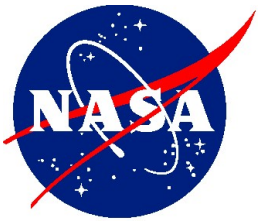

Earned Value Management (EVM) Implementation Handbook

National Aeronautics and Space Administration
NASA Headquarters
Washington, D.C. 20546

April 2026

Electronic copies are available from

NASA STI Program:
http://www.sti.nasa.gov

NASA EVM Website (Public)
nasa.gov/evm

NASA STI Information Desk
Email to: help@sti.nasa.gov/
(757) 864-9658

Write to:
NASA STI Information Desk
Mail Stop 148
NASA LaRC
Hampton, VA 23681-2199

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RECORD OF REVISIONS		
REV LTR	**DESCRIPTION**	**DATE**
	Basic Issue	February 15, 2013
1	Revised to include Integrated Program Management Report (IPMR) which replaced the CPR and IMS on new contracts per PIC 15-06, Guidance on the Integrated Program Management Report for Earned Value Management (April 28, 2015), new reference number and title for the EVMS standard EIA-748, EVMS threshold changes per PCD 15-05, Class Deviation to NFS 1834.2, 1834.203-70, 1852.234-1 and 1852.234-2 – Earned Value Management System Threshold (November 10, 2015), NASA HQ Memorandum for the Record: "MSC Approval of Budget BSA Decision #6 Memo: Raise EVM Thresholds to $250M" dated December 11, 2017, NASA surveillance process.	January 26, 2018
2	Revised to include SMD Class-D EVMS Deviation, update links, update EVMS thresholds matrix chart, include submission of EVM reports to the NASA EVM central repository, delete Special Publications numbers from documents, update DCMA compliance procedures references, update NASA EVM Surveillance process as appropriate, include internal hyperlinks, etc.	November 2019
3	Revised to remove NASA EVM Surveillance process (now in own plan), update for DCMA compliance procedure references, and minor copy edits.	November 2021
4	Revised to include Integrated Program Management Data and Analysis Report (IPMDAR) which replaced the IPMR and IMS on new contracts per PIC 23-02, Guidance on the Integrated Program Management Data and Analysis Report for Earned Value Management (July 20, 2023)	February 2024
5	Revised to include the updates to the FAR overhaul, NFS (PCD 25-05A) and NFS Part 1834 Companion Guide. Updates to NASA.gov/EVM links to OCFO PP&C Corner.	April 2026

P PREFACE

P.1 Purpose

The purpose of this handbook is to provide Earned Value Management (EVM) guidance for the effective application, implementation, and utilization of EVM on NASA programs, projects, major contracts, and subcontracts. EVM is a project management process that effectively integrates a project's scope of work with schedule and cost elements for optimum project planning and control. The goal is to achieve timely and accurate quantification of progress that will facilitate management by exception and enable early visibility into the nature and the magnitude of technical, cost and schedule problems. EVM also enables managers to monitor the intended course and success of corrective actions.

The following key components of NASA's EVM policy are addressed in this handbook:

- EVM implementation on NASA contracts
- EVM implementation on NASA In-house programs/projects
- EVM System (EVMS) acceptance and surveillance processes

The handbook addresses the application of EVM to NASA projects that meet the threshold for implementing EVM. The project effort may be primarily contract, In-house, or a combination of both. Refer to the NASA EVM System Description located on EVM Working Group Community site on NASA Teams for detailed information on implementation of the EVM capability processes, procedures, roles and responsibilities when EVM is required for NASA projects.

This handbook serves as the central EVM guidance document for NASA personnel. The handbook is included in the document hierarchy (Figure P-1) along with the following complementary handbooks:

- NASA Space Flight Program and Project Management Handbook
- NASA Project Planning and Control Handbook
- NASA Schedule Management Handbook
- NASA Work Breakdown Structure (WBS) Handbook
- NASA Integrated Baseline Review (IBR) Handbook
- NASA EVM System Description (latest revision).

The dashed line indicates guidance and instruction rather than policy and procedures as contained in the NASA Directives and Procedures. Throughout this document, references are made to additional sources of information, such as EVMS standards, requirements, and websites. These additional sources should be consulted as appropriate. While not a special publication, find the NASA EVM Agency Surveillance Plan on the EVM Working Group Community site (internal only) on Teams.

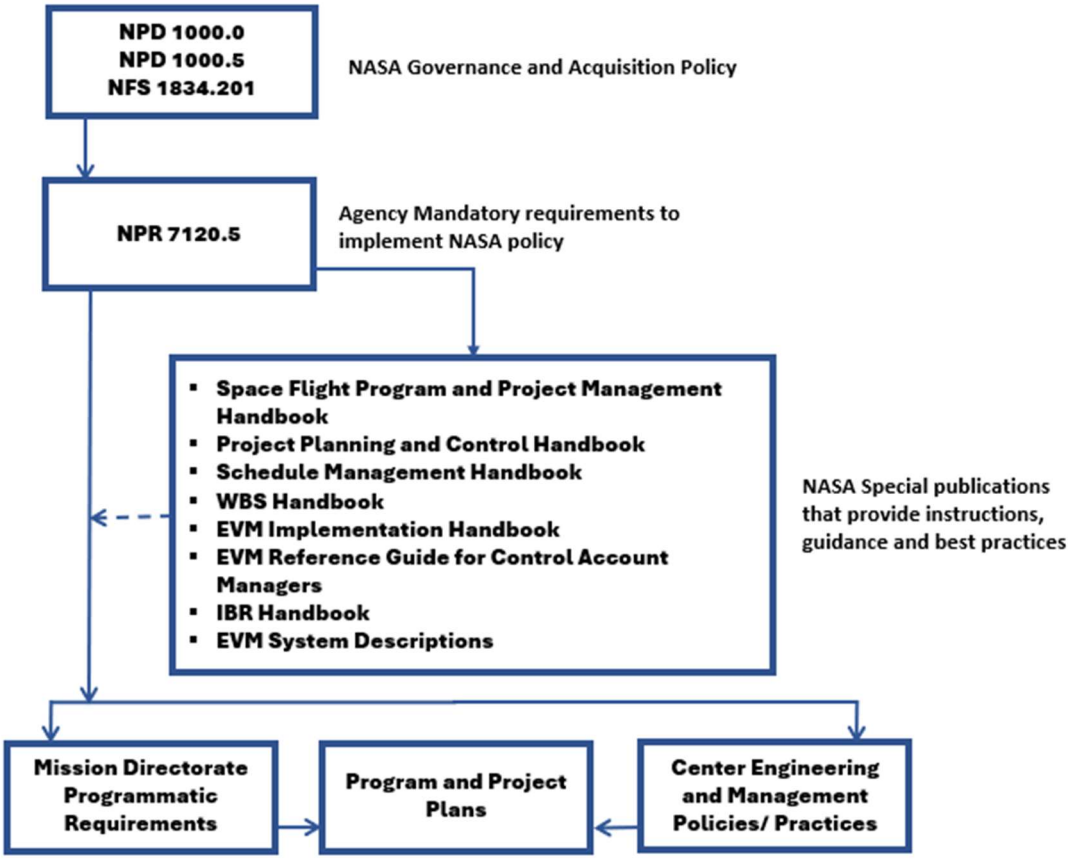

Figure 0-1 NASA Program/Project Management Requirement Hierarchy

This handbook will be updated as needed to enhance efficient and effective EVM implementation across the Agency. The NASA EVM Website, https://www.nasa.gov/ocfo/ppc-corner/evm/, consists of publicly available NASA EVM related policy and requirements, handbooks, links to other websites, etc.

P.2 Applicability

This handbook provides EVM guidance for NASA Headquarters and NASA Centers.

