACT OF NONCOMPLIANCE

Frequent, continuing, or unallowable adjustments to the baseline within the freeze period will result in the lack of insight into true performance variances and the potential for actual cost mischarging.

29.A.2. ARE BASELINE CHANGES AND/OR ACCOUNTING ADJUSTMENTS THAT ARE DEFINED AND IMPLEMENTED WITHIN THE FREEZE PERIOD DESCRIBED IN THE EVM SD, WITH ANY EXCEPTIONS DESIGNED TO IMPROVE THE QUALITY OF EVMS DATA?

Managers must restrict any baseline and accounting changes during a defined freeze period. Baseline and accounting changes are highly restricted during the defined freeze period in order to maintain a stable work plan for ongoing work, allow meaningful variances, and to ensure that planned resources will be available as scheduled.

Changes permitted within the freeze period are limited to:

- Routine accounting adjustments, such as inclusion of estimated actuals;
- Customer approved actions, such as definitization of previously awarded but undefinitized work, or newly authorized work that must begin within the freeze period;
- Activities associated with REAs, emerging work, and work arounds not already in the baseline schedule through the BCP process;
- UB (directed changes and correction of errors);
- MR scope based changes;
- Routine rate changes, such as recognition of the final billing rates for the current year;
- Economic price adjustments, such as adjustments for inflation on the project;
- Correction of errors, such as correcting over reporting of BCWP, planning errors, correction of timekeeping errors, etc.; or,
- DOE recognized safety or emergency issues, which must be budgeted for work to immediately commence (management approved actions).

The IPMR/CPR Format 5 must identify the reasons for MR transactions and these must agree with the reasons provided in the suppliers change control documentation. Review freeze period budget change documents to ensure adherence to the process. Verify cost and schedule explanation of impacts to the IMS and CBB are documented. Compare all documentation to ensure internal changes match what is reported to the Government.

IMPACT OF NONCOMPLIANCE

Frequent or continuing adjustments to the baseline or accounting data within the freeze period may result in the lack of insight into true performance variances and the potential for actual cost mischarging.

29.A.3. DOES DOCUMENTATION FOR ANY BASELINE CHANGE INCLUDE ALL RELEVANT ITEMS THAT IMPACT THE BASELINE PLANNING?

Managers must ensure that all baseline change documentation is reconciled throughout the EVMS. The source documents may vary between contractors depending on their EVM systems, but will include:

- Baseline schedule durations (baseline start and finish dates);
- Baseline schedule links, showing any updated or new logic;
- Earned value techniques for new WPs;
- Proposed new earned value technique process for changing WPs before and after EVT is revised;
- Baseline budgets by element of cost;
- Baseline rates used for planning (may refer to date and name of approved set)'
- Justification for proposed baseline changes within freeze period.

Note that the contractor's system may also require submission of any proposed QBD as back up for the earned value technique. When a change is required from one budgeted element of cost to another, the change is driven by either a change in the work scope or how the work will be performed. For example, work was previously budgeted as labor meaning it would be performed by in house (prime contractor) labor resources. If a subcontractor was now performing the work, the budget element must change from labor to subcontract/material. In all cases, this item represents a change in the

work scope and how it will be done, and must be approved and documented in a baseline change request.

Additionally, the earned value technique (EVT) may not be changed in an open WP where direct costs have already been incurred unless the EVT chosen was proven to be a planning error. The preferred method is to close the existing open WP by setting cumulative BCWS and BAC equal to cumulative BCWP and planning a new WP with the different technique. Again, ACWP is not changed when the existing WP is closed, and any CV will remain with the closed WP.

If the preferred method for revising the EVT by closing the existing WP and opening a new one is not used and the contractor chooses to revise the existing WP, then the contractor must:

- Adjust the cumulative BCWP for performance using the new EVT. The issue here is that the percent complete could change using a different EVT. This issue includes QBDs, if applicable.
- Update the IMS and the EV Cost Tool.
- Provide the justification and documentation for changing the EVTs in open WPs in the IPMR/CPR Format 5.

IMPACT OF NONCOMPLIANCE

Failure to properly document the supporting details for proposed baseline changes invalidates the integrity of the PMB.

29.B. SUBSECTION - CHANGE RECONCILIATION CONTENT

The integration of scope, schedule and budget during the change process is crucial to baseline integrity. Following a controlled and consistent change process is vital to maintaining accurate EVM reporting. The change process requires that there be a clear understanding of what is being changed and reconciliation between the current plan and the revised plan facilities this understanding. Project documentation such as work authorizations, schedules, and project logs provides and demonstrates this reconciliation.

QE LOI DISCUSSION

29.B.1. ARE THE REVISED SCHEDULES AND BUDGETS RESULTING FROM AUTHORIZED BASELINE CHANGES TRACEABLE TO THE PRIOR SCHEDULES AND BUDGETS?

Current budgets and schedules must reflect the current levels of authorized work and be based on resources needed to complete that work. The budgets must be traceable to original authorized budgets and scope.

It may be necessary to perform internal replanning actions within scope of the authorized contract (CBB or Total Allocated Budget (TAB)) to compensate for cost, schedule, and technical problems which have caused the original plan to become unrealistic; or which require a reorganization of work or people to increase efficiency of operations; or which require different engineering or manufacturing approaches. Internal replanning is intended to maintain an executable baseline for the remaining in-scope work on the contract.

Schedules must support the project milestones and deliverables. The ability to track budget values and schedules for both internal and external changes is necessary to properly maintain the CBB from contract start to completion. This process also ensures that the CBB maintains a traceable relationship to the contract. As changes are made to the contract, the CBB must be adjusted by the amount of change in order for the communication between the DOE and contractor to remain valid.

IMPACT OF NONCOMPLIANCE

Inability to trace the changes leading to the current budget baseline results in a lack of confidence that the baseline changes were properly authorized and implemented, leading to a lack of confidence in the validity of the baseline.

29.B.2. ARE INTERNAL CHANGES FULLY AUTHORIZED CONSISTENT WITH THE CONTRACTORS CHANGE CONTROL/SD PROCESS?

Internal replanning should not be used as an alternative to proper initial planning, nor should it be used to mask legitimate variances. Internal changes are those changes to the baseline where the CBB is not affected. Examples of these type of changes include, but are not limited to, replanning and/or rephasing of existing WP budgets, rolling wave or block plan conversion, application of MR for work that is new to the control account, etc. The contractor must establish an internal process for the preparation, review, and approval of baseline changes. Typically, these changes are prepared on a baseline change request (BCR) and requested by the CAM and go through an approval cycle prior for incorporation into the baseline. This process must be followed consistently in order to ensure only fully authorized changes are made to the baseline.

IMPACT OF NONCOMPLIANCE

Failure to follow the established process results in unauthorized baseline changes and also the potential for out of scope work or unauthorized expenditures and/or unallowable costs.

29.B.3. IF THE PROPOSED CHANGE INVOLVES UB, DOES THE CHANGE RECONCILE WITH THE TRANSFER TO OR FROM CAs, SLPPs, OR MR?

Management must ensure that if a change involves UB, it is reconciled with the CAs, SLPPs, or MR. As UB is a temporary holding account for work scope and budget, any baseline change that involves a transaction from UB to CAs and/or SLPPs or vice versa must be offset by a reverse change to the affected accounts. For example, if a change was recorded to UB to move $1M to the distributed budget, UB would be decremented by $1M, and the distributed budget would be incremented by $1M. The sum of the budget changes to the CAs/PPs or MR must always be equal to the amount distributed from UB. These offsetting entries would be recorded in the CBB log against the appropriate budget elements (see Subsection 29.D).

Most changes will involve movement from UB, but there may be occasions when budget (and the corresponding work scope) is moved from the CAs/WPs into UB. This process is typically done during major re-baselining, movement across CAs, between CAMs, or during stop work situations. UB should be available by change authorization. So when work is distributed in part the remaining budget in UB is still tied to the scope not yet distributed to "CAs". UB may never be negative.

IMPACT OF NONCOMPLIANCE

Failure to record offsetting and equal entries against UB and the distributed budget will result in erroneous values for the budgets and an inaccurate baseline.

29.B.4. DOES THE CONTRACTOR LIMIT THE USE OF MANAGEMENT RESERVE (MR) TO USE WITHIN PROJECT SCOPE AND OUT OF SCOPE CONTROL ACCOUNT CHANGES; INDIRECT RATE CHANGES, CHANGES TO PLANNING ASSUMPTIONS; MAKE/BUY DECISIONS, OR SUBCONTRACTOR ORIGINAL NEGOTIATIONS?

While the contractor system may specify restrictions on the use of MR, there are general principles that must be observed. MR is used for new work that is within scope of the project, but is out of scope to the control account. These situations typically arise when risk has been realized, resulting in new work that must be performed in order to meet the terms of the project. This new work may be the result of a change in a make/buy decision and/or the project execution strategy. Other circumstances include risk and opportunity handling, workaround involving new technology, and rephasing unopened work packages and planning packages for work that has not yet begun. A test for whether MR may be allocated to the control account is determined if the work description for the account needs to be revised and the work is within scope of the project. MR may also be allocated for significant indirect rate changes, changes to planning assumptions, make/buy changes, or subcontractor original negotiations and technically based risks identified in the contractor risk register. Current indirect rates are used for changes to future work and are reconcilable to the prior indirect rates incorporated in the Performance Measurement Baseline (PMB). MR is never used to offset or zero out variances, for either cumulative-to-date or projected variances. Additionally, MR is not used for work that is out of scope to the project. MR is never negative.

IMPACT OF NONCOMPLIANCE

Violating the prohibition against applying MR to existing work within the CAs will result in elimination or distortion of performance variances, severely curtailing management's ability to identify and correct performance issues and/or estimate project completion cost and/or date.

29.C. SUBSECTION - CHANGES TO OPEN WPs

Changes may impact work scope currently being executed. While changes to open WPs are permitted under specific conditions, it is important to follow a controlled process to ensure the previously reported EVM data is not compromised. In order to further control near term changes, freeze period restrictions may limit changes to open WPs.

QE LOI DISCUSSION

29.C.1. ARE CHANGES TO BCWS IN OPEN WPs BEYOND THE FREEZE PERIOD LIMITED TO TIME PHASING THE EXISTING BUDGET?

The only permissible change to open WPs is a change in the time phasing of the existing budget by EOC beyond the freeze period without DOE approval/direction. This is to ensure baseline stability and a continuing valid measurement of reported BCWP. When new scope-related changes drive a change to an open WP, the preferred method is the WP must be closed by setting cumulative BCWS equal to cumulative BCWP. A new WP would then be planned with the revised scope and budget. ACWP is not changed when the existing WP is closed, and any CV will remain with the closed WP.

If the preferred method for implementing new scope is not used and the contractor chooses to revise the existing WP, then the contractor must:

- Add the additional budget using current planning rates.
- Update the IMS and link/relink activities as required and realistic.
- Adjust cumulative BCWP for performance within the earned value technique. The issue is that the BAC has changed, so the prior cumulative percent complete will change the current BCWP. This includes QBDs, if applicable.
- Provide justification and documentation for changing open WPs in the IPMR/CPR Format 5.

IMPACT OF NONCOMPLIANCE

Failure to have effective baseline controls in place for open WPs will result in an unstable baseline, unauthorized changes, and lack of insight into the true performance of the project.

29.C.2. ARE OPEN LOE WORK PACKAGES WITH INSIGNIFICANT CUMULATIVE ACWP REVIEWED FOR PURPOSES OF REPLANNING TO REDUCE FALSE VARIANCES?

LOE WPs may be replanned to align the budget with the expected start and completion dates for work to be executed. LOE WPs may even be replanned within the freeze period when few cumulative actuals have occurred, to ensure that BCWP will be recorded at the proper time to align with the time frame when actual costs are expected to occur. The interpretation of few is less than 10% actuals to date as compared with the cumulative budget. However, if significant actual costs have already been recorded, these baseline changes are prohibited except for the controlled purposes as defined in QE LOI 29.B.4.

IMPACT OF NONCOMPLIANCE

When LOE WPs are not replanned to align with expected actual costs, BCWP will be still be automatically recorded, resulting in a false cost variance.

29.D. SUBSECTION - LOGS

Project logs provide a method of tracking changes to budgets on the project. The logs typically keep a running balance of the current budget reflecting each change impacting the specific account, such as MR or undistributed budget. Each entry made in an account reconciles to other project documentation such as the MR or UB logs, work authorizations, change control documentation,

schedules, and control account planning, PMB, and CBB. The logs provide a significant portion of the data required in the monthly EVMS reporting for the IPMR/CPR and PARSII submissions.

QE LOI DISCUSSION

29.D.1. ARE ALL CHANGES DOCUMENTED IN THE CBB LOG THAT INCLUDES CA, SLPP, PP, MR, UB INFORMATION AND RECONCILED ALL CHANGES MONTH TO MONTH?

Every transaction for MR or UB must be thoroughly documented with the appropriate supporting details in change control documentation. The documentation must specify the affected control account(s) and contain a good justification for the proposed change. Requests for MR must justify the budget request for the control account. Every transaction must follow the guidance and restrictions established in the contractor's system description.

Typically, an entry is made in the project's applicable budget log (CBB, MR, UB, etc.) when the CAM requests a number to begin preparation of the change. After approval, the approval date is noted in the log, and the appropriate adjustments are made to MR or UB, and to the distributed budget. These adjustments must track directly to the approved change on the change documentation, with a single entry in the log. After approval, the changes are incorporated into the baseline IMS and budget as appropriate and the work authorization document is created or updated to reflect the new baseline. The revised baseline is also reflected in the EVM Cost Tool output for CAPs and also incorporated in the month-end IPMR/CPR.

