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National Defense Industrial Association (NDIA)
Program Management Systems Committee (PMSC)
ANSI/EIA-748-A Standard for
Earned Value Management Systems
Intent Guide

January 2005 Edition

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NDIA PMSC ANSI/EIA-748-A Standard for Earned Value Management Systems Intent Guide

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1 PURPOSE AND SCOPE

This intent guide was created by the National Defense Industrial Association (NDIA) Program Management Systems Committee (PMSC) to provide additional insight into the earned value management system (EVMS) guidelines included in Section 2 of the ANSI/EIA-748-A Standard for Earned Value Management Systems.

This guide is intended for use by either the government or contractor communities whenever the use of the ANSI/EIA 748 standard is required. It is recommended for use in performing an initial compliance assessment and for performing implementation surveillance. The primary purpose of this document is to define in detail the management value and intent for each of the guidelines listed in Section 2 of the ANSI/EIA 748 standard. Each intent guideline is numbered for reference purposes. Accompanying the management value and intent definitions is a list of typical attributes and a list of objective evidence typical outputs that can be used to verify compliance with a given guideline.

Section 2 in this intent document describes the typical attributes and objective evidence that can be used to demonstrate ANSI/EIA 748 EVMS Guidelines compliance.

A contractor who needs to demonstrate that their system complies with the standard can use this intent document to develop a compliance map documenting how their business processes conform to the ANSI/EIA EVMS Guidelines. The objective of the compliance map is to demonstrate that a contractor has thought through each guideline and can describe how their business process complies with the guideline. Section 3 in this document provides an example of a process description compliance map and Appendix A provides a compliance map template that can be used to help a company develop their own compliance map.

Likewise, a customer or independent reviewer can use the intent, typical attributes, and objective evidence typical outputs described in this document as the basis for verifying compliance to the guidelines.

To use this intent guide as the basis for a compliance assessment or for verifying a business process and system documentation complies with the ANSI/EIA 748 EVMS Guidelines, the NDIA PMSC recommends that:

1. Contractor business processes and system documentation be mapped and verified against the guideline intent, typical attributes, and objective evidence typical outputs described in this document by the process owner. See Section 3 for an example.
2. The compliance assessment is verified by a party independent from the documenting party.
3. The verifying party is versed in the ANSI/EIA 748 EVMS Guidelines.
4. The customer must recognize this method as applicable for the compliance assessment verification to have meaning.

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5. Customers should consider past acceptance of compliance to the ANSI/EIA 748 EVMS Guidelines, business organization application policy, and surveillance activity in making a management decision to perform a compliance assessment.

For on-going verification of continued compliance with the ANSI/EIA 748 EVMS Guidelines, the NDIA PMSC Surveillance Guide can be used in combination with this intent guide for this purpose.

To be most effective, compliant business process and system documentation should be implemented on an organization basis instead of program by program. This can be accomplished through EVMS scalability. EVMS scalability is viewed as a spectrum employing the principles of earned value management as fundamental to all programs and the EVMS Guidelines (ANSI/EIA 748 Section 2) as applicable to large complex and/or high risk programs allowing all programs regardless of size and complexity to realize the benefits of earned value management.

For definitions of common terms used in this intent guide, see Section 2.6 in the ANSI/EIA 748 standard document.

The NDIA PMSC will review and assess the need for revisions to this guide every two years.

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2 INTENT GUIDE TO THE EVMS GUIDELINES

2.1 Organization

a)	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.

Management Value

The work breakdown structure (WBS) is used as the basic building block for the planning of all authorized work. The WBS is a product-oriented division of project tasks depicting the breakdown of work scope for work authorization, tracking, and reporting purposes that facilitates traceability and provides a control framework for management. It ensures the statement of work (SOW) is entirely captured and allows for the integration of technical, schedule, and cost information. The WBS also facilitates communications as it establishes a common frame of reference for customers, management and integrated product teams (IPT).

Intent Guideline 1

A WBS is a direct representation of the work scope in the project, documenting the hierarchy and description of the tasks to be performed and relationship to the product deliverables. The WBS breaks down all authorized work scope into appropriate elements for planning, budgeting, scheduling, cost accounting, work authorization, measuring progress, and management control. The WBS must be extended to the level necessary for management action and control based on the complexity of the work. Each item in the WBS is assigned a unique identifier. These identifiers can provide a structure for a hierarchical summation of costs and resources. A WBS dictionary defines the work scope for each element in the WBS.

Typical Attributes:

- Only one WBS is used per project and it contains all project work including revisions for authorized changes and modifications.
- WBS contains all contract line items and end items.
- WBS identifies all WBS elements specified for external reporting.
- WBS is extended at a minimum to the control account level.
- WBS elements include a complete definition of work scope requirements.
- WBS will evolve as the project requirements change.

Objective evidence may be found in these typical outputs:

- Work breakdown structure (WBS).
- WBS dictionary (may or may not be used, but a method to reconcile the statement of work to the WBS structure must be demonstrated).

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b)	Identify the program 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.

Management Value

The organization breakdown structure (OBS) is an organization framework for identification of accountability, responsibility, management, and approvals of all authorized work scope. The OBS helps management focus on establishing the most efficient organization by taking into consideration availability and capability of management and technical staff, including subcontractors, to achieve the project objectives.

Intent Guideline 2

Assign organizational responsibility for the project work. An OBS is used to facilitate the assignment of responsibility, accountability, and authority for all WBS tasks to be performed. An OBS is a direct representation of the hierarchy and description of the organizations established to provide resources to plan and perform the work tasks. The OBS identifies the organization responsible for each segment of work, including subcontracted and intra-organizational effort. The assignment of lower-level work segments to responsible managers provides a key control point for management purposes. This is called the control account (CA). When effort is subcontracted, the applicable subcontractor is identified and related to the appropriate WBS element(s) and/or organization charged with acquiring the subcontracted item.

Typical Attributes:

- All authorized work is assigned to organizational elements.
- Organization elements are work teams, functions, or whatever organization units are used by the company for efficient execution of the program work efforts.
- Major subcontractors are integrated into the program structure.

Objective evidence may be found in these typical outputs:

- Organization breakdown structure (OBS).
- OBS intersection with the WBS.

c)	Provide for the integration of the company's 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.

Management Value

The integration of planning, scheduling, budgeting, work authorization, and cost accumulation management processes provides the capability for establishing the performance measurement baseline (PMB), identifying work progress, and collection of actual costs facilitating management analysis and corrective actions. The WBS and OBS

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allow summarization of cost data from the detail level through the WBS and OBS to the appropriate project level needed for management insight and control.

Intent Guideline 3

Integrate the technical, schedule, and cost elements of the project through detailed, intermediate and summary project plans that include schedules, budgets, authorization of work, and accumulation of costs consistent with the budget plan. The work tasks are assigned to a WBS and OBS and are traceable to the scheduling system and the cost collection system. Establishment of control accounts at the intersection of the WBS and OBS facilitates the linkage between the planning, scheduling, budgeting, work authorization, cost accumulation, and performance measurement processes. The control accounts should be determined by the scope of the management tasks.

Typical Attributes

Provide a logical framework that links the products of the management processes through common data elements. For example a cross-reference between the statement of work and the WBS, schedules tasks and performance measurement tasks, detail schedules and control account plans.

Objective evidence may be found in these typical outputs:

- Master, intermediate, and detail level schedules.
- Manufacturing requirements planning (MRP) or enterprise requirements planning (ERP) operational schedules.
- Control account plans.
- Performance reports by WBS and OBS.
- Responsibility assignment matrix (RAM).
- Statement of work.
- Work authorization.
- WBS and OBS.

d)	Identify the company organization or function responsible for controlling overhead (indirect costs).

Management Value

Visibility into direct and indirect costs is essential for successful management of a project. Therefore, it is important to have a documented process and organizations established specifically to manage and control indirect costs. 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 organization manager level.

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Intent Guideline 4

Clearly identify managers who are assigned responsibility and authority for controlling indirect costs including overhead, burden, and general administrative (G&A) costs, and have the authority to approve expenditure of resources. Document the process for management and control of indirect costs.

Typical Attributes:

- Indirect account structure and organizational assignment/authority level are clearly defined.
- Documented process clearly defines:
  - How overhead resources are assigned, budgets are established, and expense is controlled;
  - Who is responsible within the organization for establishing overhead budgets and their authorities.

Objective evidence may be found in these typical outputs:

- Cost accounting standards (CAS) disclosure statement.
- Organizational chart.
- Chart of accounts.

e)	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.

Management Value

Integration of the WBS and OBS establishes the control account where the performance measurement necessary for project management is performed. This intersection results in designation of a focal point for management control, the control account manager (CAM).

Intent Guideline 5

Integrate the WBS and OBS to facilitate schedule and cost performance measurement.

The control account is the point where the WBS tasks and OBS responsibility intersect. It is defined as the point where a single functional organization or integrated product team has responsibility for work defined to a single WBS element. It is also the initiation point for work authorization, performance management, and performance measurement. The control account identifies the plan for work task accomplishment, includes a definition of the effort required, identifies element of cost (labor, material, etc.) and identifies the resources required to do the job. Each control account is assigned a control account manager. The control account manager is responsible for ensuring the accomplishment of work in his or her control account and is the focal point for management control.

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Typical Attributes:

- Single control account is visible at the intersection of the WBS and OBS.
- Control account clearly identifies any supporting activities.
- The performance elements of cost are evident.

Objective evidence may be found in these typical outputs:

- Control accounts.
- Responsibility assignment matrix (RAM).

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2.2 Planning, Scheduling, and Budgeting

a)	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.

Management Value

Scheduling authorized work facilitates effective planning, statusing, and forecasting which is critical to the success of all projects. The integration of the technical, schedule, and cost aspects of the project results in the expected sequence of work, and through the creation of relationships among tasks, significant interdependencies are established that determine total work time and related longest path through the project. The longest path (typically called the critical path) represents the shortest project duration.

Intent Guideline 6

The scheduling process documents and the resulting project schedule provides a logical sequence of work leading to a milestone, event, and/or decision point, to ensure that the schedule supports the project objectives. There is a clear definition of what constitutes commencement and completion of a task. The schedule describes the sequence of discrete authorized work and their significant task interdependencies. Government development programs typically schedule the discrete authorized work through the use of a network. Production programs typically schedule using an MRP or ERP tool employing a line of balance schedule that supports the project objectives.

The master schedule must agree with the project objectives, include all key events, and reflect a logical sequence of events. It is essential for monitoring progress, analyzing variances, and tracking corrective actions to ensure that all team members are working to the same project schedule.

Schedules add a timeline to the project plan to accomplish the technical scope, allow managers to evaluate actual progress against the established baseline, and to forecast completion dates for remaining work. No specific scheduling software is required, but there must be horizontal and vertical integration through the framework of the WBS and OBS.

Typical Attributes:

An integrated network scheduling system has the following characteristics:

- Distinct tasks that can be summarized by WBS/OBS identifiers to track progress and measure performance.
- The schedule reflects all the time phased discrete work to be accomplished that is traceable to the WBS and the statement of work.
- Critical target dates, project milestones, contractual events, accomplishment criteria, and project decision points are identified and are being used to plan, status, and monitor progress of the work.

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- The schedule describes the sequence of work through use of the significant interdependencies that are indicative of the actual way the work is accomplished and link key detail tasks with summary activities and milestones.
- Task durations and estimates are meaningful and are relatively short (short duration tasks are preferred and should be reflective of the ability to manage).
- Longer tasks need objective interim measures to enable accurate performance assessments.
- Resource estimates from the budget plan are reasonable and are available to support the schedule.
- The baseline is reasonable to achieve project requirements as demonstrated through schedule analysis techniques.
- The baseline schedule is the basis for measuring performance.
- The schedule provides current status and forecasts of completion dates for all discrete authorized work.
- The schedule network relationships can support the development of a critical path for development projects.

Objective evidence may be found in these typical outputs:

- Integrated schedules including master, intermediate (if any), and detailed schedules.
- MRP or ERP schedules, or planned order reports.
- Control account plans which are detail schedules.
- Work authorization documents.

b)	Identify physical products, milestones, technical performance goals, or other indicators that will be used to measure progress.

Management Value

Objective indicators enable measurement of work accomplished, thereby allowing accurate comparison to planned work. Meaningful performance metrics enable better management insight and decision making ensuring that maximum time is allowed for management action to keep the project on plan.

Intent Guideline 7

Identify objective interim measures within tasks to enable accurate performance assessment each month. The master schedule includes key program and contractual requirements. It enables the team to predict when milestones, events, and program decision points can be expected to occur. In a development environment, lower tier schedules must contain specific task start and finish dates that are based on physical accomplishment and are clearly integrated with program time constraints. These tasks will align with the objective interim measures within long work packages to enable accurate performance assessment. A sufficient number of interim measures will be

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defined after the detailed schedule is established to ensure performance is measured as accurately as possible. Interim measures will be based on the completion criteria developed for each increment of work to provide a basis for objectivity, limiting the subjectivity of work accomplished. Accurate schedule status depends on the selection of objective measures of progress to indicate work completion. These measures are necessary to substantiate technical achievement against the schedule plan and justify progression to the next task. A key feature of an interdependent schedule is that it establishes and maintains the relationship between technical achievement and progress statusing.

Typical Attributes:

- Objective completion criteria are determined in advance and used to measure progress to determine achievement of milestones or other indicators.
- Interim milestones and lower tier tasks serve as indicators of progress against which progress is monitored by the control account manager.