P.3 Authority

- NASA Federal Acquisition Regulation Supplement (NFS) 1834.201, Earned Value Management System Policy
- NASA FAR Supplement Companion Guide
- NASA Policy Directive (NPD) 1000.0, NASA Governance and Strategic Management Handbook
- NPD 1000.5, Policy for NASA Acquisition
- NPD 7120.4, NASA Engineering and Program/Project Management Policy
- NASA Procedural Requirements (NPR) 7120.5, NASA Space Flight Program and Project Management Requirements
- NPR 7120.8, NASA Research and Technology Program and Project Management Requirements

P.4 References

All NASA EVM related handbooks and guides can be found at the NASA EVM website (https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks) unless otherwise noted.

- NASA Procurement Class Deviation (PCD) 25-05A, Class Deviation from NASA FAR Supplement (NFS) Part 1834 to Implement the Revolutionary FAR Overhaul (RFO)
- NASA Space Flight Program and Project Management Handbook
- NASA Schedule Management Handbook
- NASA Work Breakdown Structure (WBS) Handbook
- NASA Integrated Baseline Review (IBR) Handbook
- NASA EVM Reference Guide for Control Account Managers
- NASA Integrated Program Management Data Analysis Report (IPMDAR) Data Requirements Description (DRD) Guide
- Earned Value Management Systems, Electronic Industries Alliance (EIA)-748, Current Release (EIA-748 EVMS Standard)
- Office of Management and Budget (OMB) Circular A-11, Part 7, Planning, Budgeting, Acquisition and Management of Capital Assets; and the Capital Programming Guide (https://www.whitehouse.gov/omb/information-for-agencies/circulars/)
- OMB Procurement Memo entitled Reducing the Burden of Certifying Earned Value Management Systems, Oct 23, 2015
- NASA/FAA Reciprocity MOU entitled Memorandum of Understanding Concerning Reciprocal Recognition of a Supplier's Earned Value Management System, October 23, 2015.
- Defense Contract Management Agency (DCMA) EVMS Business Practices at https://www.dcma.mil/HQ/EVMS/
- Department of Defense (DoD) Earned Value Management System Interpretation Guide (EVMSIG) and DoD Earned Value Management Implementation Guide (EVMIG) (current revision) at https://acqnotes.com/acqnote/tasks/dod-earned-value-management-guide
- Government Accountability Office (GAO), GAO Cost Estimating and Assessment Guide, GAO-20-195G, https://www.gao.gov/products/gao-20-195g
- National Defense Industrial Association (NDIA) Integrated Program Management Division (IPMD), Earned Value Management Systems Intent Guide, (current version), https://www.ndia.org/divisions/ipmd/division-guides-and-resources (Note: The following NDIA IPMD Guides are also located at this site)
- NDIA IPMD Earned Value Management Systems Application Guide (current version)
- NDIA IPMD Earned Value Management System Acceptance Guide (current version)
- NDIA IPMD Surveillance Guide (current version)
- NDIA IPMD Earned Value Management System Guideline Scalability Guide (current version)
- NDIA IPMD A Guide for Managing Programs Using Predictive Measures (current revision)

P.5 Terminology Context

This handbook includes implementations across all NASA centers. NASA EVM policy not only applies to contractors, but to NASA projects, including In-house activities. Some terms will be consolidated but it is important for the reader to understand the differences.

- The term "customer" is the organization buying the product or service and is usually the NASA Mission Directorate, program, or project. The term "contract" may be interpreted to apply to both contracts with industry to include universities as well as agreements with NASA projects and with intra-agency activities that meet the reporting thresholds unless specifically noted.
- The term "supplier" is the organization that is the source for the products or services. Suppliers can be an In-house project office or another NASA Center where the MD or program office is located.

P.6 Point of Contact

Primary point of contact for this handbook is NASA's EVM Program Executive (PE) who serves as chair of the EVM Working Group (EVMWG). NASA EVM Focal Points (FP) may also be consulted for assistance with this handbook. The EVMWG Chair and a listing of applicable EVM FPs is located on the NASA EVM website at https://www.nasa.gov/ocfo/ppc-corner/evm/evmwg/.

1 EVM REQUIREMENTS

1.1 Background

The OMB Circular A-11 and supplement, Capital Programming Guide, set forth the policy, guidance, budget justification, and reporting requirements that apply to all agencies that are subject to Executive Branch review for major capital asset acquisitions. A-11 requires that an EVMS be applied on major acquisitions for developmental efforts for both government and contractor work and that the EVMS be consistent with the guidelines in the Electronic Industries Alliance (EIA)-748 Earned Value Management Systems. While a Project Plan or Intra-Agency Work Agreement replaces the contract for NASA In-house work, the other requirements for good project management, including the use of an EVMS that complies with the EIA-748 Standard, are applicable for developmental efforts.

NASA has an agency-wide EVM capability to facilitate compliance with OMB EVM requirements and provide for the effective and consistent implementation of EVM across NASA programs/projects. The NASA EVM capability consists of processes and procedures documented in the NASA EVM System Description, selected tools, and training. NASA's EVM capability can be found on the EVM Working Group Community Site on Teams. Use of EVM will ensure projects meet their EVM requirements. Project Plans should include their EVM implementation approach, milestones, and use. See APPENDIX E: of this handbook for more information.

1.2 Policy and Requirements for the Application of EVM

Projects subject to NASA's EVM requirements must use an EVMS compliant with the EIA-748 standard. The NASA FAR Supplement, updated in June 2025, raised the contract minimum from $20M to $50M. Class-D missions with an LCC of up to $150M (not including launch costs) should use the processes per the SMD Class-D Tailoring/Streamlining Policy. For details go to https://www.nasa.gov/ocfo/ppc-corner/evm/regulations/.

EVM is required when initial LCC will be $250M or greater as per NPR 7120.5 (current version). EVM requirements for projects that fall under $250M threshold at KDP-B, but exhibit cost growth, will be re-assessed at KPD-C. If the LCC costs are expected to be $250M or greater, then EVM is required.

Additional information is located at https://www.nasa.gov/ocfo/ppc-corner/evm/regulations. An overview of the NASA EVM requirements criteria is provided below (**Error! Reference source not found.**).

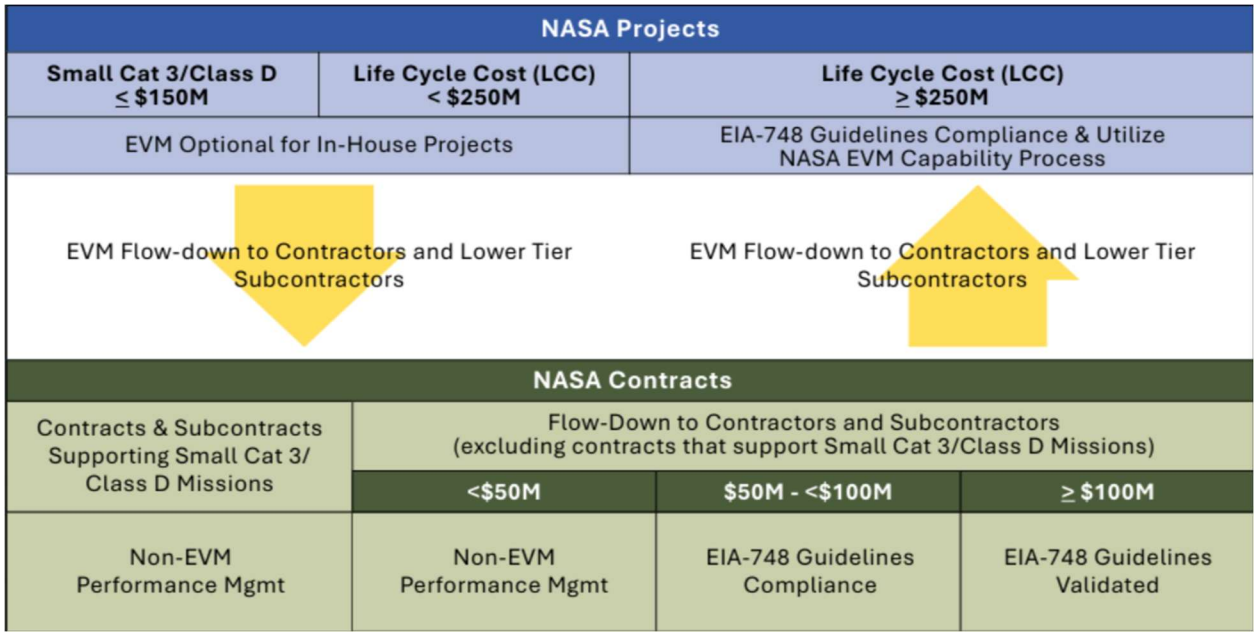

Figure 1-1 NASA EVM Requirements

The figure above illustrates the current thresholds, which will be applied differently depending upon whether the project is new or already underway, namely:

- On new projects, EVM is required when initial LCC is estimated to be $250M or greater at or prior to Key Decision Point B (KDP B). Note: EVM requirements for projects that fall under $250M threshold at KDP B, but exhibit cost growth, will be reassessed at KDP C. If the LCC is expected to be $250M or greater, then EVM is required.

Although EVM is optional on In-house work for new projects with an LCC less than $250M pre-KDP B, this does not preclude Mission Directorates, Centers, Programs or Projects from implementing EVM if decided to do so based on risk.

Contracts follow requirements outlined in the NFS (PCD 25-05A) and NASA Far Supplement Companion Guide, which are located at https://www.nasa.gov/ocfo/ppc-corner/evm/regulations/. Cost or fixed price incentive fee contracts with development scope of $50M (total estimated contract value) or greater will require EVM compliance with the EIA-748 determined by the Contracting Officer (CO). Contracts of $100M (total estimated contract value) or greater and SMD Mission Risk Class-D space flight contracts greater than $100M will require EVM compliance with the EIA-748 using an EVMS that is accepted by the Agency or designee (e.g., Defense Contract Management Agency (DCMA)). The NASA EVM Contract Requirements Checklist summarizes the EVM application and reporting requirements for contracts and subcontracts and is located on the NASA EVM website at https://www.nasa.gov/ocfo/ppc-corner/evm/regulations/.

The following examples are provided for EVM application clarification:

Example 1: A new project that consists of $100M of In-house work and $150M of contract(s) requires EVM. The $250M or greater threshold is at the project level with contract thresholds set by the NFS as described in the previous paragraph.

Example 2: In Phase A, a new project with an LCC is estimated at $230M. If after the LCC estimate, the costs incurred through Phase A and into Phase B exhibit cost growth that indicate the project may exceed the $250M LCC threshold, then the project should prepare to implement EVM. EVM implementation begins with planning during early Formulation (Phases A and B). Each applicable project describes the specific use of the Agency EVM Capability in the Project Plan. Figure 1-1 shows the relationship between the EVM requirements and the NASA project life cycle phases, key events/reviews, and significant EVM related program planning and control activities during each phase.

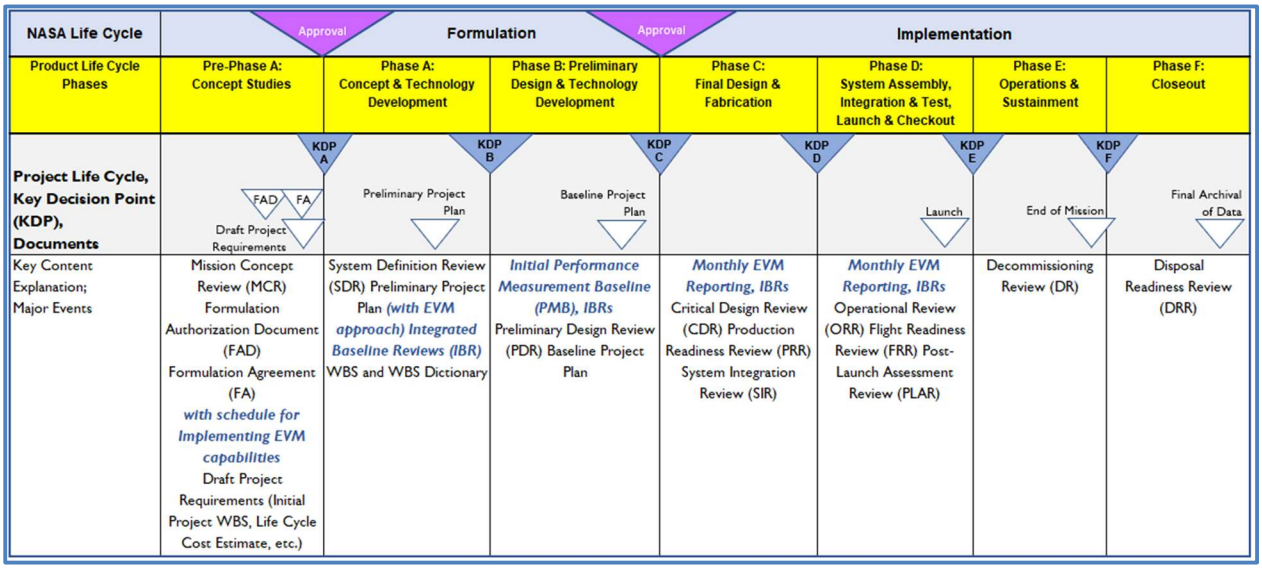

Figure 1-1 NASA Life Cycle

Projects use the NASA EVM Capability System Description to document and coordinate with their respective Center EVM Focal Point (FP), the project-specific customization when developing their EVM Implementation Plans. Each project flows down EVMS requirements to its applicable suppliers (intra-agency organizations and contractors). See APPENDIX A: for an example of key pre- and post-contract award activities and Appendix B for an example of EVMS scope paragraphs to be included in solicitations. In addition to submitting monthly EVM reports to the Program/Sponsor as required, Projects should submit their EVM monthly reports to the NASA central repository (see Tools section below).

The project's preliminary Performance Measurement Baseline (PMB) is established in Phase B in preparation for KDP C approval and the Integrated Baseline Review (IBR) process. The IBR is conducted by the Mission Directorates as part of their preparations for KDP C to ensure the project's work is properly linked with its cost, schedule and risk and the systems are in place to conduct project level EVM. See Section 3.7 of this handbook for more information.

1.3 NASA EVM Tools of Record

Project Managers should work with their Center EVM FP to identify appropriate analytical methodologies and tools. NASA provides Deltek Cobra as the Earned Value (EV) cost tool and Encore Analytics' Empower for EVM analysis and reporting that meet the requirements outlined

in NPR 7120.5 and EIA-748. Empower supports analysis and reporting through the capability of importing and exporting a multitude of file types, most importantly being IPMR, and IPMDAR Schedule Performance Data (SPD) and Cost Performance Data (CPD) files. It also performs data validity checks to ensure reliability. All NASA projects with EVM requirements should use Empower for data validation, analysis, and reporting. Empower and Cobra are available through the Agency EVM Program Executive (PE). Instructions for acquiring access to these tools are available on the EVM Working Group Community Site on NASA MS Teams. While NASA establishes performance requirements and technical standards, the Agency does not mandate specific toolsets for data validation, analysis, and reporting that contractors must employ in contract execution.

For schedule assessment tools please refer to the https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks. NASA has selected SAP as the accounting tool of record and Windchill as the tool of record for the Central Repository.