IMPACT OF NONCOMPLIANCE

Inappropriate or improperly tracked baseline changes result in an unstable and corrupt baseline, causing bad information for decision making by the contractor PM. Baseline changes that are poorly justified may lead to poor work execution and scope creep.

GUIDELINE 30 – CONTROL RETROACTIVE CHANGES

CONTROL RETROACTIVE CHANGES TO RECORDS PERTAINING TO WORK PERFORMED THAT WOULD CHANGE PREVIOUSLY REPORTED AMOUNTS FOR ACTUAL COSTS, EARNED VALUE, OR BUDGETS. ADJUSTMENTS SHOULD BE MADE ONLY FOR CORRECTION OF ERRORS, ROUTINE ACCOUNTING ADJUSTMENTS, EFFECTS OF CUSTOMER OR MANAGEMENT DIRECTED CHANGES, OR TO IMPROVE THE BASELINE INTEGRITY AND ACCURACY OF PERFORMANCE MEASUREMENT DATA.

PURPOSE OF THE GUIDELINE

Control retroactive changes to records pertaining to work performed that would change previously reported amounts for actual costs, earned value, or budgets. Adjustments must be made only for correction of errors, routine accounting adjustments, effects of customer or management directed changes, or to improve the baseline integrity and accuracy of performance measurement data.

MANAGEMENT VALUE OF THE GUIDELINE

This Guideline is intended for the active performance period and it provides general guidelines for the types of changes, (i.e., correction of errors, routine accounting adjustments, effects of customer or management directed changes, or to improve the baseline integrity and accuracy of performance measurement data."

One of the most important EVMS tests is used to find out if there have been unauthorized retroactive changes to the baseline. In practice, this test is done by examining whether a contractor has a change control process that controls retroactive changes to previously reported amounts for actual costs (ACWP), earned value (BCWP), or budgets (BCWS) through a process that includes management approval. Authorized changes to previously report amounts must be made in the current reporting period. Another important test compares the contractor's current period data on the IPMR/CPR formats 1 and 3 (which reflect any retroactive changes) to the related explanations on format 5. This examination helps to ensure that a realistic Performance Measurement Baseline is maintained and there is continuous and consistently credible visibility into past performance. Some contractors might be tempted to eliminate the favorable cost variances from past performance in order to allocate the remaining (unused) budget to future effort. This tendency is usually based on the contractor not making the distinction between financial funding and EVM budgeting standards. The intention of an EVM budget baseline is to maintain visibility of past performance for the purpose of forecasting future performance. It is important to remember that the BCWP is allowed to change for the correction of errors and for the examples of acceptable changes listed below to improve the accuracy of earned value. If other changes are made, then the integrity of the BCWP value becomes suspect.

BCWP is the cornerstone of a performance measurement system and it should be based on the accomplishment of discrete tasks that are representative of true progress. The objective is to minimize any subjectivity in the BCWP calculation. One type of allowable routine accounting adjustment to BCWS stems from negotiating an unpriced change order that results in a differential between the distributed budget of the change and its negotiated value. Please note that the BCWP value should not be impacted by this type of adjustment.

Replanning, or the realignment of scope, schedule, and budget within the Contract Budget Base (CBB), must be limited to preserve a stable baseline upon which performance is measured. Replanning is generally intended for future plans (in the next accounting period, or outside the "freeze" period e.g., current period plus x# months) that significantly vary from the original baseline, but it may also affect budgets in past or current periods within strict controls. Cost, schedule, and technical problems often cause the original plan to become unrealistic; they may require a different engineering or manufacturing approach, or reorganization to increase efficiency of operations. Changes to improve baseline integrity or the accuracy of performance measurement are acceptable, even though they may appear primarily to offset cost overruns or underruns.

Examples of acceptable changes to previously reported amounts for actual costs, earned value, or budgets during the active performance period are the following:

- De-earning BCWP when a material item is returned to vendor for repairs;
- De-earning BCWP when rework is required;
- Change in approach due to make or buy decisions;
- Adding budget in the active performance period for risk mitigation activities; and
- Rate adjustments (limited to ACWP only).

Conversely, an example of an unacceptable change is when a contractor retroactively reduces a performance value previously reported to equal the actual costs incurred, and then transfers the resulting budget for the effort to other activities that are overrunning. Even though this transfer may be undertaken at the prompting of the project office, it translates to mean a budget underrun (placed against the next emerging issue) rather than a measure of performance. As a result, these changes often have a material impact on reported values and go uncontrolled as negative BCWS, BCWP and ACWP.

Any mass retroactive change as an across-the-board single point adjustment can have drastic effects on the project and its progress reports. A retroactive change to monthly data will not only cause management to question the work that was previously thought to have been accomplished, but it will also impact the cumulative trend that was previously reflected.

The contractor's adjustment method for the effects of a customer-directed change is critical. Changing a control account budget value during a freeze period for customer directed changes is a legitimate necessity and should be considered as part of a contractor's internal controls process. Furthermore, the contractor's work authorization process needs to accommodate such changes prior to the start of work during the active performance period. Otherwise, the authorization process will lag behind, and it could lead to establishment of zero-budget accounts or work packages that would result in negative performance values.

IMPACT OF NONCOMPLIANCE

Failure to control and restrict retroactive changes to the above conditions may result in a significant number of retroactive changes to previously reported data, thereby invalidating the monthly analysis and management decisions by the contractor's management and by the DOE.

QE LOI DISCUSSION

30.A.1. DOES THE CONTRACTOR LIMIT RETROACTIVE CHANGES TO ROUTINE ACCOUNTING ADJUSTMENTS, DEFINITIZATION OF CONTRACT ACTIONS, CUSTOMER OR MANAGEMENT DIRECTED CHANGES, OR TO IMPROVE THE BASELINE INTEGRITY AND ACCURACY OF PERFORMANCE MEASUREMENT DATA?

Management controls and limits the number of retroactive changes to previously reported data and ensures authorized changes are made in the current reporting period, not in the period in which it occurred, to provide visibility.

Retroactive changes must be limited to the following conditions:

- Routine accounting adjustments, such as clerical errors, cost transfers, calculation errors, prior period omissions, and prior period adjustments to actual overhead rates;
- Customer or management approved actions, such as definitization of previously awarded but undefinitized work;
- Routine rate changes to ACWP only, such as recognition of the final billing rates for the current year;
- Data entry corrections, such as correcting the reporting of BCWP, correction of timekeeping errors, etc.;
- Recording the impact of closing a WP by setting cumulative BCWS to the value for cumulative BCWP; or,
- Economic price adjustments, such as adjustments for inflation on the contract
- Does the contractor prevent future budget from being used to change the budget of current work or to and offset schedule/cost variances?

IMPACT OF NONCOMPLIANCE

Failure to control and restrict retroactive changes to the above conditions may result in a significant number of retroactive changes to previously reported data, thereby invalidating the monthly analysis and management decisions by the contractor's management and by the DOE.

30.A.2. IS THE USE OF SINGLE POINT ADJUSTMENTS RESTRICTED TO THE DEVELOPMENT OF A NEW REALISTIC PMB, PERFORMED WITH CUSTOMER APPROVAL, AND IN ACCORDANCE WITH THE CONTRACTOR'S DOCUMENTED SYSTEM DESCRIPTION?

A Single Point Adjustment (SPA) is the process that sets existing contract cost and/or schedule variances to zero and typically accompanies a replan of remaining effort with the goal of completing the project on schedule and within budget. If a contractor applies the concept of an SPA, then proper controls need to be defined and practiced. Following the implementation of an SPA, the goal should be to develop a new Performance Measurement Baseline (PMB) that completes all the remaining work using the remaining budget from the original PMB.

Variances may be reset according to the following table. It should be noted that all adjustments are recorded in the current reporting period; in other words, historical reporting is unchanged. Also note that the ACWP is never changed and must always reconcile to the actual accounting records.

Approaches	Method
Eliminate Schedule Variances only (most preferred)	Set cum BCWS equal to cum BCWP
Eliminate Cost and Schedule Variances (least preferred)	Set cum BCWS and BCWP = ACWP
Eliminate Cost Variances only (rare)	Set cum BCWP = ACWP

Figure 18 - Single Point Adjustment Approaches

There are three different approaches for adjusting variances (Fig. 18). The preferred approach, when deemed necessary and approved, is the option that only eliminates the schedule variance. The remaining BCWS is then available for replanning into future periods as part of the replanning exercise. This procedure is a logical approach as the budget corresponds to the revised scope of work, provides a valid basis for measuring performance on the revised work, and historical records of actual costs associated with work performed have not been lost.

The least preferred is to eliminate both cost and schedule variances. The BCWS and BCWP are set equal to ACWP. It is discouraged because it does not accurately reflect the work performed at closeout and invalidates the use of productivity measures used in evaluating revised estimates at completion. A rare approach is where only the cost variances are eliminated. This is done when the schedule information is considered valid.

SPAs must be implemented sparingly, as resetting variances to zero restricts any insight into performance for several months. The contractor must provide advance notification and request for approval to the contracting officer prior to implementation of an SPA. If the contractor also adds additional budget during this process that exceeds the target cost, it is known as an over target baseline (OTB). (Refer to Guideline 8).

IMPACT OF NONCOMPLIANCE

Frequent and uncontrolled use of SPA techniques results in performance variances being continually eliminated, with the result that performance data is useless for analysis and predictive forecasting.

GUIDELINE 31 – PREVENT UNAUTHORIZED REVISIONS

PREVENT REVISIONS TO THE PROJECT BUDGET EXCEPT FOR AUTHORIZED CHANGES.

PURPOSE OF THE GUIDELINE

Prevent the incorporation of unauthorized revisions into the Contract Budget Base (CBB).

MANAGEMENT VALUE OF THE GUIDELINE

The consistent and systematic use of a baseline change control process to implement changes prevents unauthorized revisions to the time-phased Performance Measurement Baseline (PMB). Unauthorized revisions could inadvertently result in baseline budgets or schedules that exceed the CBB. The CBB is a controlled value and cannot be changed by the contractor except as a result of customer contract actions.

There may be situations when available budgets for the remaining work are insufficient for successful execution of the current plan, and result in unrealistic or unexecutable assessments of project performance. In these situations, contractor PMs may conclude that the PMB no longer provides meaningful cost and/or schedule performance data. It may be necessary for the Total Allocated Budget (TAB) for the work to exceed the CBB, a condition known as an OTB, and/or for the baseline schedule to exceed contract milestones, a condition known as an Over Target Schedule (OTS). The process of establishing either an OTB and/or OTS is called Formal Reprogramming and may be considered where improved insight and management control would result.

A thorough analysis of project status is necessary before the consideration of the implementation of an OTB and/or OTS. Requests for establishing an OTB or an OTS must be initiated by the contractor and approved by the customer contracting authority. Subcontractor flow-down, where it relates to formal reprogramming, is the prime contractor's responsibility to approve and manage. Implementing an OTB and/or OTS does not change the terms and conditions of the contract but merely serves to improve management of the remaining work. For special considerations to reset variances or implement a Single Point Adjustment (SPA) for an OTB/OTS, refer to Guideline 30.

IMPACT OF NONCOMPLIANCE

Unauthorized revisions could inadvertently result in baseline budgets or schedules that exceed the CBB. The CBB is a controlled value and cannot be changed by the contractor except as a result of customer contract actions.

QE LOI DISCUSSION

31.A.1. ARE PROJECT BUDGETS (CBB OR TAB) ONLY REVISED THROUGH PROJECT AUTHORIZATION FROM DOE?

Disciplined baseline change control helps maintain the relationship between the Contract Budget Base (CBB) at target cost and the project value (includes profit and/or fee). This ensures that the contractor PM is managing with performance measurement data that accurately reflects only the authorized scope of work.

Unauthorized revisions could inadvertently result in baseline budgets or schedules that exceed the CBB. The CBB is a controlled value and cannot be changed by the contractor except as a result of customer contract actions.

Typically, the contractor will issue a project authorization document at the total project level, at project award, and at subsequent revisions to the project value through modifications. These documents must track directly to the project value. The project authorization document is issued to the contractor PM, giving him the authority to plan the new work scope within the new or revised project budget and plan the CBB at target cost.

Authorization of budgets in excess of the CBB is known as an Over Target Baseline (OTB). This OTB is also known as reprogramming and is a significant undertaking by the contractor to replan the remaining baseline. When the amount of the over target budget is added to the CBB, an OTB results. This new value is known as the Total Allocated Budget (TAB).

In order to prevent unauthorized increases to the TAB and causing it to exceed the CBB value, prior approval is required between the contractor and the government for implementation of an Over Target Baseline (OTB). This approval process reinforces the mutual management of the project. Additionally, recognition of the OTB on cost reimbursement contracts notifies the DOE customer that additional funding will be required to complete the contract.

IMPACT OF NONCOMPLIANCE

Unauthorized revisions could inadvertently result in baseline budgets or schedules that exceed the contract budget base (CBB). Failure to maintain this one-to-one relationship between the CBB and the project value may also result in authorized work not being approved and budgeted if the CBB target cost does not reconcile with the value of the project that includes profit and/or fee.

GUIDELINE 32 – DOCUMENT PMB CHANGES

DOCUMENT CHANGES TO THE PERFORMANCE MEASUREMENT BASELINE.

PURPOSE OF THE GUIDELINE

Documented changes to the performance measurement baseline must always reflect the most current plan for accomplishing the effort.

MANAGEMENT VALUE OF THE GUIDELINE

Authorized changes must be incorporated into the PMB and authorization documents updated accordingly prior to the commencement of work. Documented changes made to the PMB must be traceable and substantiated. A baseline change control process governs authorized changes to work scope, period of performance, and budget in the CBB.