Objective evidence may be found in these typical outputs:

- Integrated schedules including master, intermediate (if any), and detailed schedules.
- MRP or ERP production planned order reports.
- Control account plans (may be separate plans or detail schedules).

c)	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. On government contracts, if an over-target baseline is used for performance measurement reporting purposes, prior notification must be provided to the customer.

Management Value

The time-phased performance measurement baseline that represents the planned scope of all authorized work and schedule provides the program manager a reference to assess project performance. It is controlled and reconciled to the target cost plus authorized unpriced work less management reserve. It represents the cumulative, time-phased, budgeted cost for work scheduled. The performance measurement baseline is a key tenet of earned value management.

Intent Guideline 8

The assignment of budgets to scheduled segments of work produces a plan against which actual performance can be compared. This is called the performance measurement baseline (PMB). The establishment, maintenance, and use of the PMB are indispensable to effective performance measurement. The PMB should be in place as early as possible

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after project award or authorization to proceed (ATP). The relationship of individual work tasks with the time-phased resources necessary to accomplish them is established at the control account level. Control accounts should be planned, at least at a summary planning level, to the end of the contract. Any control accounts that cannot be established in the initial planning effort have the critical defining event(s) necessary for planning identified and made an item of continuing management interest.

The PMB is a vehicle for comparison of work accomplished with work scheduled, and actual cost with value of work performed. The PMB includes direct hours/dollars, direct material dollars, other direct charges, and any indirect costs for all authorized work. The PMB represents the formal plan of each control account manager to accomplish all the work assigned in the amount of time allotted and within the amount of budget authorized.

When it is clearly impractical to plan authorized work in control accounts, budget and work will be identified to higher WBS or organizational levels for subdivision into control accounts at the earliest opportunity. The budget for this effort must be identified specifically to the work for which it is intended, be time-phased, its value periodically assessed, and controls established to ensure this budget is not used in performance of other work. The maintenance of realistic budgets, directly tied to an established scope of work, is essential for each organization responsible for performing project effort. Eventually, all the work will be planned by specific organizational elements to the control account level.

Planning horizons can be used to establish reasonable control account level assignments of work and budget. Summary level planning packages may be utilized until the information needed for detail planning becomes available. When that information is available, the detail work packages are planned as far in advance as practicable and planning packages are identified for the remaining work. Work should not commence until an initial detail plan is put in place. For authorized, unpriced work, the contractor will plan and budget near-term effort in control accounts, with the remaining effort and budget planned in summary level planning packages or maintained in undistributed budget (UB). Until definitization, the contractor will continually plan the near term work. After definitization, any budget remaining in undistributed budget will be planned and budgeted within control accounts as soon as practical.

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 total budget allocated to work to exceed the recognized contract budget base (CBB). The resulting value is referred to as an over-target baseline (OTB). Establishment of an over-target baseline may entail replanning future work, replanning in-process work, and/or adjusting variances (cost, schedule or both). This allows the project to increase the amount of budget for the remaining work to a more realistic amount to adequately provide for reasonable budget objectives, work control, and performance measurement.

A thorough analysis of contract status is necessary before the implementation of an over-target baseline. The contractor must perform a detailed estimate of all costs necessary to complete the remaining effort. If the difference between the estimated cost to complete and the remaining budget is significant, the contractor will give advance notification to

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the appropriate parties of the need to increase the remaining budgets. It is important to ensure that both internal management and the customer have a common understanding of the over-target baseline's impact on the performance metrics.

When the contractor and customer project managers are satisfied that the new baseline represents a reasonable plan for completing the contract, the new baseline becomes the basis for future performance measurement.

Typical Attributes:

- PMB reflects the work scope, time phased consistent with the integrated schedule.
- PMB reflects the budget value for the work scope in control accounts and higher level summary planning accounts.
- Control account budgets reflect the planned resources to perform the requirements and can exceed the contract budget base when an over-target baseline is employed.

Objective evidence may be found in these typical outputs:

- Control account plans.
- Summary level planning packages.
- Performance measurement baseline.
- Undistributed budget logs.
- Customer notification of an over-target baseline.
- Work authorization document.

d)	Establish budgets for authorized work with identification of significant cost elements (labor, material, etc.) as needed for internal management and for control of subcontractors.

Management Value

An essential part of project planning and establishing a performance measurement baseline is the establishment of budgets for all the work authorized. Identification of the budget cost elements documents the required resources and integrates work scope with the performing organization.

Intent Guideline 9

Through a work authorization process, establish budgets for all authorized work and identify the work to be done by the responsible organizational elements. Budgets and schedules are established and approved for all the authorized work at the control account level. The control accounts identify the appropriate cost elements (labor, subcontract, material, and other direct costs). It is important to include all resources required to accomplish the work scope.

Since control account budgets and schedules also establish the constraints required for baseline control, care must be exercised in the establishment of control account budgets

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to ensure a viable scope/effort correlation and prevent inadvertent front-loading of the baseline. When establishing control accounts, factors to consider include the:

- Natural flow of work at this management control point;
- Significant contract events that will be supported by completion of the effort within the control account;
- Need to ensure objective measurement of progress by establishing shorter assessment periods;
- Rate structures to be applied to the control account resources.

Each control account contains resources necessary to complete the assigned effort and budgets reflecting these resources. Budgets established at the control account level must be planned by element of cost. In addition:

1. Budgets may be stated either in dollars, hours or other measurable units.
2. It is necessary to use rates that will provide a valid performance measurement baseline.
3. In general, the budget process provides for the following:
   a. Direct budgets allocated to organizations performing the planned work;
   b. Indirect budgets allocated to specific organizations having responsibility for controlling indirect costs;
   c. Identification of any management reserves or undistributed budget.

Typical Attributes:

- Internal reports. Show budgets for each control account and that these budgets are reconcilable to the budget values shown on the latest control account/work package plans and in the work authorization documents.
- Control account/work package plans. Budgets are identified by element of cost (i.e., direct labor dollars/hours, material and/or subcontract dollars, and other direct costs).
- Responsibility assignment matrix (dollarized). Represents the complete project plan and budget. The budget is based on detailed estimates of the amounts of labor, materials, and other resources required to complete each task.
- Resource plan. Identifies the resources needed to accomplish the project and assigning resources to tasks listed in the integrated master schedule.
- Internal reports. Identifies control account budgets that can be summarized to organizational elements. Differentiation is made between direct cost budgets and those which include indirect costs.

Objective evidence may be found in these typical outputs:

- Control account plans by element of cost.
- Work authorization documents.

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- Performance measurement baseline.
- Undistributed budget logs.
- Bills of materials (BOM).
- Responsibility assignment matrix (dollarized).
- Resourced schedules if resourced.
- Resource plan if resources not contained in the control account plans.

e)	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 effort in larger planning packages for budget and scheduling purposes.

Management Value

Budgets established at the work package level identifying specific resource requirements in dollars, hours, or other measurable units provides the detail for effective execution of the baseline plan. The resource is to be time-phased the way the detail work is to be accomplished. This approach provides meaningful product or management-oriented events for performance measurement. Where a control account cannot be planned in detail work packages, the work budget and schedule requirements are held in planning packages.

Intent Guideline 10

Effort contained within a control account is distributed into either work packages or planning packages. Work packages are single tasks assigned to a performing organization for completion, and should be natural subdivisions of control account effort resulting in a definable end product or event. Work package descriptions must clearly distinguish one work package effort from another. A key feature from the standpoint of evaluating accomplishment is the desirability of having work packages that incorporate frequent, objective indicators of progress. When work packages are relatively short, little or no assessment of work-in-progress is required. As work package length increases, work-in-process measurement becomes more subjective, unless objective techniques, such as discrete milestones with preassigned budget values or completion percentages, subdivide them.

Each work package will have the following characteristics:

- It represents units of work at the level where work is performed.
- It is clearly distinguishable from all other work packages.
- It is assigned to a single organizational element, or in an integrated product team environment, there could be a single integrated product team responsible with multiple functional disciplines performing the scope of work.
- It has scheduled start and completion dates and, as applicable, interim milestones, all of which are representative of physical accomplishment.

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- It has a budget or assigned value expressed in terms of dollars, labor hours, or measurable units.
- Its duration is limited to a relatively short span of time. Longer tasks need objective interim measures to enable accurate performance assessments, or it is level of effort (LOE).
- It is integrated with detailed engineering, manufacturing, or other schedules.

Work for a given control account that cannot be planned in detail at the outset, will be divided into larger segments and placed into planning packages within the control account. Planning packages are aggregates of future tasks and budgets, beyond the detail plan, that will be divided into work packages at the earliest practical point in time. Time-phased budgets assigned to planning packages must be supported by a specified scope of work and this relationship must be maintained when detailed planning of the effort occurs.

Typical Attributes:

- Control account plans (CAPs) represent the work assigned to one responsible organizational element on one program WBS element. This is the lowest level in the structure at which the comparison of actual costs to planned budgets and earned value are required. It is also the cost collection point that identifies the cost elements and factors contributing to cost and/or schedule variances.
- Work packages represent detailed jobs, or material items. They are units of work at levels where work is performed and are clearly distinguishable from all other work packages. They are assigned to a single organizational element; have scheduled start and completion dates and, as applicable, interim milestones; have a budget or assigned value expressed in terms of dollars, labor hours, or other measurable units; duration is limited to a relatively short span of time, or it is subdivided by discrete value milestones to facilitate the objective measurement techniques of work performed, or it is LOE; and is integrated with detailed engineering, manufacturing, or other schedules.
- A planning package is the logical aggregation of work within a control account, normally the far-term effort, that can be identified and budgeted in early baseline planning, but can not yet be defined into discrete, apportioned, or level of effort work packages. Planning package plans must reflect the manner in which the work is to be performed.

Objective evidence may be found in these typical outputs:

- Control account plans divided into work packages and planning packages.
- Control account schedules when used.
- Control account time phased budgets.

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f)	Provide that the sum of all work package budgets plus planning package budgets within a control account equals the control account budget.

Management Value

The integrity of the performance measurement baseline is maintained when the budget of the control account equals the sum of its work package and planning package budgets. When the budget of the control account equals the sum of its work package and planning package budgets it prevents duplicate recording of budgets.

Intent Guideline 11

All control accounts must contain a budget, schedule, and scope of work and should realistically represent the work assigned and budgeted to the organizational units. In all cases, the value of the budget assigned to individual work packages and planning packages within the control account must sum to the total value authorized for the control account. At no time should a control account manager have a budget with no assigned scope of work.

Typical Attributes:

Control account plans (CAPs) represent the work assigned to one responsible organizational element on one program work breakdown structure element; the lowest level in the structure at which the comparison of actual costs to planned budgets and earned value are required; the cost collection point that will identify the cost elements and factors contributing to cost and/or schedule performance.

Objective evidence may be found in these typical outputs:

- Control account plan total budget.
- Work package budget.
- Planning package budget.

g)	Identify and control level of effort activity by time-phased budgets established for this purpose. Only that effort which is unmeasurable or for which measurement is impracticable may be classified as level of effort.

Management Value

Meaningful product or management-oriented events are critical for performance measurement. Measurement of level of effort (LOE) activity is impracticable and provides no visibility into actual performance; therefore, its use must be minimized.

Intent Guideline 12

Each task on the project needs to be assessed using the best method to budget and measure its progress toward completion. Level of effort is defined as having no measurable output or product at the work package level. Level of effort must be limited to those activities that are unable to be measured discretely to avoid distorting project performance data. Level of effort work packages should be separately identified from discrete effort work packages and apportioned effort work packages. Budgets for level of

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effort activity must have a sound basis of estimate and be time phased to properly reflect when work will be accomplished.

Typical Attributes

Level of effort work packages contain tasks of a general or supportive nature which do not produce definite end products, must be separately evaluated from discrete work packages within the control account, and contain time-phased budgets for planning and control.

- The amount of LOE activity will vary among performing organizations, but it must be held to the lowest practical level.
- Level of effort budgets should be separately substantiated and planned as direct labor, material/subcontract, or other direct costs. Level of effort should be budgeted on a time-phased basis for control and reporting purposes.
- When level of effort and discrete work packages are mixed within the same control account, the control account manager must ensure visibility into the earned value technique for measuring performance of the discrete effort.
- The earned value for level of effort work packages equals the time phased budget.

Objective evidence may be found in these typical outputs:

- Control account plans identify level of effort work packages and budgets.

h)	Establish overhead budgets for each significant organizational component of the company 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.

Management Value

Visibility into direct and indirect costs is essential for successful management of a project. Therefore, it is important to have a documented process and organizations established specifically to manage and control indirect costs. 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 organization manager level.

Intent Guideline 13

Establish indirect (overhead, burden, and G&A expense) budgets at the appropriate organizational level for each pool and sub-cost element. It is important to have an indirect budgeting and forecasting process, because indirect costs account for a major portion of the cost of any project. As such, the budgetary control and management of this category of cost cannot be overlooked or minimized. Indirect budgets on the project are established and planned with the established direct budgets consistent with the contractor's accounting procedures.

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Typical Attributes:

- Organization charts are generally contained within the contractor's system description identifying personnel or organizations responsible for maintaining indirect costs.
- Contractor's overhead policies and procedures are generally described in the contractor's system description and represent a rational, traceable process.
- Cost accounting standards (CAS) established by the Cost Accounting Standards Board (CASB), ensures consistent and proper accounting for direct and indirect costs that are applied to government contracts; direct costs are any cost that may be identified specifically with a particular cost objective; indirect costs are costs which, because of their incurrence for common or joint objectives, are not readily subject to treatment as direct costs.
- CAS disclosure statement defines the content and processes of the contractor's management of indirect costs and generally includes a definition of indirect expenses and overhead pools.
- Forward pricing forecasts identify projected overhead rates beyond current year.