2 ROLES AND RESPONSIBILITIES

2.1 Introduction

This section provides a brief description of the responsibilities typically assigned to project organizational roles involved with EVM implementation and maintenance. It should be recognized that the role definitions contained within this document do not contain a complete or detailed job description for each of the roles addressed. For additional roles and responsibilities, see the NASA EVM Capability System Description. Depending on the size of the project, some roles may be combined and served by a single individual or may not be required, such as, work package manager or task manager. EVM-related institutional roles and responsibilities are also included in the next section.

2.2 Project Manager (PM)

The PM has overall responsibility and accountability for the project's cost, schedule, and technical performance as designated by applicable policy, requirements, and authorizing documents. These responsibilities include but are not limited to the following functions:

- Recognizes and accepts responsibility and authority for the project. Provides overall management direction and oversight for the project.
- During early project formulation, establish the organization and key structures to facilitate effective EVM implementation and usage (e.g., Project Work Breakdown Structure (WBS), Organization Breakdown Structure (OBS), Responsibility Assignment Matrix (RAM), control accounts, etc.).
- Responsible for the overall integrity of the IMS and providing overall schedule guidance for the project.
- Ensures project schedule margin is reasonable and controlled.
- Approve Control Account (CA) documentation such as Work Authorization Documents (WAD), baseline change requests, Estimates at Completion (EAC), etc., for In-house EVM implementation as appropriate.
- Stipulate EVM data requirements for project and contract reporting, including formats and tools. NASA has tools of record (see Section 1.3) available for use in implementing In-house EVM and conducting EVM data analysis and reporting. Contact your EVM FP for support in obtaining access to such tools to include setting up your project or contract.
- Provide budget and staffing forecasts to functional managers to ensure availability of future resources.
- Ensure the monthly EVM reporting (IPMDAR or IPMR) is submitted to NASA's central repository for EVM data.
- Coordinate with and obtain concurrence from the respective Center EVM FP throughout the Request for Proposal (RFP) or Announcement of Opportunity development and proposal evaluation process to ensure EVM requirements are properly defined and appropriately tailored as appropriate. Participate in the evaluation of contractor proposals and EVM System Descriptions when required.
- Ensures proper allocation of EVM requirements to major Intra-Agency efforts.

- Coordinate with and obtain concurrence from the respective Center EVM FP throughout the development of project plans regarding implementation, maintenance, surveillance, and reviews of the project's EVMS.
- Submission of waiver and/or deviation requests for the project and/or contract's EVM requirements and include justification and rationale for the request. Documenting approved waivers in the Project Plan. See Section 4.10 for instructions on minimum waiver requirements for In-house EVM.
- Hold project personnel accountable for effective EVM implementation by incorporating appropriate standards in their performance evaluation plans.
- Implement a surveillance plan to ensure that EVM data is reliable as outlined in the Agency Surveillance Plan found on the EVM Working Group Community Site on Teams site.

2.3 Project Planning and Control (PP&C)

2.3.1 EVM Focal Point

In addition to the NASA EVM PE, each Mission Directorate, Mission Support Office and Center, should designate a representative as its EVM FP. A list of EVM FPs can be found on the NASA EVM website. The responsibilities of an EVM FP include but are not limited to the following functions:

- Serve as a representative on the Agency EVM FP Working Group (EVMWG).
- Serve as the EVM consultant and advisor to programs and projects in the implementation, application, and use of EVM.
- Serve as the EVM consultant in developing EVM policies, requirements, and guidance that are consistent with overall Agency requirements and policies.

2.3.2 Business Manager

Each project with EVM requirements should designate a Business Manager to assist the PM in the effective implementation and use of EVM on the project. The responsibilities of the Business Manager include but not be limited to the following functions:

- Provide supervision of the Resource Analyst, Planner/Scheduler, and EVM Analyst functions within a project.
- Ensure integration between the schedule and budget data.
- Assist the PM in managing and reporting project budget, cost, schedule, and performance data.
- Assist the PM in establishing and maintaining project cost and schedule baseline documents, WADs, and project budget logs.
- Submit approved monthly IPMDARs to sponsoring organizations, senior management and the NASA EVM central repository. Instructions for posting to the central repository can be found at EVM Working Group Community Site on Teams.
- Assist the PM with EVM Surveillance.

2.3.3 Earned Value Management Analyst

Each project with EVM requirements should designate an EVM Analyst. The responsibilities of the EVM Analyst include but are not limited to the functions described below. Note that the individual with these functions may have a different job title such as Resource Analyst or Planner/Scheduler. These functions should be assigned to an individual regardless of title.

- Develop the EVM Implementation Plan for the Project Plan (see APPENDIX E: for additional instructions).
- Assist the PM and the CO, where NASA policy requires the application of EVM on a NASA contract, to ensure the inclusion of EVM solicitation provisions to include applicable DRDs in the RFP and the use of EVM contract clauses.
- Serve on the SEB to evaluate the EVM aspects of contractor proposals.
- Facilitate project-related IBRs to include project manager led IBRs on contracts/agreements with EVM.
- Assist or provide project team in obtaining EVM training.
- Facilitate/participate in DCMA or NASA led contractor EVMS compliance/validation reviews and surveillance reviews as required.
- Facilitate the EVMS implementation, training, and tools; maintain the project budget logs; provide control account documentation to Control Account Manager (CAM); prepare the Project IPMDAR; assist CAMs in establishing and maintaining their control account plans and performance analysis.
- Perform data validity checks on monthly EVM In-house and contractor reporting to assess the reliability of EVM data to support overall project analysis and surveillance. Identify issues and monitor for satisfactory resolution.
- Analyze performance data and prepare EACs as required. Assist the PM and Business Manager with the annual comprehensive EAC to support the Program, Planning, Budgeting and Execution (PPBE) process.
- Participate in regular project risk meetings to ensure that risks are captured in the EAC and schedules, and to assess the adequacy of the Management Reserve (MR).
- Participate in change control boards to ensure that changes are incorporated into the PMB and EACs in a timely manner.

2.3.4 Resource Analyst

Each project with EVM requirements should designate a Resource Analyst. The responsibilities of the Resource Analyst should include but not be limited to the following functions:

- Assist in budget development and planning, resource planning, updating financial forecasts, and processing baseline change requests.
- Assist CAMs during planning to ensure budgets are planned in the same resource category that actual costs are expected.
- Assist responsible managers in verifying that actual cost data are applied to the correct charge numbers.
- Assist in the preparation and analysis of financial and performance reporting and input to the PPBE process.

2.3.5 Planner/Scheduler

Each project with EVM requirements should designate a Planner/Scheduler. The responsibilities of the Planner/Scheduler should include but not be limited to the following functions:

- Assist responsible managers in developing schedules, including cost integration.
- Maintain existing schedules by updating progress, performance, and other data as required to reflect both the current plan and the approved baseline.
- Ensure horizontal and vertical schedule integration.
- Assess schedule integrity and data validity of the IMS monthly using best practices and NASA approved tools. Identify issues; monitor to ensure satisfactory resolution.
- Assist in the preparation and analysis of schedule reporting and performance.

2.4 Control Account Manager

The CAM, subordinate to the PM and applicable policy, requirements, and authorizing documents, has overall responsibility for the cost, schedule, and technical performance of a scope of work represented by a WAD for a control account. These responsibilities include but are not limited to the following functions:

- Recognizes and accepts responsibility and authority for their WBS elements and establish the WBS Dictionary for their scope of work and identifies CAs through the development of the RAM
- Develop time-phased plan, that includes appropriate PMT assignments, for scope of work at a WP/PP level with PP&C support.
- Provides risk mitigation activities for incorporation into the IMS as well as, risk assessment parameters to support SRA.
- Ensure vertical and horizontal traceability is maintained with PP&C support.
- Establishing CA Basis of Estimates (BOE).
- Determines feasibility of Control Account Plans (CAP) by decomposing the CA into Work Packages (WP) and Planning Packages (PP); negotiates and approves CA Work Authorization Documents (WAD).
- Identifies subcontracted scope and ensures the scope, plans, and schedules are properly planned and integrated within the control account baseline ensuring appropriate flow down of EVM requirements to major contracts.
- Participates in proposal and EVMS evaluations when required. Reviews contractor plans and schedules for alignment with the control account plan.
- Identifies Intra-Agency work scope and ensures the scope, plans, and schedules are properly planned and integrated within the control account baseline ensuring appropriate flow down of EVM requirements to Intra-Agency Work Agreements.