IMPACT OF NONCOMPLIANCE

Failure to properly document baseline changes results in a poor baseline that will be difficult to execute. This will also result in difficulty when implementing subsequent baseline changes.

QE LOI DISCUSSION

32.A.1. ARE AUTHORIZED CHANGES TO THE PMB DOCUMENTED AND TRACEABLE THROUGHOUT THE CONTRACTOR'S EVMS?

Using a disciplined, systematic change control process to document PMB changes provides assurance that everyone on the project team is using the same technical scope, schedule, and budget baselines to measure and manage performance. This enhances internal and external management confidence in the performance data that is used to make programmatic decisions. The PMB should always reflect the most current plan for accomplishing the effort. Authorized changes must be incorporated into the PMB and authorization documents updated accordingly prior to the commencement of work. Documented changes made to the PMB must be traceable and substantiated. The contractor's EVM SD must describe a process for proper documentation of baseline changes.

It is essential for baseline change requests to have supporting detail that shows, by control account, the time phased budgets by element of cost for the current baseline and the proposed baseline. This process allows for a proper review and approval of the proposed change, and subsequent incorporation into the baseline. The intent is to ensure the change documentation provides a clear description of what is changing. A "before and after" picture is often used to fully describe the change.

IMPACT OF NONCOMPLIANCE

Failure to properly document baseline changes results in a poor baseline that will be difficult to execute. This will also result in difficulty when implementing subsequent baseline changes.

7.0 INDIRECT CONSIDERATIONS

Indirect costs are a broad category that typically represents a majority of project costs and are defined as costs that cannot be directly charged to only one project but must be allocated. The term indirect includes all of the project burdens on direct work. Examples include overhead, General and Administrative (G&A), Cost of Money, and types of supervision that allocate their time.

Because indirect costs are significant when compared with total project costs, the earned value guidelines require that the structure is defined and the company organization or function is identified for the responsibility for controlling indirect (overhead) costs (Guideline 4), indirect costs are budgeted (Guideline 13), indirect actuals are accrued (Guideline 19), and indirect analysis is performed (Guideline 24). Although this process parallels at a high level the traditional application of earned value, there are differences that warrant this appendix:

- Indirect cost structures are different. Indirect costs are grouped into indirect pools, which are then allocated against the appropriate bases to yield the planned indirect rates.
- Indirect costs are typically annually based as planned rates, with adjustments at year end to actual rates.
- Indirect costs are not managed with a project schedule or IMS.
- The goal of indirect cost management is stability of overhead rates and control of indirect costs. Management of indirect costs may include scope reduction (example no 4^{th} quarter overhead training).
- The Chief Financial Officer (CFO) typically has overall responsibility for indirect management.
- Indirect costs are not managed through EVM CAs but rather through assignment of responsibility within the organization as typical in the accounting organization.
- Indirect analysis is performed by the responsible indirect cost manager but must also be considered by the project's control account managers during control account analysis.
- Change control management is not as relevant to indirect pools because of the annual planning and allocation of final costs for the year.

The contractor identifies the indirect pools and application bases in their Disclosure Statement and indirect policy. Each contractor may define pools and application bases differently to meet their respective corporate structures and business situations. However, each contractor must document who has responsibility for budgeting, charging, and analysis of major components in each significant pool in their accounting policy, procedures, authorization memos and/or their EVM SD.

DOE's interpretation of the intent of each of the four Indirect Considerations guidelines and expectations for implementing each guideline are below.

GUIDELINE 4 - IDENTIFY OVERHEAD MANAGEMENT

IDENTIFY THE ORGANIZATION OR FUNCTION RESPONSIBLE FOR CONTROLLING OVERHEAD (INDIRECT COSTS).

PURPOSE OF THE GUIDELINE

Ensure the contractor PM understands who within the company structure is responsible for establishing, approving, managing, controlling, and assigning resources to overhead (indirect costs) budgets.

MANAGEMENT VALUE OF THE GUIDELINE

The contactor must clearly identify the management position that is assigned the responsibility and authority for controlling indirect costs and that has the authority to approve the expenditure of resources. It is necessary to have an indirect budgeting and forecasting process since indirect costs account for a major portion of the cost on any project. As indirect costs can significantly impact the cost of a project, it is important for the contractor PM to know who is responsible for authorizing and controlling overhead (indirect) budgets and expenditures.

Visibility into indirect costs is essential for successful management of a project. The impact of indirect costs on any project must be accounted for and managed. It is important, therefore, to have processes documented and organizations established specifically to manage and control indirect costs. This will help the contractor PM effectively manage and control execution of overall project objectives.

Indirect costs are for common activities that cannot be identified specifically with a particular project or activity and should typically be budgeted and controlled separately at the functional or organizational manager level. Typical indirect costs include overhead, burden, Cost of Money and General and Administrative (G&A).

The EVM SD and/or indirect procedures must clearly identify managers who are assigned responsibility and authority for controlling indirect costs and who have the authority to approve expenditure of resources. The process for management and control of indirect costs, including assignment of responsibility, is documented in the contractor's Cost Disclosure Statement, the responsible organization's approved accounting procedures, and the EVM SD at various levels.

IMPACT OF NONCOMPLIANCE

Since indirect costs account for a major portion of the project costs, the contractor PM will not be able to effectively manage and control execution of the overall project objectives.

QE LOI DISCUSSION

4.A.1. DOES A DISCLOSURE STATEMENT OR OTHER DOCUMENT DEFINE THE INDIRECT COST STRUCTURE, BURDEN BASE AND THE TYPE OF COST INCLUDING THE ELEMENTS OF COST CONTAINED IN EACH DEFINED RATE?

The contractor must have formal (written) procedures for identifying the applicable pools and cost elements. These procedures must also identify the method used to allocate costs from the pools to the appropriate receiving bases.

The need for these descriptions will exist in the contractor's EVM SD that will reference the actual descriptions located in the contractor's Disclosure Statement and internal accounting procedures/instructions. The contractor must perform periodic internal audits of the system to ensure that the procedures describing the handling of indirect costs are being adhered to.

The contractor also has the responsibility to propose indirect budgets and to account for these budgets and the distribution of actual indirect costs in accordance with the government approved Disclosure Statement. The contractor has the responsibility to handle indirect budgets and costs in accordance with generally accepted accounting principles (GAAP) described in the contractor's accounting procedures.

The contractor's accounting procedures must define the indirect cost structure, the burden base and the type of cost contained in each defined rate since indirect costs account for a major portion of the costs of any project/contract. Indirect costs exist in essentially three broad categories.

- The first category is for overhead costs for services that benefit more than a single project/contract. Examples may include routine building costs. These costs benefit multiple-projects and therefore are an overhead cost.
- The second category may include the indirect burdens that are costs associated with employees, over and above gross compensation or payroll costs. Typical costs associated with the burden rate include payroll taxes, workers' compensation and health insurance, paid time off, training and travel expenses, vacation and sick leave, pension contributions and other benefits.
- A third type of indirect costs is classified as general and administrative (G&A) expenses. Expenditures may relate to the day-to-day operations of a business. General and administrative expenses pertain to operation expenses rather that to expenses that can be directly related to the production of any goods or services. General and administrative expenses include rent, utilities, insurance and managerial salaries.

Facilities capital cost of money is another type of indirect costs that is an allowable cost and legally can be charged to government contracts. It is a formula based allocation applied on a contract similar to overhead. It helps offset government unique working capital costs required to execute the project.

IMPACT OF NONCOMPLIANCE

Failure to define the indirect cost structure, burden base and the type of cost contained in each defined rate could cause indirect costs to be allocated, budgeted and collected in an inconsistent manner and can lead to a lack of indirect cost control and serious cost-overrun problems for projects.

4.A.2. IS THERE A PROCESS THAT CLEARLY REFLECTS HOW INDIRECT COST RESPONSIBILITY IS ESTABLISHED, BUDGETS ARE DEVELOPED, AUTHORITY IS CONTROLLED FOR EXPENDITURES, THRESHOLDS ARE PUBLISHED, EXPENSES ARE CONTROLLED, AND VARIANCE ANALYSIS IS PERFORMED AS NECESSARY?

This QE LOI defines the management process for indirect rate pools including both the base and numerator aspects. Those designated should be consistent with company organization structures

and indirect procedures. Those responsible should also have documented authority, within limits, over charges within the pools.

It is expected that contractors will define those responsible for development and control of indirect budgets and expenditures. Additionally, the contractor should define thresholds and a process for management by exception for indirect performance and analysis. It is also expected that the SD, indirect policies and disclosure statement will be consistent with all of the defined indirect responsibility and implementation.

IMPACT OF NONCOMPLIANCE

Failure to provide written procedures that clearly define the indirect cost processes could lead to ineffective management and control of indirect costs – leading to significant cost overruns for the project.

4.A.3. IS THE LEVEL OF INDIRECT COST ALLOCATION AND MANAGEMENT WITHIN THE PROJECT DEFINED IN THE CONTRACTOR'S SYSTEM DESCRIPTION OR DETAILED INDIRECT PROCEDURES?

The contractor must define within the EVM SD or detailed indirect procedures how indirect costs will be allocated and applied within the project budgets. This process is typically defined at the control account/WP level, i.e., indirect rates are applied against the direct budgets within the WP to generate indirect budget. This is generally referred to as burdening the direct costs. This level of burdening is typically consistently applied across all projects; however, in some cases specific project directives may direct otherwise. While the CAMs bear full responsibility for managing and analyzing direct costs, the contractor will assign responsibility for managing and analyzing indirect costs at a higher level or to the project controls group. (See Guideline 24.)

IMPACT OF NONCOMPLIANCE

Failure to define and document the contractor's level of indirect cost allocation and management for projects could lead to an inequity of cost allocation to projects and a lack of cost control and serious cost overrun problems.

GUIDELINE 13 - ESTABLISH OVERHEAD BUDGETS

ESTABLISH OVERHEAD BUDGETS FOR EACH SIGNIFICANT ORGANIZATIONAL COMPONENT FOR EXPENSES WHICH WILL BECOME INDIRECT COSTS. REFLECT IN THE PROGRAM BUDGETS, AT THE APPROPRIATE LEVEL, THE AMOUNTS IN OVERHEAD POOLS THAT ARE PLANNED TO BE ALLOCATED TO THE PROGRAM AS INDIRECT COSTS.

PURPOSE OF THE GUIDELINE

Ensure indirect budgets (e.g., Overhead, General & Administrative, and Cost of Money) are established and included in the Performance Measurement Baseline (PMB) at the appropriate level for visibility.

MANAGEMENT VALUE OF THE GUIDELINE

Project indirect costs are for common activities that cannot be identified specifically with a particular project or activity and are budgeted and controlled separately at the functional or organizational manager level. (See Guideline 4.) Indirect budgets play an important role in budgetary control and management and can account for a major portion of the cost of any project. The overall value of establishing indirect budgets lies with the ability of the contractor to manage cost elements that cannot be directly assigned to individual projects or project tasks and ensures that indirect costs allocated to projects are applied fairly and appropriately. Without this budgeting requirement, the PMB would not accurately measure total cost to the government based on contractor performance/progress. By comparing actual indirect expenses to established indirect budgets, the company can determine if the absorption of indirect expenses based on existing documented allocation schemes is on track or if allocation rates will need to be adjusted. The accurate assignment of indirect expenses assures each project will receive the appropriate allocation of indirect costs.

The contractor must establish indirect (overhead, burden, cost of money, and G&A expense) budgets at the appropriate organizational level for each pool and cost sub-element. Project-specific budgets for indirect costs are developed and planned in conjunction with the direct budgets and must be consistent with the contractor's documented procedures for how indirect costs are approved and allocated to the project. This methodology is normally described in the organization's accounting procedures.

IMPACT OF NONCOMPLIANCE

Indirect budgets play an important role in budgetary control and management and can account for a major portion of the cost of any project. Without this budgeting requirement, the PMB would not accurately measure total cost to the government based on contractor performance/progress.

QE LOI DISCUSSION

13.A.1. ARE INDIRECT BUDGETS ESTABLISHED AND PROJECTED, ANNUALLY AT A MINIMUM, FOR EACH ORGANIZATION WHICH HAS AUTHORITY TO INCUR INDIRECT COSTS?

Each functional organization that has the authority to incur indirect costs must be accountable for the establishment, maintenance, and control of its own indirect budget. The indirect budget must be established well in advance of any actual indirect incurrence and will represent a planned baseline

to measure actual indirect expenditures against. These indirect budgets are typically established on an annual basis, which is the minimum for effective cost control. The indirect budgets should be developed facility wide as applicable, take into account the potential business base, and be projected in a logical and consistent manner.

IMPACT OF NONCOMPLIANCE

Without establishment of indirect budgets on a regular basis, the contractor has no ability to establish indirect rates and properly allocate indirect costs.

13.A.2. ARE INDIRECT BUDGETS INCORPORATED INTO THE PMB IN CONCERT WITH DOCUMENTED PROCESSES AND CURRENT RATES (I.E., APPROVED, PROVISIONAL, PROPOSED)?

Just as with direct budgets, indirect budgets must be included in the PMB using the current rates to ensure the PMB represents a realistic baseline plan as specified in the Contractor's EVM SD.

The most current set of rates must be used when planning the initial baseline and subsequent baseline changes. These rates may be either: forward pricing rate proposed (FPRP), forward pricing rate provisional, or forward pricing rate approved (FPRA). Should these rates not cover the entire duration of the project, the contractor must extend the rates to the out years on the same basis, using a sound estimate for the indirect pools and potential business base. Note that these are the budgeted rates and applied to budgeted direct costs (BCWS) and also used in BCWP calculations. The "applied" rates are updated for actual costs over the course of a year and are applied to the actual direct costs for ACWP reporting. (See 19.A.2 for more information on applied rates.)