Objective evidence may be found in these typical outputs:

- Documented process for managing indirect costs.
- Organizational structure identifying ownership responsibility and authority levels.
- Indirect cost policies and procedures.
- Chart of accounts.
- Organizational charts.
- Forward pricing forecast (including sales forecast and business base projections).
- CAS disclosure statement, if applicable.
- Indirect budget and performance reports.

i)	Identify management reserves and undistributed budget.

Management Value

Project managers must realize the performance measurement baseline planning process contains risk and identify a management reserve contingency for unplanned activity within the project scope. This facilitates the maintaining of budgets for work accomplished and provides effective performance measurement data for management. In order to assure that budget for newly authorized efforts remains tied to the associated scope during the initial planning process, undistributed budget (UB) has been designated as the short term holding account. Once the responsible organization(s) has been identified, the budget will transfer from undistributed budget to the appropriate control account(s). This ensures budget and scope will not be transferred independently.

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Intent Guideline 14

Identify and control management reserve (MR) and undistributed budget. Management reserve is budget for work scope that will arise during the course of the project, but cannot be identified in advance. Because management reserve is budget that is not as yet tied to work, it does not form part of the performance measurement baseline. The management reserve budget should be commensurate with the level of risks identified by the project and/or withheld for management control purposes.

Undistributed budget is budget that is applicable to specific project effort but has not yet been distributed to control accounts. It is a transient amount; because once it is distributed it ceases to be undistributed budget and instead is incorporated in its relevant control account. Because undistributed budget is budget that is tied to work, it does form part of the performance measurement baseline. Undistributed budget accounts are to be cleared in a reasonably timely manner. Undistributed budget accounts are to be assigned to the performance measurement baseline when the work is established in the performance measurement baseline, normally within 90 days and prior to work starting. It is recognized that some circumstances, such as delays in contract direction will impact the timely assignment of undistributed budget to work packages.

Typical Attributes:

- Program control logs including:
  - Management reserve (showing month end values; monthly sources and uses to the control account; and current value).
  - Undistributed budget (showing month end values; monthly sources and uses to the control account; current value).
  - Performance measurement baseline (showing month end values; monthly changes from/to management reserve and undistributed budget; current value).
  - Contract budget base (showing month end values; monthly changes identifying contract modifications; current value).
- Monthly performance reports to verify starting and ending values are consistent with various logs.

Objective evidence may be found in these typical outputs:

- Project control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base).
- Contract performance reports (CPRs), if applicable.

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j)	Provide that the program target cost goal is reconciled with the sum of all internal program budgets and management reserves.

Management Value

A project baseline that reflects the common agreement between the two parties provides a common reference point for progress assessment. It provides recognition of contractual requirements and precludes unauthorized changes to the performance measurement baseline. The project target cost must be reconciled with the performance measurement baseline and management reserve.

Intent Guideline 15

Reconcile the project value (target cost plus authorized, unpriced work) with the sum of all control account budgets, indirect budgets, management reserves, and undistributed budgets.

Typical Attributes:

- Program control logs including:
  - Management reserve (showing month end values; monthly sources and uses to the control account; current value).
  - Undistributed budget (showing month end values; monthly sources and uses to the control account; current value).
  - Performance measurement baseline (showing month end values; monthly changes from/to management reserve and undistributed budget; current value).
  - Contract budget base (showing month end values; monthly changes identifying contract modifications; current value) reconciled to program target cost.
- Contract and modification control logs identifying authorized target cost.

Objective evidence may be found in these typical outputs:

- Project control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base) reconciled to project target cost.
- Contract performance reports (CPRs), if applicable.
- Internal report showing the summarization from cost account to the performance measurement baseline.

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2.3 Accounting Considerations

a)	Record direct costs in a manner consistent with the budgets in a formal system controlled by the general books of account.

Management Value

Direct cost must be assigned to a project consistent with the budgets for effective performance management. A project cost-charging structure established in the accounting system ensures that actual costs collected are directly compared with associated budgets for that work.

Intent Guideline 16

Accumulate direct costs in the formal accounting system in a manner consistent with the way the related work is planned and budgeted. Actual cost reported in the performance reports agrees with the costs recorded in the general books of account (accounting system) or can be explained as timing differences.

Timing differences that may occur between accounting system and project performance reports must be reconcilable.

Of particular interest is the accounting for material (at consumption, receipt, inventory acceptance, or inventory release). The basic requirement is to account for materials in a manner consistent with the way in which materials are budgeted.

Typical Attributes:

- Contractor's accounting manual/procedures identifying the methodology of handling various actual costs.
- Contractor's cost accounting standards disclosure statement identifying treatment of direct costs (direct material, labor, and other direct costs), indirect costs, depreciation and capitalization, and other costs and credits.
- Control account actual costs/general ledger reconciliation.
- Contractor's process to ensure actual costs and performance are recorded in the same accounting period.

Objective evidence may be found in these typical outputs:

- Reconciliation of project costs with the accounting system.
- Actual costs are reported at the control account level at a minimum.

b)	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.

Management Value

Actual costs need to be available at all levels of the WBS to support project management with performance measurement data. Cost collection accounts mapped to the WBS, and

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the WBS roll-up structure containing no division/allocation of lower-level cost to multiple higher-level WBS elements, ensures performance measurement data integrity when summarized by WBS.

Intent Guideline 17

A work order/job order/task code charge number structure must exist that uniquely identifies costs down to the control account level allowing for accumulation and summarization of costs to higher levels. Allowable costs collected within the control account by element of expense "roll-up" from the control account level through the WBS to the top level without being divided at any level among two or more higher-level elements. Cost collection accounts map to the WBS, and the WBS roll-up structure contains no division/allocation of lower-level cost to multiple higher-level WBS elements. When common costs are collected in separate control accounts for like items or services they are allocated to appropriate control accounts in each project.

Typical Attributes:

- Cost collection account structure showing charge number hierarchy.
- WBS structure (roll-up scheme) showing hierarchy of WBS elements, control accounts, and work packages.
- WBS/cost collection mapping showing the relationship between charge numbers and control accounts and/or work packages.
- The program established cost charging structure will ensure that actual costs are collected so that direct comparison with associated budgets can be made at the appropriate WBS level(s).

Objective evidence may be found in these typical outputs:

- Cost collection account structure.
- WBS/cost collection mapping.
- WBS structure (roll-up scheme).
- Monthly performance report.

c)	Summarize direct costs from the control accounts into the contractor's organizational elements without allocation of a single control account to two or more organizational elements.

Management Value

Actual costs need to be available at all levels of the OBS to support project management with performance measurement data. Cost collection accounts mapped to the OBS, and the OBS roll-up structure containing no division/allocation of lower-level cost to multiple higher-level OBS elements, ensures performance measurement data integrity when summarized by OBS.

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Intent Guideline 18

Allowable costs collected within the control account by element of expense "roll-up" from the control account level through the OBS to the top level without being divided at any level among two or more higher-level elements. This guideline and the one before it are identical, with the exception that this one deals with OBS data summarization while the previous one dealt with WBS data summarization. In either case the intent is the same: actual cost collected at the control account level may not be rolled up (i.e., summarized) to multiple higher-level elements. When common costs are collected in separate control accounts for like items or services they are allocated to appropriate control accounts in each project.

Typical Attributes:

- Organization charts showing the contractor's organizational hierarchal structure.
- Responsibility assignment matrix showing the intersection of OBS organizations and WBS elements, which is the control account.
- OBS structure (roll-up scheme) showing the relationship of charge numbers to the OBS.
- The program established cost charging structure will ensure that actual costs are collected so that direct comparison with associated budgets can be made at the appropriate organizational level(s).

Objective evidence may be found in these typical outputs:

- Responsibility assignment matrix.
- Organization charts.
- OBS structure (roll-up scheme).
- Contract performance report (format 2 where required).

d)	Record all indirect costs which will be allocated to the project.

Management Value

Visibility into direct and indirect costs is essential for successful management of a project. Therefore, it is important to have a documented process and organizations established specifically to manage and control indirect costs. 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 function or organization manager level.

Intent Guideline 19

Record all indirect costs for the project in the accounting system. Allocate them to the recorded direct costs per the documented procedure to assure that all projects benefiting from the indirect costs will receive their fair share.

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Typical Attributes:

- Cost collection account structure. Identifies the chargeable object for all cost centers.
- WBS/cost collection mapping. Identifies the responsible organization for budgeting and controlling indirect cost, time-phased budgets/forecast established at same level as cost collection for comparison.
- WBS structure (roll-up scheme). Hierarchy scheme from point of allocation to WBS/OBS to total program level.
- Cost accounting standards disclosure statement. Identifies the allocation base and indirect cost pools by function element of cost.
- Accounting procedures showing the responsible organization for incurring indirect cost corresponds to the level of management control and categorizes fixed and variable cost methods of control.
- Organization chart. Identifies management responsibility for controlling indirect staff and ability to influence indirect costs.

Objective evidence may be found in these typical outputs:

- Cost collection account structure.
- WBS/cost collection mapping.
- WBS structure (roll-up scheme).
- Cost accounting standards disclosure statement.

e)	Identify unit costs, equivalent unit costs, or lot costs when needed.

Management Value

A manufacturing accounting system capable of isolating unit and lot costs in a production environment, allows the flexibility to plan, measure performance, and forecast in a more efficient way when there are multiple projects in the same production line.

Intent Guideline 20

Identify unit costs, equivalent unit costs, or lot costs when needed. Where the work is budgeted by unit, equivalent units, or lot costs, as appropriate for the work being planned, ensure that the accounting system produces actual unit, equivalent unit, or lot costs for purposes of measuring cost performance to plan. When units are taken off the line in more or less a random order according to the delivery agreements of the different customers' projects, it is sufficient to establish "equivalent unit cost" (i.e., all things being equal, on a "mature" production run, each unit's cost is approximately equivalent to every other unit's cost).

Typical Attributes:

- Manufacturing requirements planning (MRP) project cost collection structure.

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- Enterprise requirements planning (ERP) supports the identification of unit costs, equivalent unit costs, or lot cost when needed including differentiation of work in process. Expressed in terms of labor, material, other direct cost, indirect cost, as well as distinguishing between recurring (e.g. production) and non-recurring (e.g. design, development, travel and expense) costs.

Objective evidence may be found in these typical outputs:

- Project cost collection structure (MRP).
- ERP system supports the identification of unit costs, equivalent unit costs, or lot costs when needed including differentiation of work in process.

f)	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 performance measurement at the point in time most suitable for the category of material involved, but no earlier than the time of progress payments or actual receipt of material.
3)	Full accountability of all material purchased for the project including the residual inventory.

Management Value

Material items consumed in the production of project deliverables are accounted for and progress is measured at the point most closely aligned to the actual consumption. Residual inventory provides visibility into excess material for the current deliverables available for replacement of failures in the current project or future projects having similar deliverables.

Intent Guideline 21

Material accounting systems must adhere to these three characteristics:

1. The material accounting system provides full accountability and effective performance measurement of all material (including residual inventory) purchased for the project.
2. Material costs must be accurately charged to control accounts using recognized, acceptable costing techniques (e.g. performance recorded at receipt of material for high dollar material, or when material will be used within the same accounting period, material usage, or release to work in process that is consistent with the planned budget in the same accounting period that performance is claimed).
3. When necessary, the use of estimated actual costs to ensure accurate performance measurement is required.

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Typical Attributes:

- Performance reports showing material cost/schedule variances, earned value claimed in same accounting period of actual cost, material performance recorded no earlier than material receipt, issue from inventory, or material consumption.
- Control account plans showing time-phased material budgets, earned value technique, high/low material.
- The material system needs to account for various methods of charging material cost from inventory in accordance with cost accounting standards inventory costing methods, i.e., first in first out (FIFO), moving average, weighted average, standard cost, and last in first out (LIFO). Identify accountability for all material purchased for the program including material issues to control accounts, return of unused material, scrap quantity and disposition, and residual inventory.

Objective evidence may be found in these typical outputs:

- Performance reports.
- Control account plans.
- Material system reports.

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2.4 Analysis and Management Reports

a)	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:
1)	Comparison of the amount of planned budget and the amount of budget earned for work accomplished. This comparison provides the schedule variance.
2)	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.

Management Value

Earned value management system (EVMS) performance data that reconciles to the general books of account (accounting system) and provides for management control. Visibility into project performance helps the project manager to focus resources on those areas in need of attention.

Intent Guideline 22

On at least a monthly basis, generate schedule variance and cost variance data that provide visibility into root causes and establish actions to achieve project completion. Accurate and reliable EVMS data supports management control needs by allowing the project manager to focus on those areas in need of attention. The first intent of this criterion is to establish the fact that analysis, to remain viable, must be accomplished on a regular, periodic basis. The second intent is to foster analyses and identification of root cause and resulting impacts at the control account level. Since the control account is normally the lowest level at which management and control responsibility exists for specific WBS increments of work, it is the logical point for not only the planning, scheduling, budgeting, and accounting efforts but also for the analysis effort as well. All data analyzed must be from, or be reconcilable with, the accounting system.

In order for control account manager's to have full management control responsibility, they must be able to analyze the work performance and associated costs against the performance measurement baseline. Since the control account is the level at which performance measurement is performed, the project manager must, as a minimum, ensure traceability of project performance down to the control account. However, analysis should be performed at the most meaningful level of the WBS, which may be determined by risk, critical path, technical performance metrics, or utilization of thresholds.