2.5 Functional Manager

The Functional Manager is an individual responsible for the administration of a group of people with a specific skill set. Typical responsibilities for a Functional Manager include but are not limited to the following:

- Manage the allocation of a group of skilled resources across multiple projects or efforts in order to meet multiple priorities.
- Assist personnel in their professional advancement along their chosen career path by coordinating training and job assignments.
- Broker agreements with project management to engage the skilled resources necessary for project efforts in the time frame required.
- Ensure that core competencies and capabilities are established and maintained in the responsible functional area for future projects and efforts.

2.6 Contracting Officer

The CO has overall responsibility for negotiating and executing the contracts in accordance with the NFS and NASA procurement policy and procedures and ensures that the appropriate EVMS clauses and data requirements are included in major contracts.

3 EVM IMPLEMENTATION ON NASA CONTRACTS

3.1 Overview

This section addresses the key activities involved in effective contract planning and execution. Throughout the contract planning and acquisition process, the PM should coordinate with the NASA Center EVM FP for assistance in defining the appropriate EVM requirements for each contract and facilitate effective EVM implementation after contract award. APPENDIX A:, Example Contract EVMS Implementation Activities, provides a listing of relevant pre- and post-contract award activities and responsibilities to facilitate effective application and implementation of NASA contract EVMS requirements. *Be sure to take into account that EVM is applicable to development contracts in accordance with NFS 1834.201 based on the value, contract type, period of performance and nature of the work - not on the program/project phase.*

3.2 Activities before Contract Award

The PM, Business Manager, or EVM analyst initiates contact with the Center EVM FP to define EVM requirements early in the planning and development of the RFP or Announcement of Opportunity. By applying in-depth knowledge of the project and the proposed contract, the PM, the Business Manager or the EVM analyst, and the EVM FP can select the best approach to implementing EVM and reporting requirements on the particular contract. Information unique to the program/project can affect the type and level of EVM requirements included in the RFP and later invoked on the contract. Understanding the project and its associated risks allows greater insight into tailoring EVM requirements. The NASA EVM Contract Requirements Checklist, located at the NASA EVM website at https://www.nasa.gov/ocfo/ppc-corner/evm/regulations/, is a tool that the project team can use to ensure the EVM requirements are properly applied. To waive EVMS on applicable contracts, an NFS deviation is required and must be approved by the Office of Procurement or the CO. If an In-house project, then a waiver from the 7120.5 is required.

EVM FPs provide guidance before the contract award to ensure that the RFP and the awarded contract contain the appropriate EVM-related clauses and reporting requirements. Historically, many problems occurring during EVM implementation are directly related to inadequate definition of EVM requirements in the RFP.

The PM should ensure that the project personnel receive the appropriate training such as EVM, IBR, etc. The Center EVM FP can assist with this requirement.

3.3 Determine Contract Type

The contract type is a key element in determining EVM requirements. Contract types fall into two basic categories: Cost Reimbursable or Fixed Price. Variations of each of these two basic types exist. The particular contract structure should reflect the degree of risk assumed by the government. Definitions of common variations follow. Additional guidance can be found in FAR Part 16.

- Firm Fixed Price: The contract stipulates a fixed amount of compensation regardless of the actual cost (i.e., regardless of whether the contractor has experienced a cost overrun or a cost underrun). This contract is the lowest risk instrument for the contracting entity.
- Fixed Price Incentive Fee (FPIF): The contract stipulates a target cost, target fee, and a share ratio associated with any underrun or overrun to the target cost. The share ratio

establishes percentages that NASA and the contractor will share in the underrun or overrun. The contract will define the maximum and minimum fee.

- Cost Plus Incentive Fee: The contract allows cost reimbursement for all in-scope effort. The fee determination is similar to FPIF contracts but there is no ceiling price. The incentive fee may be based on cost, technical performance, or both.
- Cost Plus Award Fee (CPAF): The contract allows cost reimbursement for all in-scope effort. The award fee is used as an incentive to the contractor to perform to a predetermined set of criteria. An Award Fee Plan identifies the evaluation periods, the available award fee pool of dollars by period, and the award fee criteria to be used in evaluating the contractor's performance.
- Cost Plus Fixed Fee: The contract allows cost reimbursement for all in-scope effort. The contractor fee is fixed. The contractor is guaranteed that fee regardless of an underrun or overrun. This contract is the highest risk instrument for the contracting entity.

Since NASA projects use Incentive and Award Fee type contracts, the application of EVM in the award fee criteria is a valuable tool to promote good project management. However, the use of EVM indicators, such as the Cost Performance Index (CPI), or the Schedule Performance Index (SPI) are not recommended. EVM indicators are not always a true indicator of performance when considered out of context. Careful consideration should be given to choosing multiple indicators that are relatively easy to measure yet not easily distorted.

A recommended approach for EVM award fee criteria is to use qualitative measures such as:

- the contractor shall maintain a current and realistic EAC.
- the contractor shall provide effective and updated variance analysis
- risk management is used in cost control
- integration of subcontractor performance into the performance measurement baseline is current and accurate
- an EVM is effectively integrated and used for project management
- the EVMS remains fully complaint with the EIA-748 standards and produce reliable EVM information.

PMs are also discouraged from tying an award fee to an IBR event, especially the initial IBR. A lesson learned from NASA projects has shown that this can result in a hastily contrived, inaccurate, and inadequate "baseline," eventually leading to significant replanning. It may encourage the contractor to minimize the IBR event, be less forthcoming with data, and hold the event even if the contractor is not fully ready from a baseline perspective. An acceptable alternative would be specifying an award fee criterion such as, "Contractor must maintain a realistic and adequate baseline, and have it available for review by the government upon request."

3.3 Establish EVM Implementation Requirements

The NFS solicitation provisions and contract clauses should be used to provide notification of NASA's intent to implement EVM on contracts. NFS Parts 1834 and 1852 provide the respective NFS solicitation provisions and contract clauses required for the implementation of EVM on contracts. These provisions and clauses establish the requirements for contractors to propose an EVMS that is or will be validated by the government as being compliant with the EIA-748

guidelines. If a prospective contractor proposes to use an EVMS that has not been validated by the government, then the contractor is required to submit a plan for validation in accordance with NFS 1834.2 and 1852.234-1 and 1852.234-2. A contractor that has an EVMS validated by the government will normally propose to use this system. If so, the contractor will submit documented proof of their EVMS validation in accordance with the contract EVMS clause.

3.4 Specify EVM Reporting Requirements

The required contract reporting requirements are summarized in the NASA EVM Contract Requirements Checklist located on the NASA EVM website at https://www.nasa.gov/ocfo/ppc-corner/evm/regulations/. Contract reporting requirements are defined in specific Data Requirement Documents (DRD) included in the solicitation and contract. The EVM FP will work with the PM and the CO to ensure the DRDs are included and tailored as necessitated by the complexity of the contract and project management reporting requirements.

The Integrated Program Management Data and Analysis Report (IPMDAR) is the primary report the government uses for obtaining earned value and schedule data. The IPMDAR requirement should be added as a DRD for all contracts that have an EVM requirement. In accordance with NFS 1834.201, the appropriate solicitation provisions and contract clauses are to be used to implement EVM and IPMDAR reporting on these contracts.