IMPACT OF NONCOMPLIANCE

Failure to include realistic indirect budgets in the PMB would invalidate the PMB as a realistic baseline plan.

GUIDELINE 19 - RECORD/ALLOCATE INDIRECT COSTS

RECORD ALL INDIRECT COSTS THAT WILL BE ALLOCATED TO THE PROGRAMGRAM.

PURPOSE OF THE GUIDELINE

Ensure all indirect costs are properly and correctly allocated in a consistent manner to the contract(s) that apply and at the level where overhead budgets are established.

MANAGEMENT VALUE OF THE GUIDELINE

The potential negative cost impact of poor indirect cost performance to a project mandates that the contractor manage these costs as effectively as possible. The availability of auditable actual indirect costs supports management's efforts in this critical area. A documented process established specifically to provide visibility into the management/control of indirect costs is essential for successful project management.

Allocating indirect costs to a project consistent with the level where overhead budgets have been established facilitates analysis of overhead variances (i.e., budgeted values for indirect costs versus the actual indirect costs allocated) and potential management action(s) to control costs. Policies and procedures should ensure that the allocation of cost to a product, contract, or other cost objective is the same for all similar objectives. Indirect costs are allocated per the contractor's documented procedures to ensure that all projects benefiting from the expenditure of indirect costs are allocated their portion of those costs. If incurred indirect costs vary significantly from budgets, periodic adjustments should be made to prevent the need for a significant year-end adjustment. (See Guidelines 27 and 29). Indirect Cost allocation processes must ensure management responsibility for indirect cost management is aligned with the authority to manage indirect costs to support effective cost control.

Indirect costs are for common activities that cannot be identified specifically with a particular project or activity and must typically be budgeted and controlled separately at the functional or organization managerial level. The CAS disclosure statement must identify the allocation base and indirect cost pools by functional element of cost.

The following activities are associated with the recording and allocation of indirect costs:

- Record all incurred indirect costs for the project in the accounting system.
- Allocate them to the recorded direct costs per the documented procedure to ensure that all projects benefiting from the indirect costs receive the appropriate allocation.
- If incurred indirect costs vary significantly from budgets, periodic adjustments must be made to prevent the need for a significant year-end adjustment. (See Guidelines 13.a.5).
- Indirect cost allocation processes must ensure management responsibility for indirect cost management is aligned with the authority to manage indirect costs to support effective cost control.

IMPACT OF NONCOMPLIANCE

Failure to establish a process specifically to provide visibility into the management/control of indirect costs could distort contractor data being generated by the EVM system and could impact the project EAC.

QE LOI DISCUSSION

19.A.1. ARE INDIRECT COSTS CHARGED TO THE APPROPRIATE INDIRECT POOLS?

The contractor has the responsibility through internal audits to assure that indirect charges are properly recorded throughout the accounting structure. The contractor also has the responsibility to assure that such costs are not duplicated (i.e. that they are not charged to more than one pool nor charged to both an indirect pool and at the same time to a direct/allowable cost element).

Because of the nature of pooled costs, entry errors are more difficult to detect than with direct costs. Periodically, reviews must be made to assure that indirect costs are being charged to the appropriate indirect pools and by the appropriate incurring organization. Typical overhead categories may include custodial, security, computing equipment. A contractor should insure that custodial only has custodial type charges.

IMPACT OF NONCOMPLIANCE

The lack of clear definition of organizational assignments and authority level for each indirect pool/category can lead to a lack of indirect cost control and to serious cost overrun problems for projects.

19.A.2. ARE THE INDIRECT RATE ADJUSTMENTS APPLIED CONSISTENTLY AMONG ALL APPLICABLE PROJECTS?

The allocation of cost to a product, contract or other cost objective must be the same for all similar objectives. That is, if direct labor dollars are the basis for allocating overhead on one contract, they must be the basis across all contracts. Also, if indirect rate adjustments are being applied to one project, they must be applied consistently among all applicable projects. Unless identical bases and rates for allocating costs among projects are used for allocations from indirect cost pools, double accounting or over-allocation and under-allocation of the pool costs is likely to occur.

Furthermore, the contractor has the responsibility to periodically review the allocation formula used for indirect costs, i.e., the applied indirect rate, to assure that the applied rate reasonably reflects the actual indirect costs being incurred. If incurred indirect costs vary significantly from the budgeted indirect pool expenses, periodic adjustments must be made to prevent the necessity for a significant year-end adjustment.

Indirect cost adjustments can be made on a monthly basis by utilizing cumulative data information rather than single-month data as the basis for allocation of indirect costs to contracts. Unless these periodic adjustments are made when actual indirect cost rates significantly vary from the budgeted rates, contractor data being generated by the performance measurement system will be distorted.

IMPACT OF NONCOMPLIANCE

The failure to apply indirect rate adjustments consistently among all applicable projects over and/or under-allocation of the pool costs is likely to occur and contractor data being generated by the EVM system will be distorted which could impact the project EAC.

GUIDELINE 24 - ANALYZE INDIRECT COST VARIANCES

IDENTIFY BUDGETED AND APPLIED (OR ACTUAL) INDIRECT COSTS AT THE LEVEL AND FREQUENCY NEEDED BY MANAGEMENT FOR EFFECTIVE CONTROL, ALONG WITH THE REASONS FOR ANY SIGNIFICANT VARIANCES.

PURPOSE OF THE GUIDELINE

Indirect cost variances are regularly identified and reviewed for insight into their impact on overall project cost performance. This will facilitate project management's ability to forecast future indirect cost performance as well as develop corrective action plans intended to regain project objectives. Ongoing indirect cost analysis provides visibility into potential indirect cost overruns and the opportunity to develop and implement management action plans to meet project objectives.

MANAGEMENT VALUE OF THE GUIDELINE

The overall value to the contractor is visibility into the absorption of indirect costs that cannot be directly applied to a contract. Managing indirect costs on a continuing basis enables the contractor to adjust rates in a timely manner so as to complete an accurate estimate at completion for individual projects/contracts. Project management must understand that ongoing indirect cost analysis provides visibility into potential indirect cost overruns or underruns and the opportunity to develop and implement management action plans. This effect must be considered when developing and analyzing the Estimate to Complete (ETC). Indirect costs are allocated to a contract consistent with the procedures described in the contractor's Cost Accounting Standards Board (CASB) Disclosure Statement.

Threshold identification and analysis of indirect cost variances are conducted at the level where overhead budgets have been established and where ongoing, periodic reviews of indirect cost performance are conducted. The results of the analysis of indirect cost variances must be documented. This analysis provides project management visibility into the reasons for potential or realized indirect cost performance deviations that contribute to the contract's overall cost and impacts to the ETC. The analysis also enables the management team to take corrective actions to mitigate their impact. If significant differences between budgeted and actual indirect costs occur, periodic adjustments should be made to prevent the need for a significant year-end adjustment.

Indirect rate forecast and control are crucial to meeting project cost objectives. This guideline requires a monthly indirect cost analysis to be performed by those assigned responsibility, comparing indirect budgets to indirect actual costs and explaining the cause of resultant variance(s). The importance of analyzing indirect cost performance requires the exercise of maximum discipline in following the established indirect cost control procedures. The results of indirect analysis are provided to project and business managers for their use in forecasting the impact to the project EAC.

IMPACT OF NONCOMPLIANCE

Management would not have visibility into potential indirect cost overruns and the opportunity to develop and implement management action plans to meet project objectives.

QE LOI DISCUSSION

24.A.1. ARE THERE VARIANCE THRESHOLDS ESTABLISHED FOR INDIRECT POOL VARIANCE ANALYSIS AND REPORTING?

Indirect pools such as Overhead, Burdens, or G&A must each have thresholds established for indirect performance of the base and expenses. These thresholds may be established annually or formally documented in an accounting policy. The unique aspect of indirect analysis is that rates are typically an annual cycle with year-end adjustments to zero. Therefore, logically, the thresholds may vary by month within the year to accommodate typical timing differences, with the later months having tighter thresholds. Thresholds for indirect costs are also very different than project control account thresholds. An example with an annual cycle from January to December is as follows:

Month	Threshold
January	10%
February	9%
March	9%
April	8%
May	8%
June	6%
July	2%
Aug	2%
Sept	2%
Oct	2%
Nov	2%
Dec	2%

Figure 19 - Example thresholds for indirect pool variance analysis

IMPACT OF NONCOMPLIANCE

Failure to document thresholds can indicate a risk for large adjustments to project costs and result in funding shortages.

24.A.2. ARE THE RESULTS OF INDIRECT VARIANCE ANALYSIS PROVIDED TO THE APPROPRIATE LEVEL OF PROJECT MANAGEMENT ON A ROUTINE BASIS?

This QE LOI ensures that the indirect variance analysis is provided to the capital assets projects to support the EAC update process. From the project perspective, one of the benefits of indirect analysis is gaining an understanding of the potential impacts. Rates can be significant drivers of overall project costs. Typically the appropriate level of management would be the contractor PM and/or project controls analyst.

IMPACT OF NONCOMPLIANCE

Failure to integrate indirect analysis with project level EAC analysis can significantly understate total project costs.

APPENDIX A – ACRONYMS AND ABBREVIATIONS

ACWP	Actual Cost of Work Performed
AUW	Authorized Unpriced Work
BAC	Budget at Complete
BCR	Budget Change Request
BCWP	Budgeted Cost for Work Performed
BCWR	Budgeted Cost for Work Remaining
BCWS	Budget Cost for Work Scheduled
BOE	Basis of Estimate
BOM	Bill of Material
CA	Control Account
CAM	Control Account Manager
CAP	Control Account Plan
CAS	Cost Accounting Standards
CBB	Contract Budget Base
CD	Critical Decision
CP	Critical Path
CPM	Critical Path Method
CPI	Cost Performance Index
CPR	Contract Performance Report
CTC	Contract Target Cost
CTP	Contract Target Price
CUM	Cumulative
CUR	Current
CV	Cost Variance
CWBS	Contract Work Breakdown Structure
DOE	Department of Energy
EAC	Estimate at Complete
EIA-748	Electronic Industries Association - 748
EOC	Elements of Cost
ETC	Estimate to Complete
EV	Earned Value
EVM	Earned Value Management
EVMS	Earned Value Management System
EVMSIH	Earned Value Management System Interpretation Handbook
EVT	Earned Value Techniques
FF	Finish-Finish
FPD	Federal Project Director
FPRA	Forward Pricing Rate Agreement
FPRP	Forward Pricing Rate Proposal
FS	Finish-Start
G&A	General and Administrative
GFE	Government Furnished Equipment
GFM	Government Furnished Material
HDV	High Dollar Value (material)
IEAC	Independent Estimate at Completion

IECD	Independent Estimated Completion Date
IH	Interpretation Handbook (EVM)
IMP	Integrated Master Plan
IMS	Integrated Master Schedule
IPMR	Integrated Project Management Report
IPT	Integrated Product Team
LDV	Low Dollar Value (material)
LOE	Level of Effort
LOI	Lines of Inquiry (See Qualifying Expectation)
M&O	Management & Operating Contract (M&O) Contractor
MR	Management Reserve
NCC	Negotiated Contract Cost
NTE	Not to Exceed
OBS	Organizational Breakdown Structure
ODC	Other Direct Costs
OTB	Over Target Baseline
OTS	Over Target Schedule
PARSII	Project Performance and Reporting System
PEP	Project Execution Plan
PERT	Project Evaluation and Review Technique
PM	Project Manager
PMB	Performance Measurement Baseline
PM	Project Management Oversight and Assessments
POP	Period of Performance
PP	Planning Package
PWS	Performance Work Statement
QBD	Quantifiable Backup Data
QE	Qualifying Expectation
RAM	Responsibility Assignment Matrix
SD	System Description
SF	Start-Finish
SLPP	Summary Level Planning Package
SM	Schedule Margin
SOW	Statement of Work
SPI	Schedule Performance Index
SS	Start-Start
SV	Schedule Variance
SVT	Schedule Visibility Task
TAB	Total Allocated Budget
TPC	Total Project Costs
TCPI	To-Complete Performance Index
UB	Undistributed Budget
VARS	Variance Analysis Reports
VAC	Variance at Complete
WAD	Work Authorization Document
WBS	Work Breakdown Structure
WP	Work Package

APPENDIX B – DEFINITIONS AND SOURCES

Actual Cost of Work Performed (ACWP)	The costs actually incurred and recorded in accomplishing work performed; also referred to as Actual Cost (AC). (1)
Authorized Unpriced Work (AUW)	Work that the customer has authorized to be performed, but for which a formal proposal has not been negotiated. (1)
Budget at Complete (BAC)	The total authorized budget for accomplishing the project scope of work. It is equal to the sum of all allocated budget plus any undistributed budget (Management Reserve is not included). The Budget at Completion will form the Performance Measurement Baseline, as it is allocated and time-phased in accordance with project schedule requirements. (1)
Budget Change Request (BCR)	In-scope to the Performance Baseline (PB), BCRs document events that only require an internal adjustment to the performance baseline components and that do not change the TPC, CD-4 date, or represent a change to some feature of the projects scope/Key Performance Parameters (KPPs) approved by the applicable Acquisition Executive. It may necessitate a contract action and/or changes to contractor documentation used to maintain configuration control (at the project level) of the Contract Budget Base (CBB) and/or Performance Measurement Baseline (PMB). While BCR is a common industry term, some contractors may use other terms as defined in their Earned Value Management (EVM) System Descriptions. While the following terms and definitions are suggested to provide a common understanding of the different types of BCRs possible, this does not mandate contractor's changing their EVM System Descriptions. Objective evidence supporting the change should be maintained with the BCR, and all changes should be reconcilable and traceable via project documentation and required EVMS budget logs. • Budget Change Request – PMB (BCR-P): A type of BCR used by the contractor to maintain configuration control of the PMB for re-planning actions for remaining work scope. A normal program control process accomplished within the scope, schedule, and cost objectives of the project's PMB. A BCR-P requires Project Manager's approval prior to implementation. A BCR-P implements changes to the time phasing of the PMB only. A BCR-P does not include MR utilization and does not modify the contract.