Typical Attributes:

- Monthly performance report:
  - Budget, earned value, and actual costs (reconcilable with accounting system);
  - Cost variance (CV);
  - Schedule variance (SV);

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  - Variance at completion (VAR);
  - Variance analysis narrative (root causes, impacts at completion, and management actions);
- Summarized performance measurement data from control account (minimum) through WBS/OBS hierarchy to the program level.

Objective evidence may be found in these typical outputs:

- Monthly performance report (cost variance, schedule variance, and variance at completion analysis).
- Variance analysis data (root causes, impacts at completion, and management actions).

b)	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.

Management Value

Analysis of deviations from plan for both schedule and cost at least monthly provides management at all levels the ability to rapidly and effectively implement corrective actions to accomplish the project objectives with an understanding of the project risk and the causes of the risk.

Schedule variance does not indicate when a completed activity is a critical event or if delays in activity's completion will affect the completion of the project. A scheduling system provides this data. It is predictive of the final outcome if future performance does not change.

Cost variance is predictive of the final cost outcome if the future performance does not change.

Comparison of schedule and associated cost impacts establishes an understanding of current project conditions. This understanding may help facilitate corrective actions as necessary.

Intent Guideline 23

The purpose of this guideline is to ensure both a time-based schedule management analysis of significant scheduling differences and a budget based cost management analysis of significant performance management baseline variances occurs.

Comparing the budget value of work completed to the budget value of work scheduled during a given period of time provides a valuable indication of schedule status in terms of dollars worth of work accomplished. This schedule variance (SV) may not, however, clearly indicate whether or not scheduled milestones are being met, since some work may have been performed out of sequence or ahead of schedule. Schedule variance does not indicate whether a completed activity is a critical event or if delays in an activity's completion will affect the completion date of the project.

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A formal time-phased scheduling system, therefore, must provide the means of determining the status of specific activities, milestones, and critical events. Schedule analysis must address the time impact to the schedule plan when a significant variance exists. By addressing the time impact for each significant variance a true and representative impact to the schedule plan is quantified. A key concept required to support schedule analysis is to ensure that work is planned in discrete elements that reflect actual accomplishment. This ensures time-based schedule variances are ultimately reported. The analysis should identify potential schedule accomplishment and milestone problems.

Typical Attributes:

- Schedule (time-based) and cost (budget based) variances are identified at an actionable level.
- Cause and impact are identified in sufficient detail needed for project management.
- Corrective actions are assessed in a timely manner.

Objective evidence may be found in these typical outputs:

- Variance analyses (budget based schedule variances and cost variances).
- Management action plans.
- Updated schedule task completion and cost at completion forecasts.
- Project schedules and schedule analysis outputs.

c)	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.

Management Value

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.

Intent Guideline 24

Indirect rate forecast and control is crucial to meeting project cost objectives. This guideline requires a monthly indirect analysis, at the level of assigned responsibility, comparing indirect budgets to indirect actual costs (with the stipulation that the cause of resultant variance be explained). The importance of analyzing indirect performance requires the exercise of maximum discipline in following indirect procedures.

Typical Attributes:

- Indirect variance analyses:
  - Budget to actual comparison by element of cost from management control point up through WBS/OBS to project level;

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  - Variance thresholds by overhead category;
  - Responsible overhead manager identifies root cause (i.e. usage variance, change in business volume, or rate variance due to a change in direct base).
- Indirect management action plans:
  - Corrective action plans identified to reduce or eliminate variance;
  - Performance metrics.

Objective evidence may be found in these typical outputs:

- Indirect variance analyses.
- Indirect management action plans.
- Indirect updated schedule and cost forecasts.

d)	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.

Management Value

Variances provide an understanding of conditions, allowing the project manager to properly allocate available resources to mitigate project risk. They also identify significant problem areas from all levels of the organization and project scope of work, derived from the same data sources. Variances provide valuable management information.

Intent Guideline 25

Use the same data for internal management needs and for reporting to the customer. Since the WBS and the OBS exist as a formal and disciplined framework for a comprehensive roll-up of all data elements, they become the ideal framework for summarizing data from the control account level to the management reporting level.

Typical Attributes:

- Variance analyses. Internal/external reporting thresholds and narrative analysis providing root cause, impact, corrective action.
- Schedule and cost performance reports. Schedule variance, cost variance, variance at complete from control account up through WBS/OBS reporting structure hierarchy to total program level.
- Management action plans. Corrective action plan/mitigation plan, task, milestones, exit criteria, schedules.

Objective evidence may be found in these typical outputs:

- Variance analyses.
- Schedule and cost performance reports.
- Management action plans.

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- Updated schedule and cost forecasts.

e)	Implement managerial action taken as the result of earned value information.

Management Value

Earned value information provides management with early insight into the extent of problems. Management action is required to mitigate the impacts on the project objectives.

Intent Guideline 26

Assess management actions and modify them as required to achieve project objectives. Earned value data must be utilized by all levels of management for effective project execution. Because of this, the data produced by the earned value management system must be available to managers on a timely basis and must be of sufficient quality to ensure that effective management decisions can be made as a result of its analysis. The project's internal reports and the reports forwarded to their customer must indicate the overall cost and schedule impacts of such problems on the project.

Typical Attributes:

- Follow-up of the implementation to see if what was planned actually got implemented.
- Reasonableness of the corrective action.
- Validity of the problem identified.

Objective evidence may be found in these typical outputs:

- To complete performance index (TCPI).
- Independent completion estimates.
- Risk management data and similar metrics.
- Management action plans and review briefings.
- Variance analyses.

f)	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.

Management Value

Estimates at completion (EACs) based on predictive performance measures increase the probability that the project can be executed within the reported EAC. When EACs are analyzed at least monthly and updated as required, the robustness of the financial reporting requirements is enhanced, thereby reducing the potential for surprises. Monthly EAC reviews are essential for management decisions including the planning of project

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future funding requirements. Periodic comprehensive EAC assessment based on common program ground rules is beneficial for projecting future funding.

Intent Guideline 27

On a monthly basis, the control account manager should review the status of the expended effort and the achievability of the forecast and significant changes briefed to program management. A comprehensive EAC is accomplished on a periodic basis using all available information to arrive at the best possible estimate at completion. This is done by:

a. Evaluating performance to date efficiency achieved by performing organizations for completed work and comparing it to remaining budgets;

b. Assessing commitment values for material to complete the remaining work;

c. Estimating future conditions to derive the most accurate estimate at completion.

Comparisons of this estimate to budgets for the associated effort must be made frequently enough for management to ensure project performance and resource availability will not be adversely impacted. Prudent maintenance of the control account level EAC by the control account manager ensures that the EAC reflects a valid projection of project costs.

Typical Attributes:

- Timely and comprehensive assessments of the effort required for completing all work packages and planning packages in the control account plan.
- Control account manager updates the EAC to reflect changes in budget and/or integrated master schedule when there is material significance.
- Time-phased ETC based on an analysis of remaining tasks in the integrated master schedule and projected resource plan.
- Control account manager should generate the EAC at the work package and planning package level and then sort and summarize by WBS and OBS to the control account level.
- Contract performance report totals for the EAC should reconcile with the corresponding time-phased resource plan.
- EACs should consider all emerging risks and opportunities within the project's risk register (or other similar database) which will impact the integrated master schedule and resource plan for the remainder of the work.
- EAC results are communicated to the customer in internal reports and in funding documents.

Objective evidence may be found in these typical outputs:

- Control account plans.
- Basis of estimates.
- Risk management plans (identification, mitigation, and opportunities).
- Operational metrics.

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- Earned value metrics.
- Estimates at completion.
- Material and subcontractor performance data.

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2.5 Revisions and Data Maintenance

a)	Incorporate authorized changes in a timely manner, recording the effects of such changes in the budgets and schedules. In the directed effort prior to negotiation of a change, base such revisions on the amount estimated and budgeted to the program organizations.

Management Value

Incorporating authorized changes in a timely manner maintains the integrity of the performance measurement baseline, and thus its effectiveness as a baseline against which to manage and control performance.

Intent Guideline 28

Incorporate the work scope for authorized changes into the performance measurement baseline in a documented, disciplined, and timely manner. Adherence to this guideline ensures that budget, schedule, and work remain coupled. For unpriced change orders, the contractor will develop its best estimate for planning and budgeting purposes for incorporation into the performance measurement baseline. Incorporating changes will not arbitrarily eliminate existing cost and schedule variances. Rate changes and economic price adjustments may also be made as appropriate.

Typical Attributes:

- Contractual change documents (external). May take various forms, (e.g., contract modification, letter to proceed from contracts or legal, not to exceed letter, change order, engineering change order, delivery order, basic ordering agreement, etc.) which transmit and authorize the change or addition to work, budget, and schedule.
- Contractor's internal earned value management system documentation (e.g., change request form, program directive, etc.) facilitating the change. It should provide the rationale/justification, approval process, work scope additions or deletions by integrated product team or WBS, dollars, changes to schedules, estimate at completion, etc.).
- Basis of estimate (if not yet negotiated).
- Change control logs including management reserve justification, dollar amount and receiving WBS; undistributed budget justification, dollar amount and receiving WBS; performance measurement baseline dollar amount; and contract budget base total.
- Statement of work (amendments or revisions), WBS (changes if applicable), and WBS dictionary (additions and/or deletions to scope).
- Work authorization documents authorizing new work scope, schedule, budget and authorization to proceed, if not already captured by the internal change request process.

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- Control account/work package/planning package plans showing revised work scope, duration, and budget.
- Master schedules, intermediate schedules (if any), and detailed schedules showing revised work scope and duration, changes to linkages, etc.
- Management reports (contract performance reports or other applicable management reports) showing timely incorporation of new work scope.

Objective evidence may be found in these typical outputs:

- Contractual change documents.
- Change control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base).
- Control account/work package/planning package plans.
- Master schedules, intermediate schedules (if any), and detailed schedules.
- Statement of work, WBS, and WBS dictionary.
- Work authorization documents.
- Management reports (contract performance reports or other applicable management reports).

b)	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.

Management Value

The integrity of the current performance measurement baseline can be verified by ensuring that budget revisions are reconciled.

Intent Guideline 29

Budget changes are controlled and understood in terms of scope, resources, and schedule. Budget reflects current levels of authorized work. Budget revisions are traceable to authorized contractual targets and control account budgets. Management reserve may be used for future unopened work when additional in scope work has been identified and replanning actions cannot be handled within the existing budgets and schedule constraints of the control accounts.

Typical Attributes:

- Contractual change documents (external). May take various forms, (e.g., contract modification, letter to proceed from contracts or legal, not to exceed letter, change order, engineering change order, delivery order, basic ordering agreement, etc.) which transmit and authorize the change or addition to work, budget and schedule.
- Contractor's internal earned value management system documentation (e.g., change request form, program directive, etc.) facilitating the change. It should

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provide the rationale/justification, approval process, work scope additions or deletions by integrated product team or WBS, dollars, changes to schedules, estimate at completion, etc.) .

- Basis of estimate (if not yet negotiated).
- Change control logs including management reserve justification, dollar amount and receiving WBS; undistributed budget justification, dollar amount and receiving WBS; performance measurement baseline dollar amount; and contract budget base total.
- Statement of work (amendments or revisions), WBS (changes if applicable), and WBS dictionary (additions and/or deletions to scope).
- Work authorization documents authorizing new work scope, schedule, budget and authorization to proceed, if not already captured by the internal change request process.
- Control account/work package/planning package plans showing revised work scope, duration, and budget.
- Master schedules, intermediate schedules (if any), and detailed schedules showing revised work scope and duration, changes revised work scope and duration, changes to linkages, etc.
- Management reports (contract performance reports or other applicable management reports) showing timely incorporation of new work scope.

Objective evidence may be found in these typical outputs:

- Contractual change documents.
- Change control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base).

c)	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.

Management Value

Retroactive changes to the baseline may mask variance trends and prevent use of the performance data to project estimates of cost and schedule at completion.

Intent Guideline 30

Control retroactive adjustments (including those in the current period) to costs, making only routine accounting adjustments (e.g. definitization of unpriced change orders, rate changes, and economic price adjustments), customer-directed changes, or data entry corrections. This is necessary to ensure baseline integrity and accuracy of performance measurement data. Retroactive budget adjustments may delay visibility of overall project

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variance from plan, thus reducing the alternatives available to managers for project redirection or termination.

Typical Attributes:

- Change control process defines policy regarding retroactive changes that include conditions for use or prohibitions, approvals and justifications, and evidence of discipline and control.
- Change control logs record change activity.
- Review the current dollarized time-phased baseline plan. Compare it to the previous period baseline plan to identify any differences and to verify all changes have been identified.
- Scheduling system reflects schedule inputs concerning times, dates, durations, percentage complete, etc.
- Negative journal entries. When not a result of error corrections or routine accounting adjustments, they have appropriate explanations.
- Earned value input source documents. Negative or inappropriate amounts must have appropriate explanations.
- Management reports. Current period data on format 1 and format 3 of contract performance report will reflect any retroactive changes and format 5 for related explanations.

Objective evidence may be found in these typical outputs:

- Change control logs.
- Retroactive change control process including approval.

d)	Prevent revisions to the program budget except for authorized changes.

Management Value

Changes made outside the authorized baseline control processes compromise the integrity of performance trend data and delay visibility into overall project variance from plan, thus reducing the alternatives available to managers for project redirection or termination.