The IPMDAR is used by the contractor to provide NASA with monthly cost, schedule, and technical performance information. The IPMDAR has up to seven (7) files:

- Contract Performance Dataset (CPD)
- Schedule Performance Dataset (SPD)
- IMS Data Dictionary
- IMS native file
- Performance Narrative Report
    - Executive Summary
    - Detailed Analysis Report for Required Elements
    - Detailed Analysis Report for Tailorable Elements

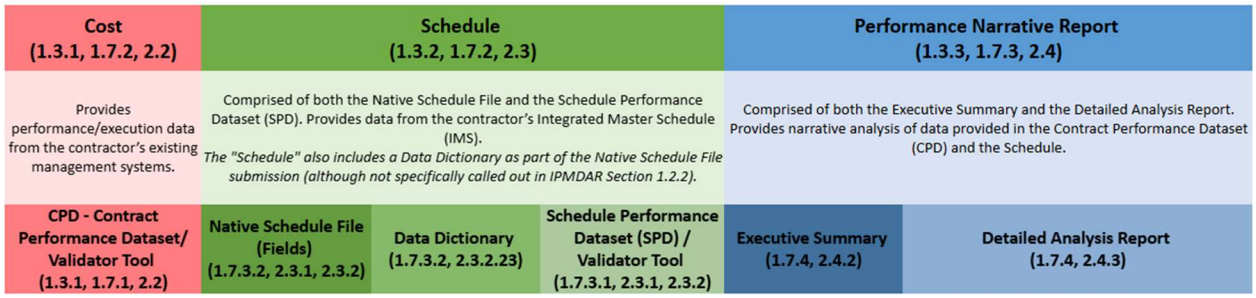

Figure 3-1 IPMDAR Products

The contract IPMDAR DRD provides guidance for the preparation and submission of the IPMDAR, files, variance analysis thresholds, reporting frequency, reporting levels, distribution, and specific project instructions if required. The Data Item Description, DI-MGMT-81861 (Rev

C is IPMDAR), "Integrated Program Management Data and Analysis Report," and located at https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=278901 and The Integrated Program Management Data Analysis Report (IPMDAR) Implementation & Tailoring Guide, 24 August 2021, located at (https://www.acq.osd.mil/asda/ae/ada/ipm/docs/IPMDAR%20Implementation%20and%20Tailoring%20Guide_Stamped.pdf), are two useful guides for the development and tailoring of the DRD for the IPMDAR.

3.5 Create a Work Breakdown Structure (WBS)

The project WBS provides the structure for technical planning, scheduling, cost estimating and budgeting, contract scope definition, work authorization, product development, status reporting and assessment. In other words, the WBS provides the framework for implementing EVM. The WBS should be a product-oriented hierarchical division of the hardware, software, services, and data required to produce the required deliverables. The WBS should also be consistent with current NASA requirements in NPR 7120.5. An example of a contract DRD for the WBS and WBS dictionary is provided in the NASA WBS Handbook located at https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks.

Normally, during the RFP stage, the solicitation will provide a contract WBS down to level three. The contractor will use this Contract WBS (CWBS) and extend it to the appropriate management level. The contractor may also propose changes to the CWBS. The NASA WBS Handbook provides recommended methods and best practices for developing the project and CWBS.

3.6 Determine Schedule Requirements

The RFP should include language that requires a logic network schedule and defines the logic network schedule requirements. These requirements should be consistent with NPR 7120.5 and satisfy the scheduling "best practices" included in the NASA Schedule Management Handbook located on the https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks. Requirements should ensure the establishment, management, and control of the baseline master schedule and its derivative schedules. These requirements help ensure establishment of a valid framework for time phasing budgets and coordination of efforts into a master plan that also enables the measurement of accomplishments. The IPMDAR contains instructions for preparing, maintaining and submission of the IMS, IMS Data Dictionary, and the SPD.

3.7 Include Integrated Baseline Review Requirements

When the contract clause, 1852.234-2 Earned Value Management System is included in the solicitation and contract, it notifies contractors that an IBR will be conducted. Providing additional information in the contract will ensure understanding of requirements and provide an opportunity for clarifications. Include this information in a contract Statement of Work (SOW) or a performance work statement. The SOW should require the contractor to demonstrate with evidence and to show all appropriate documentation to support proof of an executable baseline and direct contractors to NASA's IBR Handbook on the NASA EVM website (https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks) for guidance.

3.8 Include Management Review Requirements

Management reviews are typically held on a regular basis and involve government team members and contractors reviewing the work status. Guidance should be included in the contract SOW or performance work statement to describe the role and content of EVM in these reviews. The review includes such topics as cost, schedule, and technical performance. It should also include a quantified risk assessment with impacts and provide a means of identifying action items and ensuring that they are completed. As each manager presents, they should integrate the EVM data into the presentations to give an overall picture of cost, schedule, and technical performance.

3.9 Specify EVM Links to Risk Management

Effective EVM includes an integrated risk management process. Early planning during the RFP stage should include consideration in schedule and cost estimates for reasonable risks. Recognized risks that are not quantifiable should be considered when developing MR or Unallocated Future Expense (UFE). As the project advances in the lifecycle, linkage between the risks (recorded in the risk system) and project scope (reflected in the schedule and budget) are necessary to properly manage. The nature of this linkage should be defined during the early planning stages of RFP development.

3.10 Participate in the Source Evaluation Board (SEB)

During the SEB process, the Center EVM FP or EVM Analyst establishes DRDs and requirements and evaluates the offeror's responses. For example, in accordance with NFS EVMS Clause 1852.234-1, the offeror shall provide documentation that its proposed EVMS complies with the EVMS guidelines in the EIA-748 Standard for Earned Value Management Systems. If the offeror proposes to use a system that currently does not meet the requirements, the offeror shall submit its comprehensive plan for compliance with the EVMS guidelines to the government for approval. An EVMS expert must review these systems and plans for adequacy and recommend any changes to the selection board.

3.11 Activities after Contract Award

This section describes the EVMS compliance, validation, and maintenance following contract award for any contract requiring EVMS application.

3.11.1 Conduct EVMS Validation (Compliance Reviews)

Cost or Fixed Price Incentive contracts, task and delivery orders that have a period of performance of at least 18 months, contain developmental work scope and are $100M or greater require a validated EVMS by the government (unless there is an approved deviation such as for SMD Class-D discussed in Section 0 of this handbook). NASA has an overarching Memorandum of Understanding (MOU) with DCMA that describes the typical validation and surveillance responsibilities expected of DCMA when requested. Projects Managers and COs complete the NASA Form 1430A to delegate responsibility for validation and surveillance of contractor EVMS to the DCMA. The DCMA will review the contractor's plan for validation and provide NASA with a report regarding the plan's adequacy for the intended contract. When validation is necessary, the contractor is responsible for scheduling related reviews with the DCMA and NASA customer. The National Defense Industry Association's (NDIA) EVMS Intent Guide, the NDIA EVMS Acceptance Guide and the DoD EVMS Interpretation Guide (EVMSIG) provide additional

information on these reviews. NASA and the PM will provide specialists to augment the DCMA team as appropriate to accomplish these reviews. If a contract is awarded to a contractor and DCMA is not involved, the NASA PM will work with the NASA EVM PE for the appropriate validation approach. See APPENDIX C: of this handbook for more information.

Contracts, tasks, and delivery-orders greater than $50 million but less than $100 million are not required to have a formally validated EVMS, See NASA FAR Supplement Companion Guide. While no validation is required, the contractor is expected to comply with the requirements listed in EIA-748. The government (NASA PM with assistance from the applicable EVM FP) will evaluate the offeror's proposed EVM approach in the source selection evaluation process and determine/confirm compliance with the EIA-748 guidelines and perform surveillance to ensure continued compliance during the course of the contract.