	• Budget Change Request – MR (BCR-M): A type of BCR used by the contractor to allocate MR to Control Accounts within the PMB for authorized purposes. A BCR-M requires Project Manager's approval prior to implementation. A BCR-M does not modify the contract. • Budget Change Request – Contingency (BCR-C): A type of BCR used by the FPD to allocate project contingency to the contract for a change of scope to the contract. It results in a change to the Contract Budget Base (CBB) (project level) and requires Contracting Officer action to modify the contract. [Note: There may be approval thresholds defined in the PEP.] (1)
Budgeted Cost for Work Performed (BCWP)	The value of completed work expressed in terms of the budget assigned to that work. (1)
Budgeted Cost for Work Remaining (BCWR)	The budgeted value for work remaining. It is calculated as BAC minus the BCWPcum (i.e. BCWR = BAC - BCWPcum). Note: ETC is the estimate to complete the BCWR. (1)
Budgeted Cost for Work Scheduled (BCWS)	The time-phased budget plan for work currently scheduled, also referred to as Planned Value (PV). (1)
Basis of Estimate (BOE)	A part of a Cost Estimating Package or stand-alone document supporting a cost estimate. The BOE should describe the design basis, the planning basis (significant features and components, proposed methods of accomplishment, and proposed project schedule), the risk basis, supporting research and development requirements (important when new technologies are contemplated for certain components, equipment or processes), special construction or operating procedures, site conditions, the cost basis, and any other pertinent factors or assumptions that may affect costs. (1)
Bill of Material (BOM)	A listing of material items required to complete the production of a single unit. When actual or expected prices are applied, it becomes the Priced Bill of Materials (PBOM). (2)
Control Account (CA)	The intersection of one WBS and one OBS representing a discrete portion of program scope assigned to an individual manager. The control account is the minimum level where technical, schedule, and cost responsibility exists. (NDIA IPMD PASEG v3)
Control Account Manager (CAM)	The individual responsible for cost, schedule and technical performance of the scope within a control account (also typically responsible for the creation, status, and maintenance of the IMS tasks within the control account). (NDIA IPMD PASEG v3)
Control Account Plan (CAP)	A CAP is a time phased report of the budget spread by element of cost for the control account. (1)

Contract Budget Base (CBB)	The sum of the negotiated contract cost plus the estimated cost of authorized unpriced work. This represents the total amount of performance measurement budget that may be allocated to contract work. (See Total Allocated Budget). (2)
Critical Decision (CD)	A formal determination made by the Chief Executive for Project Management or Project Management Executive at a specific point during the project that allows the project to proceed to the next phase or CD. (1)
Cost of Money (COM)	An imputed cost determined by applying a cost-of-money rate to facilities capital employed in contract performance or to an investment in tangible and intangible assets while they are being constructed, fabricated or developed for the contractor's own use. (http://www.lectlaw.com/def/c187.htm) (3)
Contract Performance Report (CPR)	Contract cost and schedule performance data that is used to identify problems early on an acquisition contract and forecast future contract performance in Earned Value Management (EVM). (Source: AcqNotes.com) Report content was prescribed by DOD Data Item Description DI-MGMT-81466A. (DOE G 413.3-10A) (Note: The Integrated Program Management Report (IPMR) Data Item Description (DOE Version) integrates the CPR and the IMS.). Contractually required reports, prepared by the contractor, containing performance information derived from the internal EVMS. Provides status of progress on the contract. (1)
Critical Path (CP)	A sequence of discrete WPs and planning packages (or lower level tasks/activities) in the network that has the longest total duration with the least amount of total float/slack through an end point that is calculated by the schedule software application. (2)
Cumulative (CUM)	Refers to reporting the summation of BCWS, BCWP, and/or ACWP from the initial reporting through the end of the current reporting period. (DOE IPMR DID)
Current (CUR)	Refers to reporting the BCWS, BCWP, and ACWP for the current reporting (accounting month end) period. (DOE IPMR DID)
Data Date	The date that the scheduling tool treats as "today" (also known as the update, time now, or status date) - all dates "to the left" of data date are considered by the scheduling tool to be "in the past" - all dates "to the right" of the data date are considered by the scheduling tool to be "in the future". (NDIA IPMD PASEG v3)
Driving Path	The longest sequence of discrete tasks/activities from time-now to a selected interim contract milestone. Discrete tasks/activities on the driving path have the least amount of total float/slack to the interim contract milestone. Driving path may not be part of the contract critical path. (2)

Estimate at Complete (EAC)	Actual cost of work completed to date plus the predicted costs and schedule for finishing the remaining work. The current estimated total cost for project authorized work. EAC equals the actual cost to a point in time plus the estimated costs to completion. (1)
Electronic Industries Association –748 (EIA-748)	Standard that establishes the framework for a contractor's EVMS; consists of 32 Guidelines, used to determine compliance. (Derived from FAR Subpart 34.2 and 52.234; DOE Order 413.3B)
Elements of Cost (EOC)	Product costs are decomposed into the elements of cost. These elements are comprised of labor, materials, other direct costs and overhead. EOCs represent the cost of products that are typical across industry. (2)
Estimate to Complete (ETC)	Estimate of costs to complete all authorized work from a point in time to the end of the program/project or task. (1)
Earned Value (EV)	See Budgeted Cost for Work Performed (BCWP). (1)
Earned Value Management (EVM)	A program management technique for measuring program performance and progress in an objective manner. (1)
Earned Value Management System (EVMS)	An integrated management system that integrates the work scope, schedule, and cost parameters of a program in a manner that provides objective performance measurement data. It measures progress objectively with earned value metrics; accumulates direct costs; allows for analysis of deviations from plans; facilitates forecasting the achievement of milestones and contract events; provides supporting data for forecasting of estimated costs; and fosters discipline in incorporating changes to the baseline in a timely manner. (1)
Earned Value Technique (EVT)	A specific technique (e.g., Milestone Method, Percent Complete, 50/50, 0/100, Units Complete, Apportioned Effort, LOE, etc.) selected to represent the measurement of work scope progress and accomplishment in a work package. (2)
Finish-to-Finish (FF)	A logical relationship used in the IMS network that establishes the following rule between two activities: the succeeding task cannot finish until a preceding task finishes. (1)
Forward Pricing Rate Agreement (FPRA)	A written agreement negotiated between a contractor and the Government to make certain rates available during a specified period for use in pricing contracts or modifications. These rates represent reasonable projections of specific costs that are not easily estimated for, identified with, or generated by a specific contract, contract end item, or task. These projections may include rates for such things as labor, indirect costs, material obsolescence and usage, spare parts provisioning, and material handling. (1)

Finish-to-Start (FS)	A logical relationship used in the IMS network that establishes the following rule between two activities: the succeeding task cannot start until a preceding task finishes. (1)
Freeze Period	A period of time when baseline changes are limited. See Guideline 29 for information on exceptions to making baseline changes within the freeze period. (2)
General and Administrative (G&A)	Any management, financial, and other expense which is incurred by or allocated to a business unit and which is for the general management and administration of the business unit as a whole. G&A expense does not include those management expenses whose beneficial or causal relationship to cost objectives can be more directly measured by a base other than a cost input base representing the total activity of a business unit during a cost accounting period. (1)
Generally Accepted Accounting Principles (GAAP)	The standard framework of guidelines for financial accounting used in any given jurisdiction; generally known as accounting standards or standard accounting practice. (2)
Government Furnished Equipment (GFE)	A tangible item provided by the Government in a contract that is functionally complete for its intended purpose, durable, nonexpendable, and needed for the performance of a contract. Equipment is not intended for sale, and does not ordinarily lose its identity or become a component part of another article when put into use. Equipment does not include material, real property, special test equipment or special tooling. (adapted from FAR 45.101) Note: equipment can include assemblies, components, parts, and engineered items. (1)
Government Furnished Material (GFM)	Material furnished by the Government consumed or expended in performance of a contract, component parts of a higher assembly, or items that lose their individual identity through incorporation into an end-item. Material does not include equipment, special tooling, special test equipment or real property. Property includes assemblies, components, parts, raw and processed materials, and small tools and supplies. (1)
High Dollar Value (material) (HDV)	Major components, assemblies, or critical piece-part items, etc. that are identified based on an analysis of material categories a company needs to procure and consume in the integration and build of an end item on a program. (2)
Horizontal Integration	The logical relationships and time-phasing between tasks and milestones from program start to finish. (2)
Integrated Master Plan (IMP)	A top level program plan / hierarchy that is decomposed into program events, event accomplishments, and accomplishment criteria, the IMP is typically not time phased and often serves as the basis for the program Integrated Master Schedule (IMS). (1)

Integrated Master Schedule (IMS)	The IMS is an integrated, multi-layered, networked and resource-loaded schedule containing all the detailed discrete work packages and planning packages (or lower level tasks or activities) necessary to support the events, accomplishments, and criteria of the IMP. The IMS connects all the scheduled work of the Government, the contractor, and external effort in a network of logically linked sequences of activities from project start to project completion. The IMS shall be vertically and horizontally traceable for all discrete work. The IMP events, accomplishments, and criteria are duplicated in the IMS. Detailed tasks are added to depict the steps required to satisfy criterion. The IMS should be directly traceable to the IMP and should include all the elements associated with development, production or modification, and delivery of the total product and program high level plan. Durations are entered for each discrete work package and planning package (or lower level task or activity), along with predecessor and successor relationships, and any constraints that control the start or finish of each work package and planning package (or lower level task or activity). The result is a fully networked and resource-loaded "bottom up" schedule that supports critical path analysis. It should be noted that although durations are assigned at the work package and planning package (or lower level task or activity) level, these durations will roll up to show the overall duration of any event, accomplishment, or criterion. When Level of Effort (LOE) work packages, tasks, or activities are included in the IMS, they shall be clearly identified as such. LOE shall never drive the critical path.
Integrated Program Management Report (IPMR)	A contractually required report, prepared by the contractor, containing performance information derived from the internal Earned Value Management System. Provides status of contract cost and schedule performance). The IPMR is being phased in to replace the Contract Performance Reports (DI-MGMT-81466A) and the Integrated Master Schedule (DI-MGMT- 81650). (2)
Integrated Product Team (IPT)	A cross-functional group of individuals organized for the specific purpose of delivering a project to an external or internal customer. It is led by a Federal Project Director. The IPT is accountable for planning, budgeting, procurement and life-cycle management of the investment to achieve its cost, schedule, and performance goals. Team skills include: budgetary, financial, capital planning, procurement, user, program, architecture, earned value management, security, and other staff as appropriate. (1)
Low Dollar Value (material) (LDV)	Normally consists of high quantity, low-value and low-risk material items (e.g., material that is consumable such as bolts, fasteners, welding rods, etc.). (2)

Level of Effort (LOE)	Baseline scope of a general or supportive nature for which performance cannot be measured or is impracticable to measure using activity-based methods. Resource requirements are represented by a time-phased budget scheduled in accordance with the time the support will likely be needed. The value is earned by the passage of time and is equal to the budget scheduled in each time period. (1)
Lines of Inquiry	(See Qualifying Expectation)
Management & Operating Contract (M&O) Contractor	A Contracting Organization responsible for executing for a government site or grouping of facilities functions such as construction, repairs, physical plant operations, maintenance, equipment and systems stewardship, project and activity management, program and service personnel management, decommissioning, and waste management. (1)
Management Reserve (MR)	2. Management Reserve is an amount of the total contract budget withheld for management control purposes by the contractor for unexpected growth within the currently authorized work scope, rate changes, risk and opportunity handling, and other project unknowns. It is held outside the Performance Measurement Baseline but within the Contract Budget Base unless there is an OTB. (1)
Near Critical Path	The second, third, fourth, (etc.) longest sequence of tasks from time now to the project end date. (NDIA IPMD PASEG v3)
Not to Exceed (NTE)	When the contracting officer formally authorizes the contractor to proceed with not yet negotiated work, a not-to-exceed (NTE) value is often established. The NTE is strictly a funding limit, and a contractor is required to observe the limit as the not yet negotiated work is underway. The full estimate associated with the authorized but not yet negotiated work is reflected as AUW. The budget for the work associated with the NTE may be distributed to control accounts, but the remainder must reside in UB until negotiations are complete and the contract modification is issued. (See AUW in source 1)
Organizational Breakdown Structure (OBS)	A tool that can be used by the project management team and/or project management team leader in a hierarchal manner for the purposes of conducting and creating a thorough and clearly delineated depiction of the project organization for the purposes of the identification of responsibility within the project. The CAM is typically the lowest level of the OBS. The OBS should be established at the onset of the project to help in the purposes of organization; however, it is possible to conduct this in an ongoing basis. (1)