Intent Guideline 31

Prevent unauthorized revisions to the performance measurement baseline. Any changes to the project must be approved and implemented following the baseline management control process. This control precludes the inadvertent implementation of a budget baseline greater than the project budget. When the performance budget or schedule objectives exceed the project plan and are recognized in the performance measurement baseline, it is identified as an over-target baseline.

Typical Attributes:

- Change control logs reflect changes to the performance measurement baseline or contract budget base.

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- Control account/work package/planning package plans reflect approved budget changes.
- Work authorization documents reflect authorized changes to budget.
- Time-phased budget "run" reflects authorized changes to the budget.
- Management reports (contract performance reports or other applicable management reports) reflect changes to the contract budget base or additions on formats 1, 2, 3, and 5 of the contract performance report if required.

Objective evidence may be found in these typical outputs:

- Change control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base).
- Control account/work package/planning package plans.
- Master schedules, intermediate schedules (if any), and detailed schedules.
- Statement of work, WBS, and WBS dictionary.
- Work authorization documents.
- Management reports (contract performance reports or other applicable management reports).

e)	Document changes to the performance measurement baseline.

Management Value

By ensuring that budget and schedule revisions are documented and traceable, the integrity of the performance measurement baseline is maintained and can be verified. This provides control account managers with valid control account plans against which to execute and measure performance.

Intent Guideline 32

The performance measurement baseline should always reflect the most current plan for accomplishing the effort. Authorized changes must be quickly recorded in the system and incorporated into all relevant planning. Planning and authorization documents must be updated accordingly prior to the commencement of new work.

Typical Attributes:

- Change control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base) reflect changes from the original contract budget base.
- Control account/work package/planning package plans reflect updated schedule and budget plans for all authorized changes.
- Master schedules, intermediate schedules (if any), and detailed schedules reflect incorporation of latest authorized changes.
- Time-phased budget "run" reflects authorized changes to the budget.

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- Statement of work, WBS, and WBS dictionary. Review for incorporation of all authorized changes.
- Work authorization documents reflect incorporation of all authorized changes.
- Management reports (contract performance reports or other applicable management reports) reflect incorporation of all authorized changes.

Objective evidence may be found in these typical outputs:

- Change control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base).
- Control account/work package/planning package plans.
- Master schedules, intermediate schedules (if any), and detailed schedules.
- Statement of work, WBS, and WBS Dictionary.
- Work authorization documents.
- Management reports (contract performance reports or other applicable management reports).

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3 EXAMPLE PROCESS DESCRIPTION COMPLIANCE MAP

3.1 Developing a Compliance Map to the EVMS Guidelines

The purpose of this section and Appendix A is to provide an example and template that can be used as a starting point for a contractor who needs to develop a compliance map to the ANSI/EIA EVMS Guidelines for their business process.

The example in this section uses guideline 1 to provide a sample description of how a company's business process complies with the requirements of a given guideline.

Appendix A provides a compliance map template for the 32 guidelines that can be tailored to the contractor's business environment. The compliance section for each guideline must be completed based on how the company does business.

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3.2 Example Compliance Map

The ACME Corporation
EARNED VALUE MANAGEMENT SYSTEM
PROCESS DESCRIPTION COMPLIANCE TO THE ANSI/EIA 748 STANDARD

2.1 Organization

a. 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.

Intent Guideline 1

A WBS is a direct representation of the work scope in the project, documenting the hierarchy and description of the tasks to be performed and relationship to the product deliverables. The WBS breaks down all authorized work scope into appropriate elements for planning, budgeting, scheduling, cost accounting, work authorization, measuring progress, and management control. The WBS must be extended to the level necessary for management action and control based on the complexity of the work. Each item in the WBS is assigned a unique identifier. These identifiers can provide a structure for a hierarchical summation of costs and resources. A WBS dictionary defines the work scope for each element in the WBS.

Typical Attributes:

- Only one WBS is used per project and it contains all project work including revisions for authorized changes and modifications.
- WBS contains all contract line items and end items.
- WBS identifies all WBS elements specified for external reporting.
- WBS is extended at a minimum to the control account level.
- WBS elements include a complete definition of work scope requirements.
- WBS will evolve as the project requirements change.

Objective evidence may be found in these typical outputs:

- Work breakdown structure (WBS).
- WBS dictionary (may or may not be used, but a method to reconcile the statement of work to the WBS structure must be demonstrated).

Earned Value Management System Description Compliance

The development and maintenance of the WBS for each project is described in Section 2 of ACME corporation EVM system description. Each project must comply with the requirements described in Section 2. In summary, the requirements are as follows.

- The WBS must be created and maintained in ACME's corporate EVM system.
- A single WBS structure must be developed and maintained per project for the entire life of the project.
- The WBS structure includes fields to identify and include such details as a:
    - Unique WBS number for each WBS element;
    - Short description;
    - Parent element identification (with the exception of the top WBS element);

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- Contract line item number for cross reference to the statement of work;
- Reporting level required for internal management and customer reporting purposes;
- The lowest level in the WBS is the control account level (typically level 4 or 5 in the WBS structure depending on the needs of the project).

- The WBS Dictionary online form must be used to describe the scope of work for all WBS elements. This description includes, but is not limited to, specific details such as:
  - End result or expected work product;
  - Related work to identify dependencies between elements of work;
  - Risk factors;
  - Assumptions or limitations;
  - Technical specifications;
  - Related documents or other materials that are required for the work team to successfully complete their assignment.

Applicable process documents and desk top instructions are listed below. Who is responsible for what is also noted.

- WBS Audit. The project control team uses this process and related checklist to verify the WBS is complete and there is a one to one map between the WBS elements and the statement of work. It is also used to verify all WBS elements have an entry in the WBS Dictionary and the work scope details are clear and specific. This audit is conducted as part of the initial WBS development process, before the performance measurement baseline is set, and when any contract modifications impact the scope of work.
- Maintaining the WBS. Desk top instructions used by the project control team for entering and maintaining the WBS data in the ACME EVM system. Only the project control team members have the authorization to create or modify the WBS data.
- Maintaining the WBS Dictionary. Desk top instructions used by the control account managers and IPT team members to enter and maintain the WBS Dictionary data.
- Maintaining Control Accounts. Desk top instructions for entering and maintaining the control account data in the ACME EVM system. Only the project control team members and the assigned control account person have the authorization to modify the control accounts in the system.

Outputs available from the ACME EVM system for each project include:

- The work breakdown structure;
- WBS Dictionary.

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Appendix A
Process Description Compliance Map Template

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Company or Organization Name
EARNED VALUE MANAGEMENT SYSTEM
PROCESS DESCRIPTION COMPLIANCE TO THE ANSI/EIA 748 STANDARD

2.1 Organization

a) 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.

Intent Guideline 1

A WBS is a direct representation of the work scope in the project, documenting the hierarchy and description of the tasks to be performed and relationship to the product deliverables. The WBS breaks down all authorized work scope into appropriate elements for planning, budgeting, scheduling, cost accounting, work authorization, measuring progress, and management control. The WBS must be extended to the level necessary for management action and control based on the complexity of the work. Each item in the WBS is assigned a unique identifier. These identifiers can provide a structure for a hierarchical summation of costs and resources. A WBS dictionary defines the work scope for each element in the WBS.

Typical Attributes:

- Only one WBS is used per project and it contains all project work including revisions for authorized changes and modifications.
- WBS contains all contract line items and end items.
- WBS identifies all WBS elements specified for external reporting.
- WBS is extended at a minimum to the control account level.
- WBS elements include a complete definition of work scope requirements.
- WBS will evolve as the project requirements change.

Objective evidence may be found in these typical outputs:

- Work breakdown structure (WBS).
- WBS dictionary (may or may not be used, but a method to reconcile the statement of work to the WBS structure must be demonstrated).

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Company or Organization Name EARNED VALUE MANAGEMENT SYSTEM PROCESS DESCRIPTION COMPLIANCE TO THE ANSI/EIA 748 STANDARD
2.1 Organization b) Identify the program 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.
Intent Guideline 2 Assign organizational responsibility for the project work. An OBS is used to facilitate the assignment of responsibility, accountability, and authority for all WBS tasks to be performed. An OBS is a direct representation of the hierarchy and description of the organizations established to provide resources to plan and perform the work tasks. The OBS identifies the organization responsible for each segment of work, including subcontracted and intra-organizational effort. The assignment of lower-level work segments to responsible managers provides a key control point for management purposes. This is called the control account (CA). When effort is subcontracted, the applicable subcontractor is identified and related to the appropriate WBS element(s) and/or organization charged with acquiring the subcontracted item.
Typical Attributes: • All authorized work is assigned to organizational elements. • Organization elements are work teams, functions, or whatever organization units are used by the company for efficient execution of the program work efforts. • Major subcontractors are integrated into the program structure. **Objective evidence may be found in these typical outputs:** • Organization breakdown structure (OBS). • OBS intersection with the WBS.
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Company or Organization Name EARNED VALUE MANAGEMENT SYSTEM PROCESS DESCRIPTION COMPLIANCE TO THE ANSI/EIA 748 STANDARD
2.1 Organization c) Provide for the integration of the company's 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.
Intent Guideline 3 Integrate the technical, schedule, and cost elements of the project through detailed, intermediate and summary project plans that include schedules, budgets, authorization of work, and accumulation of costs consistent with the budget plan. The work tasks are assigned to a WBS and OBS and are traceable to the scheduling system and the cost collection system. Establishment of control accounts at the intersection of the WBS and OBS facilitates the linkage between the planning, scheduling, budgeting, work authorization, cost accumulation, and performance measurement processes. The control accounts should be determined by the scope of the management tasks.
Typical Attributes Provide a logical framework that links the products of the management processes through common data elements. For example a cross-reference between the statement of work and the WBS, schedules tasks and performance measurement tasks, detail schedules and control account plans. **Objective evidence may be found in these typical outputs:** • Master, intermediate, and detail level schedules. • Manufacturing requirements planning (MRP) or enterprise requirements planning (ERP) operational schedules. • Control account plans. • Performance reports by WBS and OBS. • Responsibility assignment matrix (RAM). • Statement of work. • Work authorization. • WBS and OBS.
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Company or Organization Name
EARNED VALUE MANAGEMENT SYSTEM
PROCESS DESCRIPTION COMPLIANCE TO THE ANSI/EIA 748 STANDARD

2.1 Organization

d) Identify the company organization or function responsible for controlling overhead (indirect costs).

Intent Guideline 4

Clearly identify managers who are assigned responsibility and authority for controlling indirect costs including overhead, burden, and general administrative (G&A) costs, and have the authority to approve expenditure of resources. Document the process for management and control of indirect costs.

Typical Attributes:

- Indirect account structure and organizational assignment/authority level are clearly defined.
- Documented process clearly defines:
  - How overhead resources are assigned, budgets are established, and expense is controlled;
  - Who is responsible within the organization for establishing overhead budgets and their authorities.

Objective evidence may be found in these typical outputs:

- Cost accounting standards (CAS) disclosure statement.
- Organizational chart.
- Chart of accounts.

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2.1 Organization

e) 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.

Intent Guideline 5

Integrate the WBS and OBS to facilitate schedule and cost performance measurement.

The control account is the point where the WBS tasks and OBS responsibility intersect. It is defined as the point where a single functional organization or integrated product team has responsibility for work defined to a single WBS element. It is also the initiation point for work authorization, performance management, and performance measurement. The control account identifies the plan for work task accomplishment, includes a definition of the effort required, identifies element of cost (labor, material, etc.) and identifies the resources required to do the job. Each control account is assigned a control account manager. The control account manager is responsible for ensuring the accomplishment of work in his or her control account and is the focal point for management control.

Typical Attributes:

- Single control account is visible at the intersection of the WBS and OBS.
- Control account clearly identifies any supporting activities.
- The performance elements of cost are evident.

Objective evidence may be found in these typical outputs:

- Control accounts.
- Responsibility assignment matrix (RAM).

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Company or Organization Name
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PROCESS DESCRIPTION COMPLIANCE TO THE ANSI/EIA 748 STANDARD

2.2 Planning, Scheduling, and Budgeting

a) 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.

Intent Guideline 6

The scheduling process documents and the resulting project schedule provides a logical sequence of work leading to a milestone, event, and/or decision point, to ensure that the schedule supports the project objectives. There is a clear definition of what constitutes commencement and completion of a task. The schedule describes the sequence of discrete authorized work and their significant task interdependencies. Government development programs typically schedule the discrete authorized work through the use of a network. Production programs typically schedule using an MRP or ERP tool employing a line of balance schedule that supports the project objectives.

The master schedule must agree with the project objectives, include all key events, and reflect a logical sequence of events. It is essential for monitoring progress, analyzing variances, and tracking corrective actions to ensure that all team members are working to the same project schedule.

Schedules add a timeline to the project plan to accomplish the technical scope, allow managers to evaluate actual progress against the established baseline, and to forecast completion dates for remaining work. No specific scheduling software is required, but there must be horizontal and vertical integration through the framework of the WBS and OBS.

Typical Attributes:

An integrated network scheduling system has the following characteristics:

- Distinct tasks that can be summarized by WBS/OBS identifiers to track progress and measure performance.
- The schedule reflects all the time phased discrete work to be accomplished that is traceable to the WBS and the statement of work.
- Critical target dates, project milestones, contractual events, accomplishment criteria, and project decision points are identified and are being used to plan, status, and monitor progress of the work.
- The schedule describes the sequence of work through use of the significant interdependencies that are indicative of the actual way the work is accomplished and link key detail tasks with summary activities and milestones.
- Task durations and estimates are meaningful and are relatively short (short duration tasks are preferred and should be reflective of the ability to manage).
- Longer tasks need objective interim measures to enable accurate performance assessments.
- Resource estimates from the budget plan are reasonable and are available to support the schedule.