3.11.2 Extend the Contract WBS

Extension of the Contract WBS (CWBS) will be done by the contractor after contract award to reflect the division of lower-level products and services and to describe how these contribute to the higher level products and services. The reporting of progress, performance, risks, and engineering evaluations, as well as financial data and variance analyses are based on the CWBS. For assistance in understanding the appropriate extension of the CWBS, refer to the NASA WBS Handbook at https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks.

3.11.3 Conduct Integrated Baseline Review

All contracts with EVM are required to have an IBR to finalize the agreement on the baseline and ensure all risks are identified and understood. The PM and responsible technical managers, with the support of the EVM FP, should conduct an IBR within 180 calendar days after contract, subcontract, or task order award, or the exercise of significant contract options as required by NFS 1852.234-2(c). This timeline applies to the authority to proceed on letter contract awards as well. The project phase is *not* a consideration. An IBR must also be conducted within 60 calendar days after distribution of a supplemental agreement that implements a significant funding realignment or effects a significant change in contractual requirements (e.g., incorporation of major modifications). The NASA IBR Handbook (https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks) provides further guidance on the IBR process.

The IBR is a valuable opportunity for the Customer and Supplier project to thoroughly review the planning of the scope, the schedule, the budget, and resource plans, and to evaluate potential risks/opportunities and other management processes with the baseline plan (the performance measurement baseline) and to take joint ownership. Finally, the IBR is also a means to establish a proactive, positive working relationship between the Customer and Supplier.

The IBR achieves an understanding of the baseline plan and how the project's Earned Value Management System (EVMS) will operate during the project life cycle. The objective is to gain insight into cost, schedule, technical, resource, and management process risk areas, as well as develop confidence in the project's operating plans, and identify any new risk/opportunities. This is accomplished by evaluating the PMB to ensure it captures the entire technical scope of work, is consistent with schedule requirements, has adequate budget/resources, and has sound management processes.

3.11.4 Implement Contractor EVMS Surveillance with DCMA

The Project Manager (PM) and Contracting Officer (CO) delegate EVMS surveillance to DCMA using NASA Form 1403A. Surveillance is performed by the responsible DCMA office with support from NASA project personnel as assigned by the PM. Responsibilities are defined in the NASA–DCMA Memorandum of Understanding (MOU), which covers EVMS surveillance at one or multiple contractor sites. The MOU includes compliance assessment, validation, and evaluation of previously validated EVMS systems, as well as roles, responsibilities, deliverables, and coordination methods for contract-specific surveillance.

The PM may delegate all or part of these responsibilities via NASA Form 1430A. A formal delegation letter from the CO to the DCMA office is required and must specify the exact responsibilities, products, and services to be provided. A generic request to implement the MOU is not sufficient.

The CO and PM are responsible for providing feedback if DCMA services do not meet project needs. Any changes must be formally documented. If DCMA delegation is not implemented or is withdrawn, the PM must arrange alternative surveillance and ensure adequate resources—such as project staff and Center EVM Focal Point—are available.

When a delegation is issued, the EVM FP should be notified if any EVMS issues arise. The EVM FP should remain proactive in working with all organizations, including the DCMA, to resolve EVMS issues at contractor facilities with NASA contracts. However, the PM remains responsible for the specific contract.

If DCMA does not have presence, as is the case for JPL, APL and SwRI, NASA performs the surveillance as per the NASA Agency Surveillance Plan. Find the plan on the EVM Working Group Community Site on NASA MS Teams.

3.11.5 Conduct EVM Analysis

An IPMDAR is required when EVM is a requirement. Data should be reported in a timely manner per the contractual DRD. IPMDAR data should be consistent and reconcilable with both the Monthly Contractor Financial Management Report (NASA Form 533M) and the Quarterly Contractor Financial Management Report (NASA Form 533Q) if applicable. NPD 9501.1, NASA Contractor Financial Management Reporting System, states NASA policy and provides additional information and guidance on this topic.

The first step in the analysis process is to verify the accuracy and completeness of reported EVM data (contractor IPMDARs) using CPD and SPD validator tools. All anomalies must be explained in the IPMDAR performance narrative. Minor errors or unexplained anomalies should be documented and provided to the contractor for correction, with explanations included in next month's IPMDAR. If numerous or severe issues result in IPMDAR rejection, the contractor must resubmit a corrected report. These cases should be rare with an effective surveillance process. Data analysis tools generate validity reports to support this process. For access and instructions to data analysis tools, contact your Center EVM FP or NASA EVM PE, see Section 1.3.

EVM data should be included in all management reviews. Project status based on EVM data should be reported at the level appropriate for management and utilized for insight and management actions. The PM should understand and emphasize the importance of the integrated technical, schedule, cost, and risk analyses provided by EVM in conjunction with other project information to formulate an overall project status. Concentrating on the technical aspects or technical problems of the project alone will not provide for true integrated project management. The associated schedule implications, cost drivers, and corresponding risks require consideration.

Analysis is required when any of the established variance thresholds are exceeded. Variance thresholds must be defined in the DRD.

DoD's Earned Value Management System Interpretation Guide (EVMSIG) provides a discussion of different methodologies that can be used to establish thresholds. Focusing first on these problem areas is an efficient and effective management technique. The analysis for each variance that exceeds a threshold should address three areas:

- Root cause: Simply stating the variance is not identifying the root cause. A simple way to determine root cause is to ask the question, "why?" until it no longer makes sense to do so. Another test for root cause determination is to quantify the root cause or causes as related to rates, usage, efficiency, or a combination of these.
- Impact: A root cause will create an impact on the element(s) and should also be evaluated for the impact on the rest of the project in terms of cost, schedule, technical, or a combination of these areas. Both impact on the element and impact to the project should be distinctly stated and quantified.
- Corrective actions and results: For each impact area, a correction action or recovery plan should be formulated. This plan should contain a description of the actions taken and the anticipated results in terms of the impacted area or areas, including time, cost, and technical components. If recovery is not possible, this should be clearly stated. As long as this variance exceeds the reporting threshold, each subsequent report should include the actual results of implementing corrective actions.

It is also a recommended practice for the CAM to routinely use the aforementioned methodology to analyze control accounts for potential problems that have not yet exceeded a variance threshold.

The steps outlined above help project staff understand key monthly activities in the EVM analysis process. The level of analysis depends on several factors, including project phase, WBS value, contractor performance, analyst availability and experience, contract type, and available EVM tools. These factors influence the project's ability to conduct detailed analysis.

PMs should understand these requirements and secure the necessary resources to ensure effective EVM analysis. For detailed methods and techniques, refer to the NASA EVM System Description. Additional guidance on predictive measures and metrics can be found in the NDIA IPMD Guide for Managing Programs Using Predictive Measures at https://www.ndia.org/divisions/ipmd/division-guides-and-resources

3.11.6 Participate in Project Activities

The project's EVM analyst plays a key role on the team, participating in various meetings and activities depending on the project. It is important that the EVM analyst be involved in several key activities to

ensure that the project management team has accurate information available to make informed decisions about the project. The PM should ensure EVM analyst participation in project activities that include but are not limited to:

- Regular project risk meetings to ensure that risks are captured in the EAC and schedules, and to assess the adequacy of the MR.
- Change control boards to ensure that changes are incorporated into the PMB and EACs in a timely manner.
- Planning, Programming, Budgeting and Execution (PPBE) process by supplying data to support monthly funds analysis and requirements planning.

4 EVM IMPLEMENTATION ON NASA PROJECTS

4.1 Overview

NASA has an EVM capability process that enables constituent organizations to meet the NASA and OMB requirements for compliance with the EIA-748. See Section 1.2 for details on which projects required EVM reporting. Figure 4-1 provides an example overview of the NASA EVMS process components and relationships. See the NASA EVM Capability System Description at EVM Working Group Community Site on NASA MS Teams for a more detailed description of the EVMS.