Other Direct Costs (ODC)	An ODC is a cost that can be identified specifically with a final cost objective that the contractor does not treat as a direct material cost or a direct labor cost. There are several additional direct costs that can be proposed by the contractor. These additional costs include: • Special tooling, test equipment; • Computer services; • Consulting services; and • Travel. • Federal excise taxes; • Royalties; • Preservation, packaging, and packing costs; and • Preproduction costs. (1)
Overhead	1. Indirect costs other than those related to general and administrative expense and selling expenses. (FAR 31.203(b)) 2. A general term often used to identify any indirect cost. (1)
Over Target Baseline (OTB)	A project management tool that may be implemented when the cost overrun to the CBB is formally incorporated into the PMB for management purposes. An OTB is implemented to regain an executable baseline for performance measurement; there is no change to the contract requirements or schedule. The CBB does not change when an OTB is implemented. An OTB allows contractor PMs to retain visibility into the original CBB while measuring performance when a contract experiences an overrun. In an overrun condition, the revised TAB is equal to the sum of the CBB and the recognized overrun. (Note: Contractor OTBs required DOE approval.) (1)
Over Target Schedule (OTS)	A condition where the baseline schedule is time-phased beyond the contract's project completion date. While an OTS may be implemented without adding additional budget, normally an OTS also results in an OTB. (1)
Program Evaluation and Analysis Technique (PERT-Cost)	An earned value technique calculating Budgeted Cost for Work Performed (BCWP) by comparing the Actual Cost of Work Performed (ACWP) of received material to the expected total cost for that material (Estimate at Complete (EAC)) and applying the resulting percentage to the originally budgeted value for the material (Budget at Complete (BAC)), BCWP = (ACWP/EAC) x BAC. (2)
Project Performance and Reporting System (PARSII)	A reporting process to connect field project status with headquarters to report and compare budgeted or scheduled project forecasts. (1)

Project Execution Plan (PEP)	DOE′s primary document for management of a project. It establishes the policies and procedures to be followed in order to manage and control project planning, initiation, definition, execution, and transition/closeout, and uses the outcomes and outputs from all project planning processes, integrating them into a formally approved document. A PEP includes an accurate reflection of how the project is to be accomplished, resource requirements, technical considerations, risk management, configuration management, and roles and responsibilities. (1)
Office of Project Management Oversight and Assessments (PM)	DOE organization defined responsibilities in Order 413.3B, one of which is EVMS compliance. (1)
Project Manager (PM)	The person assigned by the performing organization to achieve the project objectives. (1)
Performance Measurement Baseline (PMB)	A time-phased resourced plan against which the accomplishment of authorized work can be measured. (1)
Performance Work Statement (PWS)	A statement of work for performance-based acquisitions that describes the required results in clear, specific and objective terms with measurable outcomes. (Derived from FAR Subpart 37.6)
Planning Package (PP)	A segmented portion of discrete program scope within a Control Account that is not yet broken down into work packages but is logically linked in the IMS - performance cannot be taken against a Planning Package. (NDIA IPMD PASEG v3)
P6	Abbreviation for Primavera software schedule tool. (www.oracle.com)
Quantifiable Backup Data (QBD)	This is also sometimes referred to as “Predetermined Rationale” or “Rules of Performance”, and essentially requires the establishment of lower level milestones, activities, or steps to determine the percent complete. These steps are established and weighted prior to beginning the effort. (1)
Qualifying Expectations (QE)	Formally known as qualifying expectations lines of inquiry (QE LOI). In this document they define the minimum expectations to meet the requirement of the EIA-748 guideline. All corrective action requests (CARs) will be referenced against an individual LOI. (1)
Responsibility Assignment Matrix (RAM)	A chart showing the relationship between the Contract Work Breakdown Structure elements and the organizations assigned responsibility for ensuring their accomplishment. The RAM depicts the assignment of each control account to a single manager. When resource values are applied to these relationships, it may be referred to as a dollarized RAM. (2)

System Description (SD)	The set or series of integrated process descriptions/procedures that describe a contractor's Earned Value Management System. (2)
Schedule Margin (SM)	An optional technique used for insight and management of schedule risks. A SM task is an un-resourced activity that is the Program Manager's assessment of the amount of schedule risk to a subsequent significant event. (NDIA IPMD PASEG v3)
Start-to-Finish (SF)	A logical relationship used in the IMS network that establishes the following rule between two activities: the succeeding task cannot finish until a preceding task starts (rarely used). (NDIA IPMD PASEG v3)
Summary Level Planning Package (SLPP)	An aggregation of work for far-term efforts which can be assigned to reporting level WBS elements but not to the control account level and are therefore not "undistributed budget". (1)
Statement of Work (SOW)	A narrative description of contracted products or services. (1)
Start-to-Start (SS)	A logical relationship used in the IMS network that establishes the following rule between two activities: the succeeding task cannot start until a preceding task starts. (NDIA IPMD PASEG v3)
Schedule Visibility Task (SVT)	Tasks, activities or milestones in the Integrated Master Schedule (IMS) that increase management visibility and functionality of the schedule for non-Performance Measurement Baseline related items. SVTs are included in the IMS to characterize potential impacts to the logic-driven network. (2)
Total Allocated Budget (TAB)	The sum of all budgets allocated to the contract for the project. The TAB is equal to the Contract Budget Base (Performance Measurement Baseline plus Management Reserve) unless an over target baseline (OTB) has been implemented. After an OTB, the revised TAB=CBB + the over target budget. See Figures 3-4A–4E and 3-14. (1)
Total Project Costs (TPC)	All costs between CD-0 and CD-4 specific to a project incurred through the startup of a facility, but prior to the operation of the facility. Applicable costs to achieve CD-0 may also be included. Thus, TPC includes the total estimated cost and fee for all contracts included in the project and may include Government prime contracts for external independent review, technical support services, and other prime Government contracts for components of the projects. TPC is the summation of TEC plus OPC, as well as the summation of the PMB + MR + contingency + profit/fee + other DOE costs. (1)
Undistributed Budget (UB)	A temporary holding account for authorized scope of work and its budget that has not been assigned to a control account or summary level planning package or for scope coming off of a contract. This is a part of the PMB and is contractor controlled. (1)

Variance Analysis Reports (VAR)	A document that includes specific information about the cause, impact, and corrective action "provides management with early insight into the extent of problems and allows corrective actions to be implemented in time to affect the future course of the program". (https://blog.humphreys-assoc.com/evms-variance-analysis-reports/)
Variance at Complete (VAC)	The difference between the budget at completion and the estimate at completion is VAC = BAC - EAC. (Source: DOE Guide 413.3-10A DOE EVM Gold Card). It may be calculated at any level from the control account up to the total contract. It represents the amount of expected overrun (negative VAC) or underrun (positive VAC). (1)
Vertical Integration	Demonstrates the consistency of data between the various levels of schedules and consistency of data between various Work Breakdown Structure elements and/or Integrated Master Plan/Integrated Master Schedule elements (if applicable) within the schedules. (2)
Work Authorization Document (WAD)	A contractor's internal process for authorizing the commencement of program work. All work within a program is described in terms of work scope, budget and schedule and authorized through the work authorization system. (2)
Work Breakdown Structure (WBS)	Used by the project management team to organize and define a project into manageable objectives and create a blueprint by which the steps leading to the completion of a project are obtained. It is a product-oriented family tree composed of hardware, software, services, data and facilities and other project-unique tasks which serves as an outline of the project that becomes more detailed under the subheadings or WPs (1)
Work Breakdown Structure Dictionary	A two-part document containing: 1) a listing of all WBS elements, and 2) the defined scope of each element. Work that is included, as well as closely related work that is excluded is normally contained in the definition of each WBS element. With EVM the Dictionary may be extended to the Control Account Level or one level above. (1)
Work Package (WP)	A WP contains a task or set of tasks performed within a control account, and is the point at which work is planned, progress is measured, and earned value is computed. (1)
Sources	(1) DOE PM Glossary of Terms Handbook (current version)
	(2) DOD EVMS Interpretation Guide 2/18/15
	Others as specified

APPENDIX C – REFERENCES

- Department of Defense. DOD Earned Value Management System Interpretation Guide 02-18-2015. http://www.acq.osd.mil/evm/docs/DoD%20EVMSIG.pdf
- Department of Energy Acquisition and Project Management Glossary of Terms Handbook. September 5, 2014. http://energy.gov/management/downloads/doe-acquisition-and-project-management-apm-glossary-terms-handbook-final
- Department of Energy Integrated Program Management Report (IPMR) Data Item Description (DID). http://www.energy.gov/projectmanagement/downloads/integrated-program-management-report-ipmr-data-item-description-did
- Department of Energy, Program and Project Management for the Acquisition of Capital Assets, DOE O 413.3B, Washington, DC: 11-29-2010.
- Electronic Industries Alliance (EIA) 748-C http://webstore.ansi.org/FindStandards.aspx?SearchString=Earned+Value&SearchOption=1&PageNum=0&SearchTermsArray=Earned+Value%7Cnull%7Cnull
- Federal Acquisition Regulation (FAR) Subpart 34.2, and Part 52. http://farsite.hill.af.mil/
- National Defense Industry Association (NDIA) Integrated Program Management Division (IPMD) Planning and Scheduling Excellence Guide (PASEG) v3, 3/9/2016
- OMB Circular A-11, Part 7, Capital Programming Guide http://www.whitehouse.gov/omb/circulars_a11_current_year_a11_toc
- Contract Performance Report (CPR) Data Item Description (DID) (DI-MGMT-81466A)
- Integrated Program Management Report (IPMR) Data Item Description (DID) (DI-MGMT-81861) http://energy.gov/projectmanagement/downloads/integrated-program-management-report-ipmr-data-item-description-did

APPENDIX D – TABLE OF QE LOIs (Numerical Order)

1.A.1	IS A SINGLE PRODUCT-ORIENTED WBS USED FOR A GIVEN PROJECT EXTENDED TO THE CONTROL ACCOUNT LEVEL AS A MINIMUM?
1.A.2	DOES THE WBS INCLUDE ALL AUTHORIZED PROJECT WORK INCLUDING THE IDENTIFICATION OF WORK SCOPE TO BE PERFORMED BY SUBCONTRACTORS AND ANY REVISIONS RESULTING FROM AUTHORIZED CHANGES AND MODIFICATIONS?
2.A.1	DOES A SINGLE OBS EXIST THAT CONTAINS ALL OF THE RESPONSIBLE ORGANIZATIONAL ELEMENTS NECESSARY TO EXECUTE THE PROJECT TO INCLUDE MAJOR SUBCONTRACTED AND INTER- ORGANIZATIONAL WORK?
3.A.1	ARE THE PLANNING, SCHEDULING, BUDGETING, WORK AUTHORIZATION AND COST ACCUMULATION SYSTEMS INTEGRATED WITH EACH OTHER VIA A COMMON CODING STRUCTURE AND AS APPROPRIATE WITH THE WORK BREAKDOWN STRUCTURE (WBS) AND THE ORGANIZATIONAL BREAKDOWN STRUCTURE (OBS) AT THE CONTROL ACCOUNT LEVEL (AT A MINIMUM) THROUGH THE TOTAL PROJECT LEVEL?
3.A.2	WHERE AN EIA-748 EVMS FLOW DOWN IS REQUIRED, IS SUBCONTRACTOR EVMS DATA RECONCILABLE WITH THE PRIME CONTRACTOR EVMS DATA, WITH ANY DIFFERENCES EXPLAINED IN THE IPMR/CPR FORMAT 5?
4.A.1	DOES A DISCLOSURE STATEMENT OR OTHER DOCUMENT DEFINE THE INDIRECT COST STRUCTURE, BURDEN BASE AND THE TYPE OF COST INCLUDING THE ELEMENTS OF COST CONTAINED IN EACH DEFINED RATE?
4.A.2	IS THERE A PROCESS THAT CLEARLY REFLECTS HOW INDIRECT COST RESPONSIBILITY IS ESTABLISHED, BUDGETS ARE DEVELOPED, AUTHORITY IS CONTROLLED FOR EXPENDITURES, THRESHOLDS ARE PUBLISHED, EXPENSES ARE CONTROLLED, AND VARIANCE ANALYSIS IS PERFORMED AS NECESSARY?
4.A.3	IS THE LEVEL OF INDIRECT COST ALLOCATION AND MANAGEMENT WITHIN THE PROJECT DEFINED IN THE CONTRACTOR'S SYSTEM DESCRIPTION OR DETAILED INDIRECT PROCEDURES?
5.A.1	IS EACH CONTROL ACCOUNT ASSIGNED TO AN ORGANIZATIONAL ELEMENT DIRECTLY RESPONSIBLE FOR THE WORK AND IDENTIFIABLE TO A SINGLE ELEMENT OF THE WBS?
5.A.2	IS THERE ONLY ONE CAM ASSIGNED TO EACH CONTROL ACCOUNT?
5.A.3	DOES THE CAM HAVE RESPONSIBILITY, AUTHORITY, AND ACCOUNTABILITY FOR THE WORK SCOPE AND PERFORMANCE OF THE CONTROL ACCOUNT?
5.A.4	HAS THE PRIME CONTRACTOR CAM REVIEWED AND APPROVED THE SUBCONTRACTOR'S EVMS STATUS AND IS IT ACCURATELY REFLECTED IN THE PRIME'S EVMS?
5.A.5	ARE CONTROL ACCOUNTS ESTABLISHED AT APPROPRIATE LEVELS BASED ON THE COMPLEXITY OF THE WORK AND THE CONTROL AND ANALYSIS NEEDED TO MANAGE THE WORK EFFECTIVELY?
6.A.1	DOES THE IMS REFLECT ALL AUTHORIZED, TIME-PHASED DISCRETE WORK TO BE ACCOMPLISHED, INCLUDING DETAILS FOR ANY SIGNIFICANT SUBCONTRACTED EFFORT AND HIGH DOLLAR VALUE (HDV) / CRITICAL MATERIALS?