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- The baseline is reasonable to achieve project requirements as demonstrated through schedule analysis techniques.
- The baseline schedule is the basis for measuring performance.
- The schedule provides current status and forecasts of completion dates for all discrete authorized work.
- The schedule network relationships can support the development of a critical path for development projects.

Objective evidence may be found in these typical outputs:

- Integrated schedules including master, intermediate (if any), and detailed schedules.
- MRP or ERP schedules, or planned order reports.
- Control account plans which are detail schedules.
- Work authorization documents.

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2.2 Planning, Scheduling, and Budgeting

b) Identify physical products, milestones, technical performance goals, or other indicators that will be used to measure progress.

Intent Guideline 7

Identify objective interim measures within tasks to enable accurate performance assessment each month. The master schedule includes key program and contractual requirements. It enables the team to predict when milestones, events, and program decision points can be expected to occur. In a development environment, lower tier schedules must contain specific task start and finish dates that are based on physical accomplishment and are clearly integrated with program time constraints. These tasks will align with the objective interim measures within long work packages to enable accurate performance assessment. A sufficient number of interim measures will be defined after the detailed schedule is established to ensure performance is measured as accurately as possible. Interim measures will be based on the completion criteria developed for each increment of work to provide a basis for objectivity, limiting the subjectivity of work accomplished. Accurate schedule status depends on the selection of objective measures of progress to indicate work completion. These measures are necessary to substantiate technical achievement against the schedule plan and justify progression to the next task. A key feature of an interdependent schedule is that it establishes and maintains the relationship between technical achievement and progress statusing.

Typical Attributes:

- Objective completion criteria are determined in advance and used to measure progress to determine achievement of milestones or other indicators.
- Interim milestones and lower tier tasks serve as indicators of progress against which progress is monitored by the control account manager.

Objective evidence may be found in these typical outputs:

- Integrated schedules including master, intermediate (if any), and detailed schedules.
- MRP or ERP production planned order reports.
- Control account plans (may be separate plans or detail schedules).

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2.2 Planning, Scheduling, and Budgeting

c) 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. On government contracts, if an over-target baseline is used for performance measurement reporting purposes, prior notification must be provided to the customer.

Intent Guideline 8

The assignment of budgets to scheduled segments of work produces a plan against which actual performance can be compared. This is called the performance measurement baseline (PMB). The establishment, maintenance, and use of the PMB are indispensable to effective performance measurement. The PMB should be in place as early as possible after project award or authorization to proceed (ATP). The relationship of individual work tasks with the time-phased resources necessary to accomplish them is established at the control account level. Control accounts should be planned, at least at a summary planning level, to the end of the contract. Any control accounts that cannot be established in the initial planning effort have the critical defining event(s) necessary for planning identified and made an item of continuing management interest.

The PMB is a vehicle for comparison of work accomplished with work scheduled, and actual cost with value of work performed. The PMB includes direct hours/dollars, direct material dollars, other direct charges, and any indirect costs for all authorized work. The PMB represents the formal plan of each control account manager to accomplish all the work assigned in the amount of time allotted and within the amount of budget authorized.

When it is clearly impractical to plan authorized work in control accounts, budget and work will be identified to higher WBS or organizational levels for subdivision into control accounts at the earliest opportunity. The budget for this effort must be identified specifically to the work for which it is intended, be time-phased, its value periodically assessed, and controls established to ensure this budget is not used in performance of other work. The maintenance of realistic budgets, directly tied to an established scope of work, is essential for each organization responsible for performing project effort. Eventually, all the work will be planned by specific organizational elements to the control account level.

Planning horizons can be used to establish reasonable control account level assignments of work and budget. Summary level planning packages may be utilized until the information needed for detail planning becomes available. When that information is available, the detail work packages are planned as far in advance as practicable and planning packages are identified for the remaining work. Work should not commence until an initial detail plan is put in place. For authorized, unpriced work, the contractor will plan and budget near-term effort in control accounts, with the remaining effort and budget planned in summary level planning packages or

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maintained in undistributed budget (UB). Until definitization, the contractor will continually plan the near term work. After definitization, any budget remaining in undistributed budget will be planned and budgeted within control accounts as soon as practical.

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 total budget allocated to work to exceed the recognized contract budget base (CBB). The resulting value is referred to as an over-target baseline (OTB). Establishment of an over-target baseline may entail replanning future work, replanning in-process work, and/or adjusting variances (cost, schedule or both). This allows the project to increase the amount of budget for the remaining work to a more realistic amount to adequately provide for reasonable budget objectives, work control, and performance measurement.

A thorough analysis of contract status is necessary before the implementation of an over-target baseline. The contractor must perform a detailed estimate of all costs necessary to complete the remaining effort. If the difference between the estimated cost to complete and the remaining budget is significant, the contractor will give advance notification to the appropriate parties of the need to increase the remaining budgets. It is important to ensure that both internal management and the customer have a common understanding of the over-target baseline's impact on the performance metrics.

When the contractor and customer project managers are satisfied that the new baseline represents a reasonable plan for completing the contract, the new baseline becomes the basis for future performance measurement.

Typical Attributes:

- PMB reflects the work scope, time phased consistent with the integrated schedule.
- PMB reflects the budget value for the work scope in control accounts and higher level summary planning accounts.
- Control account budgets reflect the planned resources to perform the requirements and can exceed the contract budget base when an over-target baseline is employed.

Objective evidence may be found in these typical outputs:

- Control account plans.
- Summary level planning packages.
- Performance measurement baseline.
- Undistributed budget logs.
- Customer notification of an over-target baseline.
- Work authorization document.

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2.2 Planning, Scheduling, and Budgeting

d) Establish budgets for authorized work with identification of significant cost elements (labor, material, etc.) as needed for internal management and for control of subcontractors.

Intent Guideline 9

Through a work authorization process, establish budgets for all authorized work and identify the work to be done by the responsible organizational elements. Budgets and schedules are established and approved for all the authorized work at the control account level. The control accounts identify the appropriate cost elements (labor, subcontract, material, and other direct costs). It is important to include all resources required to accomplish the work scope.

Since control account budgets and schedules also establish the constraints required for baseline control, care must be exercised in the establishment of control account budgets to ensure a viable scope/effort correlation and prevent inadvertent front-loading of the baseline. When establishing control accounts, factors to consider include the:

- Natural flow of work at this management control point;
- Significant contract events that will be supported by completion of the effort within the control account;
- Need to ensure objective measurement of progress by establishing shorter assessment periods;
- Rate structures to be applied to the control account resources.

Each control account contains resources necessary to complete the assigned effort and budgets reflecting these resources. Budgets established at the control account level must be planned by element of cost. In addition:

1. Budgets may be stated either in dollars, hours or other measurable units.
2. It is necessary to use rates that will provide a valid performance measurement baseline.
3. In general, the budget process provides for the following:
    a. Direct budgets allocated to organizations performing the planned work;
    b. Indirect budgets allocated to specific organizations having responsibility for controlling indirect costs;
    c. Identification of any management reserves or undistributed budget.

Typical Attributes:

- Internal reports. Show budgets for each control account and that these budgets are reconcilable to the budget values shown on the latest control account/work package plans and in the work authorization documents.
- Control account/work package plans. Budgets are identified by element of cost (i.e., direct labor dollars/hours, material and/or subcontract dollars, and other direct costs).
- Responsibility assignment matrix (dollarized). Represents the complete project plan and budget. The budget is based on detailed estimates of the amounts of labor, materials, and

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other resources required to complete each task.

- Resource plan. Identifies the resources needed to accomplish the project and assigning resources to tasks listed in the integrated master schedule.
- Internal reports. Identifies control account budgets that can be summarized to organizational elements. Differentiation is made between direct cost budgets and those which include indirect costs.

Objective evidence may be found in these typical outputs:

- Control account plans by element of cost.
- Work authorization documents.
- Performance measurement baseline.
- Undistributed budget logs.
- Bills of materials (BOM).
- Responsibility assignment matrix (dollarized).
- Resourced schedules if resourced.
- Resource plan if resources not contained in the control account plans.

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2.2 Planning, Scheduling, and Budgeting

e) 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 effort in larger planning packages for budget and scheduling purposes.

Intent Guideline 10

Effort contained within a control account is distributed into either work packages or planning packages. Work packages are single tasks assigned to a performing organization for completion, and should be natural subdivisions of control account effort resulting in a definable end product or event. Work package descriptions must clearly distinguish one work package effort from another. A key feature from the standpoint of evaluating accomplishment is the desirability of having work packages that incorporate frequent, objective indicators of progress. When work packages are relatively short, little or no assessment of work-in-progress is required. As work package length increases, work-in-process measurement becomes more subjective, unless objective techniques, such as discrete milestones with preassigned budget values or completion percentages, subdivide them.

Each work package will have the following characteristics:

- It represents units of work at the level where work is performed.
- It is clearly distinguishable from all other work packages.
- It is assigned to a single organizational element, or in an integrated product team environment, there could be a single integrated product team responsible with multiple functional disciplines performing the scope of work.
- It has scheduled start and completion dates and, as applicable, interim milestones, all of which are representative of physical accomplishment.
- It has a budget or assigned value expressed in terms of dollars, labor hours, or measurable units.
- Its duration is limited to a relatively short span of time. Longer tasks need objective interim measures to enable accurate performance assessments, or it is level of effort (LOE).
- It is integrated with detailed engineering, manufacturing, or other schedules.

Work for a given control account that cannot be planned in detail at the outset, will be divided into larger segments and placed into planning packages within the control account. Planning packages are aggregates of future tasks and budgets, beyond the detail plan, that will be divided into work packages at the earliest practical point in time. Time-phased budgets assigned to planning packages must be supported by a specified scope of work and this relationship must be maintained when detailed planning of the effort occurs.

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Typical Attributes:

- Control account plans (CAPs) represent the work assigned to one responsible organizational element on one program WBS element. This is the lowest level in the structure at which the comparison of actual costs to planned budgets and earned value are required. It is also the cost collection point that identifies the cost elements and factors contributing to cost and/or schedule variances.
- Work packages represent detailed jobs, or material items. They are units of work at levels where work is performed and are clearly distinguishable from all other work packages. They are assigned to a single organizational element; have scheduled start and completion dates and, as applicable, interim milestones; have a budget or assigned value expressed in terms of dollars, labor hours, or other measurable units; duration is limited to a relatively short span of time, or it is subdivided by discrete value milestones to facilitate the objective measurement techniques of work performed, or it is LOE; and is integrated with detailed engineering, manufacturing, or other schedules.
- A planning package is the logical aggregation of work within a control account, normally the far-term effort, that can be identified and budgeted in early baseline planning, but can not yet be defined into discrete, apportioned, or level of effort work packages. Planning package plans must reflect the manner in which the work is to be performed.

Objective evidence may be found in these typical outputs:

- Control account plans divided into work packages and planning packages.
- Control account schedules when used.
- Control account time phased budgets.

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Company or Organization Name EARNED VALUE MANAGEMENT SYSTEM PROCESS DESCRIPTION COMPLIANCE TO THE ANSI/EIA 748 STANDARD
2.2 Planning, Scheduling, and Budgeting f) Provide that the sum of all work package budgets plus planning package budgets within a control account equals the control account budget.
Intent Guideline 11 All control accounts must contain a budget, schedule, and scope of work and should realistically represent the work assigned and budgeted to the organizational units. In all cases, the value of the budget assigned to individual work packages and planning packages within the control account must sum to the total value authorized for the control account. At no time should a control account manager have a budget with no assigned scope of work.
Typical Attributes: Control account plans (CAPs) represent the work assigned to one responsible organizational element on one program work breakdown structure element; the lowest level in the structure at which the comparison of actual costs to planned budgets and earned value are required; the cost collection point that will identify the cost elements and factors contributing to cost and/or schedule performance. **Objective evidence may be found in these typical outputs:** • Control account plan total budget. • Work package budget. • Planning package budget.
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2.2 Planning, Scheduling, and Budgeting

g) Identify and control level of effort activity by time-phased budgets established for this purpose. Only that effort which is unmeasurable or for which measurement is impracticable may be classified as level of effort.

Intent Guideline 12

Each task on the project needs to be assessed using the best method to budget and measure its progress toward completion. Level of effort is defined as having no measurable output or product at the work package level. Level of effort must be limited to those activities that are unable to be measured discretely to avoid distorting project performance data. Level of effort work packages should be separately identified from discrete effort work packages and apportioned effort work packages. Budgets for level of effort activity must have a sound basis of estimate and be time phased to properly reflect when work will be accomplished.

Typical Attributes

Level of effort work packages contain tasks of a general or supportive nature which do not produce definite end products, must be separately evaluated from discrete work packages within the control account, and contain time-phased budgets for planning and control.

- The amount of LOE activity will vary among performing organizations, but it must be held to the lowest practical level.
- Level of effort budgets should be separately substantiated and planned as direct labor, material/subcontract, or other direct costs. Level of effort should be budgeted on a time-phased basis for control and reporting purposes.
- When level of effort and discrete work packages are mixed within the same control account, the control account manager must ensure visibility into the earned value technique for measuring performance of the discrete effort.
- The earned value for level of effort work packages equals the time phased budget.

Objective evidence may be found in these typical outputs:

- Control account plans identify level of effort work packages and budgets.