6.A.2	DOES THE IMS CONTAIN PROJECT MILESTONES, PROJECT EVENTS, KEY PROJECT DECISION POINTS AND EXTERNAL DEPENDENCIES THAT ARE LOGICALLY LINKED WITHIN THE NETWORK SCHEDULE/IMS TO SUPPORT CRITICAL PATH ANALYSIS?
6.A.3	IS SCHEDULE MARGIN (IF ANY) IDENTIFIED, LOGICALLY PLANNED, AND IN THE BASELINE AND FORECAST IMS?
6.A.4	ARE SIGNIFICANT AND PROBABLE RISK MITIGATION STEPS INCLUDED IN THE PRIME'S BASELINE AND FORECAST SCHEDULE AND DO THESE STEPS ALIGN WITH DEFINED MITIGATION ACTIVITIES IN THE RISK REGISTRY?
6.A.5	DOES THE CONTRACTOR MAINTAIN AN IMS DATADICTIONARY?
6.B.1	DOES THE NETWORK SCHEDULE/IMS DESCRIBE THE SEQUENCE OF WORK (HORIZONTAL INTEGRATION) AND CLEARLY IDENTIFY SIGNIFICANT INTERDEPENDENCIES THAT ARE INDICATIVE OF THE ACTUAL WAY THE WORK IS PLANNED AND ACCOMPLISHED AT THE LEVEL OF DETAIL TO SUPPORT PROJECT CRITICAL PATH DEVELOPMENT?
6.B.2	IS THERE VERTICAL SCHEDULE INTEGRATION, (I.E., CONSISTENCY OF DATA BETWEEN VARIOUS LEVELS OF SCHEDULES (INCLUDING SUBCONTRACTOR AND FIELD LEVEL SCHEDULES) AND DO ALL LEVELS OF SCHEDULES SUPPORT THE PROJECT SCHEDULE REQUIREMENTS?
6.B.3	ARE LEADS AND LAGS MINIMIZED AND JUSTIFIED IF EXCESSIVE?
6.B.4	DOES THE IMS MINIMIZE THE USE OF CONSTRAINTS?
6.B.5	IS THE SCHEDULE BROKEN INTO SHORT BASELINED DISCRETE ACTIVITIES IN THE DETAILED PLANNING PERIOD?
6.B.6	HAS A PLANNING HORIZON METHODOLOGY BEEN IMPLEMENTED WITHIN THE PRIOR 12 MONTHS OR TO THE NEXT MAJOR PROJECT TECHNICAL MILESTONE OR CRITICAL DECISION GATE?
6.C.1	IF LOE ACTIVITIES ARE INCLUDED IN THE IMS, DOES THE CONTRACTOR ASSURE THEY DO NOT DRIVE, OR ARE DRIVEN BY THE DISCRETE WORK?
6.C.2	IS THE IMS TOTAL FLOAT REASONABLE FOR THE APPROVED SCOPE OF WORK?
6.C.3	DOES THE CURRENT SCHEDULE PROVIDE ACTUAL STATUS INCLUDING START AND COMPLETION DATES CONSISTENT WITH THE MONTH END STATUS (DATA) DATE FOR ALL DISCRETE AUTHORIZED WORK?
6.C.4	ARE THE WORKAROUND PLANS REFLECTED IN THE FORECAST SCHEDULE, PLANNED IN SUCH A MANNER TO SUPPORT A REALISTIC CRITICAL PATH WITH THE FORECAST LOGICALLY REVIEWED, WITH CONCURRENCE BY CAMs, OTHER AFFECTED ORGANIZATIONS?
6.C.5	ARE BASELINE CHANGES TRACKED AND TRACEABILITY DEMONSTRATED?
6.C.6	ARE RESOURCE AVAILABILITY AND CONSTRAINTS USED IN THE DEVELOPMENT OF DURATIONS FOR ACTIVITIES, WP, PP/SLPP?
7.A.1	ARE MILESTONES, TECHNICAL PERFORMANCE GOALS, OR OTHER INDICATORS USED AS INDICATORS OF PROGRESS?
8.A.1	ARE ALL OF THE ELEMENTS OF THE PMB (SCOPE, SCHEDULE, AND BUDGET) ALIGNED?
8.A.2	DOES THE PMB PLUS MR EQUAL THE CONTRACT BUDGET BASE? (IF AN OVER TARGET BASELINE IS IN PLACE DOES THE NEW PMB PLUS MR EQUAL THE TOTAL ALLOCATED BUDGET)?

8.A.3	DOES THE CBB RECONCILE WITH THE TOTAL PROJECT COST (TPC) AS APPLICABLE?
8.A.4	ARE CONTROL ACCOUNTS AND WPs OPENED AND CLOSED IN A TIMELY MANNER CONSISTENT WITH THE ACTUAL START AND COMPLETION AS STATUSED IN THE IMS?
8.A.5	IF AN OTB/OTS HAS BEEN APPROVED AND IMPLEMENTED, HAS THE WORK AUTHORIZATION DOCUMENTS BEEN MODIFIED TO REFLECT THE OTB/OTS VALUES?
8.B.1	DO ALL SLPPs, IF ANY, HAVE SCOPE, SCHEDULE, AND BUDGET DEFINED?
9.A.1	DO WORK AUTHORIZATION DOCUMENTS IDENTIFY SCOPE OF WORK, BUDGET BY ELEMENT OF COST, AND PERIOD OF PERFORMANCE?
9.A.2	ARE WORK AUTHORIZATION DOCUMENTS CONSISTENT WITH THE OBS LEVELS OF RESPONSIBILITY?
9.A.3	DOES THE CONTRACTOR REQUIRE THAT WORK SCOPE, SCHEDULE, AND BUDGET ARE AUTHORIZED BEFORE THE WORK IS ALLOWED TO BEGIN AND ACTUAL COSTS ARE INCURRED?
9.B.1	WITHIN CONTROL ACCOUNTS, ARE BUDGETS SEGREGATED AND PLANNED BY ELEMENT OF COST (E.G., LABOR, MATERIAL, SUBCONTRACT, AND OTHER DIRECT COSTS)?
9.C.1	ARE BUDGETS AT THE WP LEVEL IN DOLLARS? IF NOT, ARE THEY CONVERTED TO DOLLARS FOR ROLLUP AND REPORTING PURPOSES?
10.A.1	DO DISCRETE WPs HAVE DURATIONS LIMITED TO A RELATIVELY SHORT SPAN OF TIME THAT IS PRACTICAL AND APPROPRIATE FOR THE WORK SCOPE? IF NOT, ARE THESE WPs SUPPORTED BY OBJECTIVE INTERIM MEASURES SUCH AS POINTS OF TECHNICAL ACHIEVEMENT TO ENABLE ACCURATE PERFORMANCE ASSESSMENT?
10.A.2	ARE WPs DEFINED AT THE LEVEL WHERE THE WORK IS PERFORMED, AND IS EACH WP ASSIGNED TO AN ORGANIZATION?
10.A.3	DOES THE SUMMATION OF A CONTROL ACCOUNT′S WPs AND PLANNING PACKAGES REPRESENT THE TOTAL SCOPE OF THE CONTROL ACCOUNT?
10.A.4	ARE BUDGETS OR VALUES ASSIGNED TO WORK PACKAGES AND PLANNING PACKAGES IN TERMS OF DOLLARS, HOURS, OR OTHER MEASURABLE UNITS THAT ARE CONSISTENT WITH PROJECT REQUIREMENTS?
10.A.5	ARE WP AND PLANNING PACKAGE BUDGETS TRACEABLE TO THE BASIS OF ESTIMATE (COST ESTIMATE), AS MODIFIED BY PROJECT DEFINITIZATION, PROJECT CHANGES, OR APPROVED BASELINE CHANGES?
10.A.6	ARE WPs ASSIGNED EVTs IN ACCORDANCE WITH THE SYSTEM DESCRIPTION AND CONSISTENT WITH THE NATURE OF THE PLANNED WORK?
10.A.7	ARE WP EXIT OR COMPLETION CRITERIA DEFINED?
10.A.8	ARE WPs CLEARLY DISTINGUISHABLE FROM ALL OTHER WPs INCLUDING THE TITLES BEING UNIQUE AND CONSISTENT WITH THE SCOPE OF THE WP?
10.A.9	ARE THE EVTS FOR MATERIAL CONSISTENT WITH THE MANNER IN WHICH MATERIAL IS PLANNED?
10.A.10	DO SLPPs AND PLANNING PACKAGES HAVE SCOPE, SCHEDULE, AND BUDGET DEFINED BY EOC?
10.A.11	DO WORK PACKAGE EVTS RESULT IN THE ABILITY TO CLAIM PROGRESS IN ALL MONTHS IN WHICH RESOURCES ARE SCHEDULED

	AT THE TIME THE WORK PACKAGE IS BASELINED, AND BASED ON OBJECTIVE INDICATORS AS APPROPRIATE?
10.A.12	IS DISCRETE PERFORMANCE DETERMINED IN THE IMS IDENTICAL TO THAT REPRESENTED IN THE EVM COST TOOL?
10.B.1	IS THE PERCENT COMPLETE EARNED VALUE TECHNIQUE (EVT) APPLIED AT THE LEVEL AT WHICH PERFORMANCE IS ASSESSED, SUPPORTED BY QUANTIFIABLE BACKUP DOCUMENTATION (QBD) IF LONGER THAN 44 WORKING DAYS?
10.B.2	IS ANY WORK CLASSIFIED AS APPORTIONED EFFORT EVT PROPERLY CLASSIFIED, AND DIRECTLY PROPORTIONAL TO OTHER DISCRETE TASK(S)?
11.A.1	DO THE SUM OF ALL WORK PACKAGE BUDGETS PLUS PLANNING PACKAGE BUDGETS WITHIN CONTROL ACCOUNTS EQUAL THE BUDGETS AUTHORIZED FOR THOSE CONTROL ACCOUNTS?
12.A.1	IS THE LOE EV TECHNIQUE ONLY USED FOR EFFORT WHERE MEASUREMENT IS IMPRACTICAL OR WORK THAT DOES NOT PRODUCE A DEFINABLE END PRODUCT?
12.A.2	IS THE CO-MINGLING OF LOE AND DISCRETE EFFORT WITHIN A CONTROL ACCOUNT MINIMIZED TO ENSURE VISIBILITY OF THE PERFORMANCE MEASUREMENT OF THE DISCRETE EFFORT?
13.A.1	ARE INDIRECT BUDGETS ESTABLISHED AND PROJECTED, ANNUALLY AT A MINIMUM, FOR EACH ORGANIZATION WHICH HAS AUTHORITY TO INCUR INDIRECT COSTS?
13.A.2	ARE INDIRECT BUDGETS INCORPORATED INTO THE PMB IN CONCERT WITH DOCUMENTED PROCESSES AND CURRENT RATES (I.E., APPROVED, PROVISIONAL, PROPOSED)?
14.A.1	DOES MR BUDGET HAVE NO SCOPE DEFINED AND IS IT HELD OUTSIDE THE PMB AND CONTROLLED BY THE CONTRACTOR?
14.A.2	ARE CONTINGENCY BUDGETS, IF ANY, HELD OUTSIDE THE CBB?
14.A.3	IS MR CORRECTLY DEFINED IN THE SYSTEM DESCRIPTION AND ARE ALLOWABLE APPLICATIONS OF MR LISTED/DEFINED?
14.B.1	DOES UB HAVE DEFINED SCOPE THAT IS SEPARATELY IDENTIFIED BY CHANGE AUTHORIZATION, TRACEABLE TO CONTRACTUAL ACTIONS AND IS IT PART OF THE PMB?
14.B.2	AS A MINIMUM, IS AT LEAST THE NEAR-TERM PORTION OF AUTHORIZED UNPRICED WORK (AUW) DETAILED PLANNED IN CONTROL ACCOUNTS WITH THE REMAINDER CONTAINED IN UB?
15.A.1	DOES THE TPC EQUAL CBB + OTB + FEE + ODC + DOE CONTINGENCY AS APPLICABLE?
15.A.2	IS THERE A RECONCILIATION OF THE TAB TO THE CBB?
16.A.1	IS THE ACTUAL COST OF WORK PERFORMED (ACWP) IN THE EVM COST TOOL FORMALLY RECONCILED EACH MONTH WITH THE ACTUAL COSTS IN THE ACCOUNTING SYSTEM?
16.A.2	IS THE MANNER IN WHICH THE CONTRACTOR CLASSIFIES ITS DIRECT COST (DIRECT LABOR, MATERIAL, AND OTHER DIRECT COSTS) AND CREDITS CONSISTENT WITH THEIR APPROVED DISCLOSURE STATEMENT?
16.A.3	IS ACWP RECORDED IN THE SAME MONTH THAT BCWP IS CLAIMED (FOR ALL ELEMENTS OF COST)?
16.A.4	ARE DIRECT COSTS RECORDED IN THE CONTROL ACCOUNT ON THE SAME BASIS AS BUDGETS WERE ESTABLISHED AND, AT A MINIMUM, BY ELEMENT OF COST (EOC)?
16.A.5	ARE ACWP VALUES IN THE EVM COST TOOL RECONCILABLE TO THE IPMR/CPR AS APPLICABLE?

16.A.6	ARE NEGATIVE ACWP VALUES (IF ANY) INFREQUENT, JUSTIFIED, APPROVED, AND ARE SIGNIFICANT ADJUSTMENTS TO ACWP ADDRESSED IN FORMAT 5 OF THE IPMR/CPR?
16.A.7	ARE ESTIMATED ACTUAL COSTS (ACCRUALS) REVERSED TO AVOID DOUBLE COUNTING?
16.B.1	FOR MATERIAL PROCUREMENTS, DOES THE SYSTEM PROVIDE COMMITMENT, RECEIPTS AND, IF APPLICABLE, USAGE?
16.B.2	DOES THE CONTRACTOR ACCRUE ACTUAL COSTS FOR THE SUBCONTRACTOR IN A MANNER THAT REFLECTS THE ACTUAL WORK PERFORMANCE?
16.B.3	ARE ACCOUNTS PAYABLE RECONCILABLE OR USED AS A SOURCE FOR ESTIMATED ACTUALS?
16.B.4	ARE ANOMALIES IN ACTUAL COST (INCORRECT CHARGES, TRANSFERS, ETC.) THAT ARE IDENTIFIED BY THE CAM, CORRECTED IN A TIMELY MANNER?
17.A.1	CAN DIRECT COSTS BE SUMMARIZED BY ELEMENT OF COST, FROM THE WP/CHARGE NUMBER LEVEL THROUGH THE WBS HIERARCHY?
17.A.2	DOES THE CONTRACTOR DOCUMENT THE RELATIONSHIPS, IF ANY, BETWEEN SCHEDULE ACTIVITIES, CHARGE NUMBER (ACCOUNTS), WPs AND CONTROL ACCOUNTS?
18.A.1	CAN DIRECT COSTS BE SUMMARIZED BY ELEMENT OF COST, FROM THE CHARGE NUMBER LEVEL THROUGH THE OBS HIERARCHY?
18.A.2	DOES THE CONTRACTOR′S SYSTEM PROHIBIT ALLOCATION OF DIRECT COSTS TO TWO OR MORE HIGHER LEVEL OBS ELEMENTS?
19.A.1	ARE INDIRECT COSTS CHARGED TO THE APPROPRIATE INDIRECT POOLS?
19.A.2	ARE THE INDIRECT RATE ADJUSTMENTS APPLIED CONSISTENTLY AMONG ALL APPLICABLE PROJECTS?
20.A.1	DOES THE CONTRACTOR′S SYSTEM HAVE THE CAPABILITY TO PROVIDE UNIT COSTS, EQUIVALENT UNIT OR LOT COSTS IN TERMS OF LABOR, MATERIAL, OTHER DIRECT, AND INDIRECT COSTS AS REQUIRED BY THE PROJECT?
20.A.2	CAN RECURRING OR NONRECURRING COSTS BE IDENTIFIED AS NECESSARY OR WHEN REQUIRED BY THE CONTRACT?
21.A.1	ARE MATERIAL ACTUAL COSTS RECORDED ON THE SAME BASIS IN WHICH BUDGETS WERE PLANNED AT THE CA LEVEL?
21.A.2	IS HDV MATERIAL PERFORMANCE (BCWP) RECORDED IN ONE OF THE FOLLOWING WAYS: 1) UPON RECEIPT OF MATERIAL BUT NOT EARLIER, 2) ISSUE FROM INVENTORY, OR 3) CONSUMPTION OF THE MATERIAL?
21.A.3	DOES THE MATERIAL OR OTHER SYSTEM PROVIDE FOR THE ACCOUNTABILITY FOR MATERIAL PURCHASED FOR THE PROJECT?
21.A.4	DOES THE MATERIAL SYSTEM ADDRESS THE VARIOUS METHODS OF CHARGING MATERIAL COSTS FROM INVENTORY, IN ACCORDANCE WITH THE CONTRACTOR′S PROCEDURES?
21.A.5	DOES THE CAM ADDRESS PRICE/USAGE ANALYSIS ON HDV MATERIAL?
22.A.1	IS INFORMATION GENERATED ON A MONTHLY BASIS AT A CONTROL ACCOUNT LEVEL (AT A MINIMUM), AND DOES IT INCLUDE SCHEDULE VARIANCE, COST VARIANCE, AND VARIANCE AT COMPLETION?
22.A.2	ARE THE FORMULAS TO CALCULATE SV, CV, AND VAC CONSISTENT WITH CPR/IPMR INSTRUCTIONS?
22.A.3	IS THE MEASUREMENT OF COST AND SCHEDULE PERFORMANCE CONSISTENTLY APPLIED THROUGHOUT THE PROJECT?

22.A.4	DOES THE CONTRACTOR PERFORM ANALYSIS AT THE LOWEST LEVEL WHERE BCWS IS PLANNED, BCWP IS EARNED, AND ACWP IS COLLECTED?
22.A.5	ARE BCWP CALCULATIONS CONSISTENT WITH THE MANNER IN WHICH THE WORK IS PLANNED?
22.A.6	FOR SUBCONTRACTORS WITHOUT AN EIA-748 EVMS FLOW DOWN REQUIREMENT, DOES THE PRIME CONTRACTOR ASSESS SUBCONTRACTOR PERFORMANCE BASED ON A PLAN CONTAINING OBJECTIVE INDICATORS FOR MEASURING SUBCONTRACTOR PERFORMANCE?
22.A.7	ARE VARIANCE THRESHOLDS IDENTIFIED AND DOCUMENTED IN THE EVM PROCEDURES?
22.A.8	DO CAMs DEVELOP VARIANCE ANALYSIS AND OBTAIN THE APPROPRIATE MANAGEMENT APPROVALS?
23.A.1	ARE ALL SIGNIFICANT COST, SCHEDULE, AND TECHNICAL IMPACTS TO THE CONTROL ACCOUNT WITH REGARD TO THE CONTRACTOR'S INTERNAL THRESHOLDS DISCUSSED AND DOCUMENTED MONTHLY? ARE VARIANCES ADDRESSED IN THE DETAIL NEEDED BY PROJECT MANAGEMENT?
23.A.2	FOR SUBCONTRACTS WITH AN EIA-748 EVMS FLOW DOWN, IS THE PRIME'S VARIANCE ANALYSIS FOR MAJOR SUBCONTRACTORS CONSISTENT WITH ITS DOCUMENTED EVMS PRACTICE?
24.A.1	ARE THERE VARIANCE THRESHOLDS ESTABLISHED FOR INDIRECT POOL VARIANCE ANALYSIS AND REPORTING?
24.A.2	ARE THE RESULTS OF INDIRECT VARIANCE ANALYSIS PROVIDED TO THE APPROPRIATE LEVEL OF PROJECT MANAGEMENT ON A ROUTINE BASIS?
25.A.1	IS PERFORMANCE MEASUREMENT INFORMATION SUMMARIZED FROM THE CONTROL ACCOUNT TO THE PROJECT LEVEL THROUGH THE WBS AND OBS FOR PROJECT MANAGEMENT ANALYSIS PURPOSES?
26.A.1	IS THERE EVIDENCE THE CONTRACTOR'S MANAGEMENT USES AND ANALYZES EARNED VALUE INFORMATION (AT LEAST ON A MONTHLY BASIS) AS A PART OF THEIR DECISION-MAKING?
26.A.2	DO CORRECTIVE ACTIONS IDENTIFY RISK MITIGATION STEPS, INCLUDING ACTIVITIES TO REDUCE COST/SCHEDULE IMPACTS TO THE PMB. DO THE CORRECTIVE ACTIONS INCLUDE A COMPLETION SCHEDULE AND THE IDENTIFICATION OF PERSON(S) RESPONSIBLE FOR EXECUTING THE CORRECTIVE ACTION PLANS?
26.A.3	ARE CORRECTIVE ACTION PLANS THAT ARE GENERATED THROUGH THE VARIANCE ANALYSIS PROCESS TRACKED TO THEIR RESOLUTION AND CLOSURE?
26.A.4	DOES THE PRIME CONTRACTOR MONITOR SUBCONTRACTOR CORRECTIVE ACTION(S) THROUGH CLOSURE?
26.A.5	ARE SIGNIFICANT CHANGES IN FLOAT VALUES REVIEWED BY MANAGEMENT?
27.A.1	DOES THE CONTRACTOR REQUIRE MONTHLY AND COMPREHENSIVE EACs WITHIN CONTROL ACCOUNTS AT THE LEVEL WHERE RESOURCES ARE PLANNED?
27.A.2	DO THE CONTRACTOR'S EXTERNALLY REPORTED EACS AND THE INTERNALLY GENERATED EACS FROM A SUMMARIZATION OF THE CA EACS RECONCILE?
27.A.3	ARE ETCS BASED ON TIME-PHASED RESOURCE PLANS THAT ARE CONSISTENT WITH SCHEDULE FORECAST DATES?

27.A.4	IS AN EVALUATION OF ALL SUBCONTRACTED EFFORT INCLUDED IN THE EAC?
27.B.1	ARE CONTROL ACCOUNT EACS MAINTAINED AND UPDATED PROMPTLY BASED ON EOC LEVEL PERFORMANCE IMPACTS TO THE PROJECT, SCOPE CHANGES, SCHEDULE TECHNICAL PERFORMANCE AND SCHEDULE/COST IMPACTS?
27.C.1	DOES THE ANNUAL COMPREHENSIVE EACS CONSIDER RISK, FUNDING, AND ALL PROJECT COSTS BY EOC AND IS IT CONDUCTED IN ACCORDANCE WITH THE DOCUMENTED EVM PROCESS?
28.A.1	ARE AUTHORIZED CHANGES INCORPORATED IN THE CBB, PMB AND THE IMS NO LATER THAN ONE FULL ACCOUNTING PERIOD FOLLOWING THE CONTRACTOR BASELINE CHANGE DOCUMENTATION APPROVAL?
28.A.2	IS UB DISTRIBUTED TO OR REMOVED FROM CONTROL ACCOUNTS OR SUMMARY LEVEL PLANNING PACKAGES AS SOON AS PRACTICABLE, BUT NOT LATER THAN TWO ACCOUNTING PERIODS AFTER THE DOE APPROVED CHANGE DOCUMENT?
28.A.3	DOES THE CONTRACTOR INCORPORATE AUTHORIZED CHANGES INTO THE WBS DICTIONARY, IMS, EVMS COST TOOL, CBB LOG, AND WORK AUTHORIZATION WITHIN THE SAME ACCOUNTING PERIOD?
28.B.1	IS AUW INCORPORATED INTO THE PMB AT THE ESTIMATED VALUE OF THE AUW SCOPE REGARDLESS OF ANY “NOT TO EXCEED” (NTE) SPENDING LIMITATION?
29.A.1	IS THE FREEZE PERIOD DEFINED IN THE SD AS NO LESS THAN THE CURRENT ACCOUNTING PERIOD PLUS ONE PERIOD, AND IS IT CONSISTENTLY APPLIED?
29.A.2	ARE BASELINE CHANGES AND/OR ACCOUNTING ADJUSTMENTS THAT ARE DEFINED AND IMPLEMENTED WITHIN THE FREEZE PERIOD DESCRIBED IN THE EVM SD, WITH ANY EXCEPTIONS DESIGNED TO IMPROVE THE QUALITY OF EVMS DATA?
29.A.3	DOES DOCUMENTATION FOR ANY BASELINE CHANGE INCLUDE ALL RELEVANT ITEMS THAT IMPACT THE BASELINE PLANNING?
29.B.1	ARE THE REVISED SCHEDULES AND BUDGETS RESULTING FROM AUTHORIZED BASELINE CHANGES TRACEABLE TO THE PRIOR SCHEDULES AND BUDGETS?
29.B.2	ARE INTERNAL CHANGES FULLY AUTHORIZED CONSISTENT WITH THE CONTRACTORS CHANGE CONTROL/SD PROCESS?
29.B.3	IF THE PROPOSED CHANGE INVOLVES UB, DOES THE CHANGE RECONCILE WITH THE TRANSFER TO OR FROM CAs, SLPPs, OR MR?
29.B.4	DOES THE CONTRACTOR LIMIT THE USE OF MANAGEMENT RESERVE (MR) TO USE WITHIN PROJECT SCOPE AND OUT OF SCOPE CONTROL ACCOUNT CHANGES; INDIRECT RATE CHANGES, CHANGES TO PLANNING ASSUMPTIONS; MAKE/BUY DECISIONS, OR SUBCONTRACTOR ORIGINAL NEGOTIATIONS?
29.C.1	ARE CHANGES TO BCWS IN OPEN WPs BEYOND THE FREEZE PERIOD LIMITED TO TIME PHASING THE EXISTING BUDGET?
29.C.2	ARE OPEN LOE WORK PACKAGES WITH INSIGNIFICANT CUMULATIVE ACWP REVIEWED FOR PURPOSES OF REPLANNING TO REDUCE FALSE VARIANCES?
29.D.1	ARE ALL CHANGES DOCUMENTED IN THE CBB LOG THAT INCLUDES CA, SLPP, PP, MR, UB INFORMATION AND RECONCILED ALL CHANGES MONTH TO MONTH?
30.A.1	DOES THE CONTRACTOR LIMIT RETROACTIVE CHANGES TO ROUTINE ACCOUNTING ADJUSTMENTS, DEFINITIZATION OF CONTRACT

	ACTIONS, CUSTOMER OR MANAGEMENT DIRECTED CHANGES, OR TO IMPROVE THE BASELINE INTEGRITY AND ACCURACY OF PERFORMANCE MEASUREMENT DATA?
30.A.2	IS THE USE OF SINGLE POINT ADJUSTMENTS RESTRICTED TO THE DEVELOPMENT OF A NEW REALISTIC PMB, PERFORMED WITH CUSTOMER APPROVAL, AND IN ACCORDANCE WITH THE CONTRACTOR′S DOCUMENTED SYSTEM DESCRIPTION?
31.A.1	ARE PROJECT BUDGETS (CBB OR TAB) ONLY REVISED THROUGH PROJECT AUTHORIZATION FROM DOE?
32.A.1	ARE AUTHORIZED CHANGES TO THE PMB DOCUMENTED AND TRACEABLE THROUGHOUT THE CONTRACTOR'S EVMS?

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DEPARTMENT OF ENERGY
UNITED STATES OF AMERICA