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2.2 Planning, Scheduling, and Budgeting

h) Establish overhead budgets for each significant organizational component of the company 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.

Intent Guideline 13

Establish indirect (overhead, burden, and G&A expense) budgets at the appropriate organizational level for each pool and sub-cost element. It is important to have an indirect budgeting and forecasting process, because indirect costs account for a major portion of the cost of any project. As such, the budgetary control and management of this category of cost cannot be overlooked or minimized. Indirect budgets on the project are established and planned with the established direct budgets consistent with the contractor's accounting procedures.

Typical Attributes:

- Organization charts are generally contained within the contractor's system description identifying personnel or organizations responsible for maintaining indirect costs.
- Contractor's overhead policies and procedures are generally described in the contractor's system description and represent a rational, traceable process.
- Cost accounting standards (CAS) established by the Cost Accounting Standards Board (CASB), ensures consistent and proper accounting for direct and indirect costs that are applied to government contracts; direct costs are any cost that may be identified specifically with a particular cost objective; indirect costs are costs which, because of their incurrence for common or joint objectives, are not readily subject to treatment as direct costs.
- CAS disclosure statement defines the content and processes of the contractor's management of indirect costs and generally includes a definition of indirect expenses and overhead pools.
- Forward pricing forecasts identify projected overhead rates beyond current year.

Objective evidence may be found in these typical outputs:

- Documented process for managing indirect costs.
- Organizational structure identifying ownership responsibility and authority levels.
- Indirect cost policies and procedures.
- Chart of accounts.
- Organizational charts.
- Forward pricing forecast (including sales forecast and business base projections).
- CAS disclosure statement, if applicable.
- Indirect budget and performance reports.

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Company or Organization Name EARNED VALUE MANAGEMENT SYSTEM PROCESS DESCRIPTION COMPLIANCE TO THE ANSI/EIA 748 STANDARD
2.2 Planning, Scheduling, and Budgeting i) Identify management reserves and undistributed budget.
Intent Guideline 14 Identify and control management reserve (MR) and undistributed budget. Management reserve is budget for work scope that will arise during the course of the project, but cannot be identified in advance. Because management reserve is budget that is not as yet tied to work, it does not form part of the performance measurement baseline. The management reserve budget should be commensurate with the level of risks identified by the project and/or withheld for management control purposes. Undistributed budget is budget that is applicable to specific project effort but has not yet been distributed to control accounts. It is a transient amount; because once it is distributed it ceases to be undistributed budget and instead is incorporated in its relevant control account. Because undistributed budget is budget that is tied to work, it does form part of the performance measurement baseline. Undistributed budget accounts are to be cleared in a reasonably timely manner. Undistributed budget accounts are to be assigned to the performance measurement baseline when the work is established in the performance measurement baseline, normally within 90 days and prior to work starting. It is recognized that some circumstances, such as delays in contract direction will impact the timely assignment of undistributed budget to work packages.

Typical Attributes:
• Program control logs including:
  o Management reserve (showing month end values; monthly sources and uses to the control account; and current value).
  o Undistributed budget (showing month end values; monthly sources and uses to the control account; current value).
  o Performance measurement baseline (showing month end values; monthly changes from/to management reserve and undistributed budget; current value).
  o Contract budget base (showing month end values; monthly changes identifying contract modifications; current value).
• Monthly performance reports to verify starting and ending values are consistent with various logs.
Objective evidence may be found in these typical outputs:
• Project control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base).
• Contract performance reports (CPRs), if applicable.

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2.2 Planning, Scheduling, and Budgeting

j) Provide that the program target cost goal is reconciled with the sum of all internal program budgets and management reserves.

Intent Guideline 15

Reconcile the project value (target cost plus authorized, unpriced work) with the sum of all control account budgets, indirect budgets, management reserves, and undistributed budgets.

Typical Attributes:

- Program control logs including:
  - Management reserve (showing month end values; monthly sources and uses to the control account; current value).
  - Undistributed budget (showing month end values; monthly sources and uses to the control account; current value).
  - Performance measurement baseline (showing month end values; monthly changes from/to management reserve and undistributed budget; current value).
  - Contract budget base (showing month end values; monthly changes identifying contract modifications; current value) reconciled to program target cost.
- Contract and modification control logs identifying authorized target cost.

Objective evidence may be found in these typical outputs:

- Project control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base) reconciled to project target cost.
- Contract performance reports (CPRs), if applicable.
- Internal report showing the summarization from cost account to the performance measurement baseline.

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2.3 Accounting Considerations

a) Record direct costs in a manner consistent with the budgets in a formal system controlled by the general books of account.

Intent Guideline 16

Accumulate direct costs in the formal accounting system in a manner consistent with the way the related work is planned and budgeted. Actual cost reported in the performance reports agrees with the costs recorded in the general books of account (accounting system) or can be explained as timing differences.

Timing differences that may occur between accounting system and project performance reports must be reconcilable.

Of particular interest is the accounting for material (at consumption, receipt, inventory acceptance, or inventory release). The basic requirement is to account for materials in a manner consistent with the way in which materials are budgeted.

Typical Attributes:

- Contractor's accounting manual/procedures identifying the methodology of handling various actual costs.
- Contractor's cost accounting standards disclosure statement identifying treatment of direct costs (direct material, labor, and other direct costs), indirect costs, depreciation and capitalization, and other costs and credits.
- Control account actual costs/general ledger reconciliation.
- Contractor's process to ensure actual costs and performance are recorded in the same accounting period.

Objective evidence may be found in these typical outputs:

- Reconciliation of project costs with the accounting system.
- Actual costs are reported at the control account level at a minimum.

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2.3 Accounting Considerations

b) 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.

Intent Guideline 17

A work order/job order/task code charge number structure must exist that uniquely identifies costs down to the control account level allowing for accumulation and summarization of costs to higher levels. Allowable costs collected within the control account by element of expense "roll-up" from the control account level through the WBS to the top level without being divided at any level among two or more higher-level elements. Cost collection accounts map to the WBS, and the WBS roll-up structure contains no division/allocation of lower-level cost to multiple higher-level WBS elements. When common costs are collected in separate control accounts for like items or services they are allocated to appropriate control accounts in each project.

Typical Attributes:

- Cost collection account structure showing charge number hierarchy.
- WBS structure (roll-up scheme) showing hierarchy of WBS elements, control accounts, and work packages.
- WBS/cost collection mapping showing the relationship between charge numbers and control accounts and/or work packages.
- The program established cost charging structure will ensure that actual costs are collected so that direct comparison with associated budgets can be made at the appropriate WBS level(s).

Objective evidence may be found in these typical outputs:

- Cost collection account structure.
- WBS/cost collection mapping.
- WBS structure (roll-up scheme).
- Monthly performance report.

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2.3 Accounting Considerations

c) Summarize direct costs from the control accounts into the contractor's organizational elements without allocation of a single control account to two or more organizational elements.

Intent Guideline 18

Allowable costs collected within the control account by element of expense "roll-up" from the control account level through the OBS to the top level without being divided at any level among two or more higher-level elements. This guideline and the one before it are identical, with the exception that this one deals with OBS data summarization while the previous one dealt with WBS data summarization. In either case the intent is the same: actual cost collected at the control account level may not be rolled up (i.e., summarized) to multiple higher-level elements. When common costs are collected in separate control accounts for like items or services they are allocated to appropriate control accounts in each project.

Typical Attributes:

- Organization charts showing the contractor's organizational hierarchal structure.
- Responsibility assignment matrix showing the intersection of OBS organizations and WBS elements, which is the control account.
- OBS structure (roll-up scheme) showing the relationship of charge numbers to the OBS.
- The program established cost charging structure will ensure that actual costs are collected so that direct comparison with associated budgets can be made at the appropriate organizational level(s).

Objective evidence may be found in these typical outputs:

- Responsibility assignment matrix.
- Organization charts.
- OBS structure (roll-up scheme).
- Contract performance report (format 2 where required).

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2.3 Accounting Considerations d) Record all indirect costs which will be allocated to the project.
Intent Guideline 19 Record all indirect costs for the project in the accounting system. Allocate them to the recorded direct costs per the documented procedure to assure that all projects benefiting from the indirect costs will receive their fair share.
Typical Attributes: • Cost collection account structure. Identifies the chargeable object for all cost centers. • WBS/cost collection mapping. Identifies the responsible organization for budgeting and controlling indirect cost, time-phased budgets/forecast established at same level as cost collection for comparison. • WBS structure (roll-up scheme). Hierarchy scheme from point of allocation to WBS/OBS to total program level. • Cost accounting standards disclosure statement. Identifies the allocation base and indirect cost pools by function element of cost. • Accounting procedures showing the responsible organization for incurring indirect cost corresponds to the level of management control and categorizes fixed and variable cost methods of control. • Organization chart. Identifies management responsibility for controlling indirect staff and ability to influence indirect costs. **Objective evidence may be found in these typical outputs:** • Cost collection account structure. • WBS/cost collection mapping. • WBS structure (roll-up scheme). • Cost accounting standards disclosure statement.
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2.3 Accounting Considerations e) Identify unit costs, equivalent unit costs, or lot costs when needed.
Intent Guideline 20 Identify unit costs, equivalent unit costs, or lot costs when needed. Where the work is budgeted by unit, equivalent units, or lot costs, as appropriate for the work being planned, ensure that the accounting system produces actual unit, equivalent unit, or lot costs for purposes of measuring cost performance to plan. When units are taken off the line in more or less a random order according to the delivery agreements of the different customers' projects, it is sufficient to establish "equivalent unit cost" (i.e., all things being equal, on a "mature" production run, each unit's cost is approximately equivalent to every other unit's cost).
Typical Attributes: • Manufacturing requirements planning (MRP) project cost collection structure. • Enterprise requirements planning (ERP) supports the identification of unit costs, equivalent unit costs, or lot cost when needed including differentiation of work in process. Expressed in terms of labor, material, other direct cost, indirect cost, as well as distinguishing between recurring (e.g. production) and non-recurring (e.g. design, development, travel and expense) costs. **Objective evidence may be found in these typical outputs:** • Project cost collection structure (MRP). • ERP system supports the identification of unit costs, equivalent unit costs, or lot costs when needed including differentiation of work in process.
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2.3 Accounting Considerations

f) 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 performance measurement at the point in time most suitable for the category of material involved, but no earlier than the time of progress payments or actual receipt of material.
3) Full accountability of all material purchased for the project including the residual inventory.

Intent Guideline 21

Material accounting systems must adhere to these three characteristics:

1. The material accounting system provides full accountability and effective performance measurement of all material (including residual inventory) purchased for the project.
2. Material costs must be accurately charged to control accounts using recognized, acceptable costing techniques (e.g. performance recorded at receipt of material for high dollar material, or when material will be used within the same accounting period, material usage, or release to work in process that is consistent with the planned budget in the same accounting period that performance is claimed).
3. When necessary, the use of estimated actual costs to ensure accurate performance measurement is required.

Typical Attributes:

- Performance reports showing material cost/schedule variances, earned value claimed in same accounting period of actual cost, material performance recorded no earlier than material receipt, issue from inventory, or material consumption.
- Control account plans showing time-phased material budgets, earned value technique, high/low material.
- The material system needs to account for various methods of charging material cost from inventory in accordance with cost accounting standards inventory costing methods, i.e., first in first out (FIFO), moving average, weighted average, standard cost, and last in first out (LIFO). Identify accountability for all material purchased for the program including material issues to control accounts, return of unused material, scrap quantity and disposition, and residual inventory.

Objective evidence may be found in these typical outputs:

- Performance reports.
- Control account plans.
- Material system reports.

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2.4 Analysis and Management Reports

a) 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:
   1) Comparison of the amount of planned budget and the amount of budget earned for work accomplished. This comparison provides the schedule variance.
   2) 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.

Intent Guideline 22

On at least a monthly basis, generate schedule variance and cost variance data that provide visibility into root causes and establish actions to achieve project completion. Accurate and reliable EVMS data supports management control needs by allowing the project manager to focus on those areas in need of attention. The first intent of this criterion is to establish the fact that analysis, to remain viable, must be accomplished on a regular, periodic basis. The second intent is to foster analyses and identification of root cause and resulting impacts at the control account level. Since the control account is normally the lowest level at which management and control responsibility exists for specific WBS increments of work, it is the logical point for not only the planning, scheduling, budgeting, and accounting efforts but also for the analysis effort as well. All data analyzed must be from, or be reconcilable with, the accounting system.

In order for control account manager's to have full management control responsibility, they must be able to analyze the work performance and associated costs against the performance measurement baseline. Since the control account is the level at which performance measurement is performed, the project manager must, as a minimum, ensure traceability of project performance down to the control account. However, analysis should be performed at the most meaningful level of the WBS, which may be determined by risk, critical path, technical performance metrics, or utilization of thresholds.

Typical Attributes:

- Monthly performance report:
  - Budget, earned value, and actual costs (reconcilable with accounting system);
  - Cost variance (CV);
  - Schedule variance (SV);
  - Variance at completion (VAR);
  - Variance analysis narrative (root causes, impacts at completion, and management actions);
- Summarized performance measurement data from control account (minimum) through WBS/OBS hierarchy to the program level.

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Objective evidence may be found in these typical outputs: • Monthly performance report (cost variance, schedule variance, and variance at completion analysis). • Variance analysis data (root causes, impacts at completion, and management actions).
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2.4 Analysis and Management Reports

b) 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.

Intent Guideline 23

The purpose of this guideline is to ensure both a time-based schedule management analysis of significant scheduling differences and a budget based cost management analysis of significant performance management baseline variances occurs.

Comparing the budget value of work completed to the budget value of work scheduled during a given period of time provides a valuable indication of schedule status in terms of dollars worth of work accomplished. This schedule variance (SV) may not, however, clearly indicate whether or not scheduled milestones are being met, since some work may have been performed out of sequence or ahead of schedule. Schedule variance does not indicate whether a completed activity is a critical event or if delays in an activity's completion will affect the completion date of the project.

A formal time-phased scheduling system, therefore, must provide the means of determining the status of specific activities, milestones, and critical events. Schedule analysis must address the time impact to the schedule plan when a significant variance exists. By addressing the time impact for each significant variance a true and representative impact to the schedule plan is quantified. A key concept required to support schedule analysis is to ensure that work is planned in discrete elements that reflect actual accomplishment. This ensures time-based schedule variances are ultimately reported. The analysis should identify potential schedule accomplishment and milestone problems.

Typical Attributes:

- Schedule (time-based) and cost (budget based) variances are identified at an actionable level.
- Cause and impact are identified in sufficient detail needed for project management.
- Corrective actions are assessed in a timely manner.

Objective evidence may be found in these typical outputs:

- Variance analyses (budget based schedule variances and cost variances).
- Management action plans.
- Updated schedule task completion and cost at completion forecasts.
- Project schedules and schedule analysis outputs.

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2.4 Analysis and Management Reports

c) 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.

Intent Guideline 24

Indirect rate forecast and control is crucial to meeting project cost objectives. This guideline requires a monthly indirect analysis, at the level of assigned responsibility, comparing indirect budgets to indirect actual costs (with the stipulation that the cause of resultant variance be explained). The importance of analyzing indirect performance requires the exercise of maximum discipline in following indirect procedures.

Typical Attributes:

- Indirect variance analyses:
  - Budget to actual comparison by element of cost from management control point up through WBS/OBS to project level;
  - Variance thresholds by overhead category;
  - Responsible overhead manager identifies root cause (i.e. usage variance, change in business volume, or rate variance due to a change in direct base).
- Indirect management action plans:
  - Corrective action plans identified to reduce or eliminate variance;
  - Performance metrics.

Objective evidence may be found in these typical outputs:

- Indirect variance analyses.
- Indirect management action plans.
- Indirect updated schedule and cost forecasts.

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2.4 Analysis and Management Reports d) 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.
Intent Guideline 25 Use the same data for internal management needs and for reporting to the customer. Since the WBS and the OBS exist as a formal and disciplined framework for a comprehensive roll-up of all data elements, they become the ideal framework for summarizing data from the control account level to the management reporting level.
Typical Attributes: • Variance analyses. Internal/external reporting thresholds and narrative analysis providing root cause, impact, corrective action. • Schedule and cost performance reports. Schedule variance, cost variance, variance at complete from control account up through WBS/OBS reporting structure hierarchy to total program level. • Management action plans. Corrective action plan/mitigation plan, task, milestones, exit criteria, schedules. **Objective evidence may be found in these typical outputs:** • Variance analyses. • Schedule and cost performance reports. • Management action plans. • Updated schedule and cost forecasts.
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Company or Organization Name EARNED VALUE MANAGEMENT SYSTEM PROCESS DESCRIPTION COMPLIANCE TO THE ANSI/EIA 748 STANDARD
2.4 Analysis and Management Reports e) Implement managerial action taken as the result of earned value information.
Intent Guideline 26 Assess management actions and modify them as required to achieve project objectives. Earned value data must be utilized by all levels of management for effective project execution. Because of this, the data produced by the earned value management system must be available to managers on a timely basis and must be of sufficient quality to ensure that effective management decisions can be made as a result of its analysis. The project's internal reports and the reports forwarded to their customer must indicate the overall cost and schedule impacts of such problems on the project.
Typical Attributes: • Follow-up of the implementation to see if what was planned actually got implemented. • Reasonableness of the corrective action. • Validity of the problem identified. **Objective evidence may be found in these typical outputs:** • To complete performance index (TCPI). • Independent completion estimates. • Risk management data and similar metrics. • Management action plans and review briefings. • Variance analyses.
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2.4 Analysis and Management Reports

f) 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.

Intent Guideline 27

On a monthly basis, the control account manager should review the status of the expended effort and the achievability of the forecast and significant changes briefed to program management. A comprehensive EAC is accomplished on a periodic basis using all available information to arrive at the best possible estimate at completion. This is done by:

a. Evaluating performance to date efficiency achieved by performing organizations for completed work and comparing it to remaining budgets;

b. Assessing commitment values for material to complete the remaining work;

c. Estimating future conditions to derive the most accurate estimate at completion.

Comparisons of this estimate to budgets for the associated effort must be made frequently enough for management to ensure project performance and resource availability will not be adversely impacted. Prudent maintenance of the control account level EAC by the control account manager ensures that the EAC reflects a valid projection of project costs.

Typical Attributes:

- Timely and comprehensive assessments of the effort required for completing all work packages and planning packages in the control account plan.
- Control account manager updates the EAC to reflect changes in budget and/or integrated master schedule when there is material significance.
- Time-phased ETC based on an analysis of remaining tasks in the integrated master schedule and projected resource plan.
- Control account manager should generate the EAC at the work package and planning package level and then sort and summarize by WBS and OBS to the control account level.
- Contract performance report totals for the EAC should reconcile with the corresponding time-phased resource plan.
- EACs should consider all emerging risks and opportunities within the project's risk register (or other similar database) which will impact the integrated master schedule and resource plan for the remainder of the work.
- EAC results are communicated to the customer in internal reports and in funding documents.

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Objective evidence may be found in these typical outputs: • Control account plans. • Basis of estimates. • Risk management plans (identification, mitigation, and opportunities). • Operational metrics. • Earned value metrics. • Estimates at completion. • Material and subcontractor performance data.
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2.5 Revisions and Data Maintenance

a) Incorporate authorized changes in a timely manner, recording the effects of such changes in the budgets and schedules. In the directed effort prior to negotiation of a change, base such revisions on the amount estimated and budgeted to the program organizations.

Intent Guideline 28

Incorporate the work scope for authorized changes into the performance measurement baseline in a documented, disciplined, and timely manner. Adherence to this guideline ensures that budget, schedule, and work remain coupled. For unpriced change orders, the contractor will develop its best estimate for planning and budgeting purposes for incorporation into the performance measurement baseline. Incorporating changes will not arbitrarily eliminate existing cost and schedule variances. Rate changes and economic price adjustments may also be made as appropriate.

Typical Attributes:

- Contractual change documents (external). May take various forms, (e.g., contract modification, letter to proceed from contracts or legal, not to exceed letter, change order, engineering change order, delivery order, basic ordering agreement, etc.) which transmit and authorize the change or addition to work, budget, and schedule.
- Contractor's internal earned value management system documentation (e.g., change request form, program directive, etc.) facilitating the change. It should provide the rationale/justification, approval process, work scope additions or deletions by integrated product team or WBS, dollars, changes to schedules, estimate at completion, etc.).
- Basis of estimate (if not yet negotiated).
- Change control logs including management reserve justification, dollar amount and receiving WBS; undistributed budget justification, dollar amount and receiving WBS; performance measurement baseline dollar amount; and contract budget base total.
- Statement of work (amendments or revisions), WBS (changes if applicable), and WBS dictionary (additions and/or deletions to scope).
- Work authorization documents authorizing new work scope, schedule, budget and authorization to proceed, if not already captured by the internal change request process.
- Control account/work package/planning package plans showing revised work scope, duration, and budget.
- Master schedules, intermediate schedules (if any), and detailed schedules showing revised work scope and duration, changes to linkages, etc.
- Management reports (contract performance reports or other applicable management reports) showing timely incorporation of new work scope.

Objective evidence may be found in these typical outputs:

- Contractual change documents.
- Change control logs (management reserve, undistributed budget, performance

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measurement baseline, and contract budget base). • Control account/work package/planning package plans. • Master schedules, intermediate schedules (if any), and detailed schedules. • Statement of work, WBS, and WBS dictionary. • Work authorization documents. • Management reports (contract performance reports or other applicable management reports).
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2.5 Revisions and Data Maintenance b) 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.
Intent Guideline 29 Budget changes are controlled and understood in terms of scope, resources, and schedule. Budget reflects current levels of authorized work. Budget revisions are traceable to authorized contractual targets and control account budgets. Management reserve may be used for future unopened work when additional in scope work has been identified and replanning actions cannot be handled within the existing budgets and schedule constraints of the control accounts.
Typical Attributes: • Contractual change documents (external). May take various forms, (e.g., contract modification, letter to proceed from contracts or legal, not to exceed letter, change order, engineering change order, delivery order, basic ordering agreement, etc.) which transmit and authorize the change or addition to work, budget and schedule. • Contractor's internal earned value management system documentation (e.g., change request form, program directive, etc.) facilitating the change. It should provide the rationale/justification, approval process, work scope additions or deletions by integrated product team or WBS, dollars, changes to schedules, estimate at completion, etc.) . • Basis of estimate (if not yet negotiated). • Change control logs including management reserve justification, dollar amount and receiving WBS; undistributed budget justification, dollar amount and receiving WBS; performance measurement baseline dollar amount; and contract budget base total. • Statement of work (amendments or revisions), WBS (changes if applicable), and WBS dictionary (additions and/or deletions to scope). • Work authorization documents authorizing new work scope, schedule, budget and authorization to proceed, if not already captured by the internal change request process. • Control account/work package/planning package plans showing revised work scope, duration, and budget. • Master schedules, intermediate schedules (if any), and detailed schedules showing revised work scope and duration, changes revised work scope and duration, changes to linkages, etc. • Management reports (contract performance reports or other applicable management reports) showing timely incorporation of new work scope. **Objective evidence may be found in these typical outputs:** • Contractual change documents. • Change control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base).

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2.5 Revisions and Data Maintenance

c) 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.

Intent Guideline 30

Control retroactive adjustments (including those in the current period) to costs, making only routine accounting adjustments (e.g. definitization of unpriced change orders, rate changes, and economic price adjustments), customer-directed changes, or data entry corrections. This is necessary to ensure baseline integrity and accuracy of performance measurement data. Retroactive budget adjustments may delay visibility of overall project variance from plan, thus reducing the alternatives available to managers for project redirection or termination.

Typical Attributes:

- Change control process defines policy regarding retroactive changes that include conditions for use or prohibitions, approvals and justifications, and evidence of discipline and control.
- Change control logs record change activity.
- Review the current dollarized time-phased baseline plan. Compare it to the previous period baseline plan to identify any differences and to verify all changes have been identified.
- Scheduling system reflects schedule inputs concerning times, dates, durations, percentage complete, etc.
- Negative journal entries. When not a result of error corrections or routine accounting adjustments, they have appropriate explanations.
- Earned value input source documents. Negative or inappropriate amounts must have appropriate explanations.
- Management reports. Current period data on format 1 and format 3 of contract performance report will reflect any retroactive changes and format 5 for related explanations.

Objective evidence may be found in these typical outputs:

- Change control logs.
- Retroactive change control process including approval.

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2.5 Revisions and Data Maintenance

d) Prevent revisions to the program budget except for authorized changes.

Intent Guideline 31

Prevent unauthorized revisions to the performance measurement baseline. Any changes to the project must be approved and implemented following the baseline management control process. This control precludes the inadvertent implementation of a budget baseline greater than the project budget. When the performance budget or schedule objectives exceed the project plan and are recognized in the performance measurement baseline, it is identified as an over-target baseline.

Typical Attributes:

- Change control logs reflect changes to the performance measurement baseline or contract budget base.
- Control account/work package/planning package plans reflect approved budget changes.
- Work authorization documents reflect authorized changes to budget.
- Time-phased budget "run" reflects authorized changes to the budget.
- Management reports (contract performance reports or other applicable management reports) reflect changes to the contract budget base or additions on formats 1, 2, 3, and 5 of the contract performance report if required.

Objective evidence may be found in these typical outputs:

- Change control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base).
- Control account/work package/planning package plans.
- Master schedules, intermediate schedules (if any), and detailed schedules.
- Statement of work, WBS, and WBS dictionary.
- Work authorization documents.
- Management reports (contract performance reports or other applicable management reports).

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2.5 Revisions and Data Maintenance

e) Document changes to the performance measurement baseline.

Intent Guideline 32

The performance measurement baseline should always reflect the most current plan for accomplishing the effort. Authorized changes must be quickly recorded in the system and incorporated into all relevant planning. Planning and authorization documents must be updated accordingly prior to the commencement of new work.

Typical Attributes:

- Change control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base) reflect changes from the original contract budget base.
- Control account/work package/planning package plans reflect updated schedule and budget plans for all authorized changes.
- Master schedules, intermediate schedules (if any), and detailed schedules reflect incorporation of latest authorized changes.
- Time-phased budget "run" reflects authorized changes to the budget.
- Statement of work, WBS, and WBS dictionary. Review for incorporation of all authorized changes.
- Work authorization documents reflect incorporation of all authorized changes.
- Management reports (contract performance reports or other applicable management reports) reflect incorporation of all authorized changes.

Objective evidence may be found in these typical outputs:

- Change control logs (management reserve, undistributed budget, performance measurement baseline, and contract budget base).
- Control account/work package/planning package plans.
- Master schedules, intermediate schedules (if any), and detailed schedules.
- Statement of work, WBS, and WBS Dictionary.
- Work authorization documents.
- Management reports (contract performance reports or other applicable management reports).

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