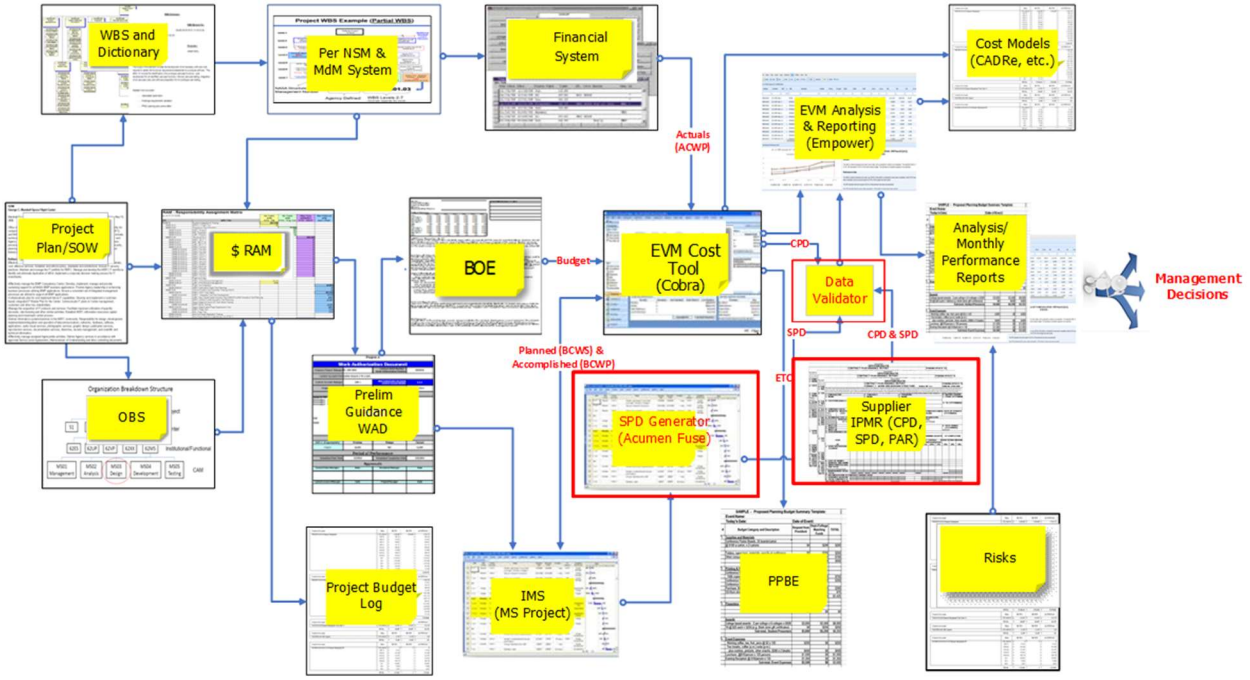

Figure 4-1 Example Overview of EVMS Process for In-house Effort

Projects should use NASA's EVMS to meet their EVM requirements. Project Plans should include the project's EVM implementation approach and use. See APPENDIX E: of this handbook for additional instruction on the format and content of the EVM Implementation Plan. PMs should engage their Center EVM FP for assistance in developing, documenting, and implementing the NASA EVM System Description on their projects. The activities required of PMs for In-house EVM implementation are very similar to those required for EVM implementation on contracts described in Section 3.

4.2 EVM Planning Begins at Project Formulation

Per NPR 7120.5 EVM reporting is required to begin in Phase B. Project planning that will support EVM analysis and reporting is an iterative process beginning early in the Formulation phase. The building block for effective planning and integrated performance management begins with the preliminary project WBS. While the initial purpose of a WBS is to define the project work and structure for cost collection, once in place it also provides the framework for integrating

management subsystems, developing schedules, and accumulating performance information. Figure 4-1 provides an overview of the NASA EVMS process that includes relevant management subsystems. Disconnects and mismatches among these systems can be minimized if estimates, budgets, schedules, costs, accomplishments, and projections are all oriented to the approved project WBS. Otherwise, the project will be required to implement labor-intensive workarounds and reconciliations to obtain reliable data for management decision making.

NASA requires the technical and financial WBS structures for each project to be the same (through level seven of the project WBS). This is accomplished through the use of the NSM system numbering scheme and controlled through NASA's Metadata Management (MdM) system which supplies the approved WBS codes (through level seven) to NASA's core financial system, SAP, and other systems that require coding structure data. This common coding system facilitates communications among all project participants. All project efforts inclusive of suppliers (all In-house, contracted, international partners, university, and any other performing entity efforts) should be included. Additionally, PMs should work with their procurement organization or other performing entities to develop the appropriate contractual language and DRDs for reporting that supports project-level planning and analysis.

It is essential that the WBS/OBS/Control Account/WP/charge code construct be carefully planned during project set-up when developing the preliminary IMS and selecting/initializing the EVM tools. This structure is the basis for schedule/budget integration and establishing the PMB prior to KDP C. The project management team should seek assistance and guidance from their Center EVM FP when establishing planning guidelines and templates. The PM should review this construct with the entire project team and enable support organizations to understand the structure and the importance of adhering to it. Since the project WBS is not baselined until the later stages of Phase B, projects should not enter the full preliminary WBS into MdM until the scope has stabilized or until specific control accounts are needed for cost collection to avoid charges to an inappropriate WBS. For additional instruction and best practices, see the NASA Work Breakdown Structure Handbook and the NASA Schedule Management Handbook at https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks

4.3 Management Reserve Planning and Usage

All projects contain some element of risk and should identify a portion of the authorized project budget value, the Project Budget Base (PBB), for unplanned activity within the project scope. EIA-748 provides for the establishment and use of MR to handle these execution risks. Unanticipated control account changes such as unexpected growth within the currently authorized work scope, rate changes, risk handling, or changes in schedule might lead to the determination that budgets assigned to a CAM are inadequate (i.e., in scope to the project but out of scope to the control accounts) and may benefit from applying MR in the replanning process.

The proper use and control of MR not only complies with the EIA-748 guidelines but is also a project management best practice. MR should not be confused with the project UFE which is a contingency fund. MR should not be eliminated from the project budget or contract prices during negotiations. UFE should be used to absorb the cost of program changes when a contract modification is needed. The budget held in MR should not be viewed by a customer as a source of funding for added work scope or used to offset accumulated overruns or under runs. Rather, MR is used to account for unplanned activity within project scope. Unexpected work scope growth

within the contract SOW, rate changes, or schedule slips are examples of situations that may make the amount of performance measurement budget assigned to the CA inadequate.

A NASA lesson learned stresses the importance of Mission Directorates/Program Managers to allow PMs to budget for and report MR to manage project risks and to comply with the EIA-748. PMs must ensure the project budget logs accurately reflect budget traceability for all budgets inclusive of MR and agree with the authorized PBB. Project EVM reports, and information should reflect MR trends and explain uses (to/from accounts). PMs should ensure their project EVMS process description and best practices clearly define MR and its use and ensure that the necessary project personnel receive training on the project MR and the relationship to UFE and funding reserves.

4.4 Budget vs Funds

The PMB represents the time-phased performance plan against which the supplier (project/contractor) is measured during the total authorized (not just annual) project scope. It is the summation of the time-phased budgets for all control accounts, applicable indirect budgets, and any UB for the authorized portion of the project lifecycle. The PMB budget along with MR and Authorized Unpriced Work (AUW) comprises the PBB as depicted in Figure 4-2 NASA Project Budget Walk Down. For contractors, this is the Contract Budget Base (CBB).

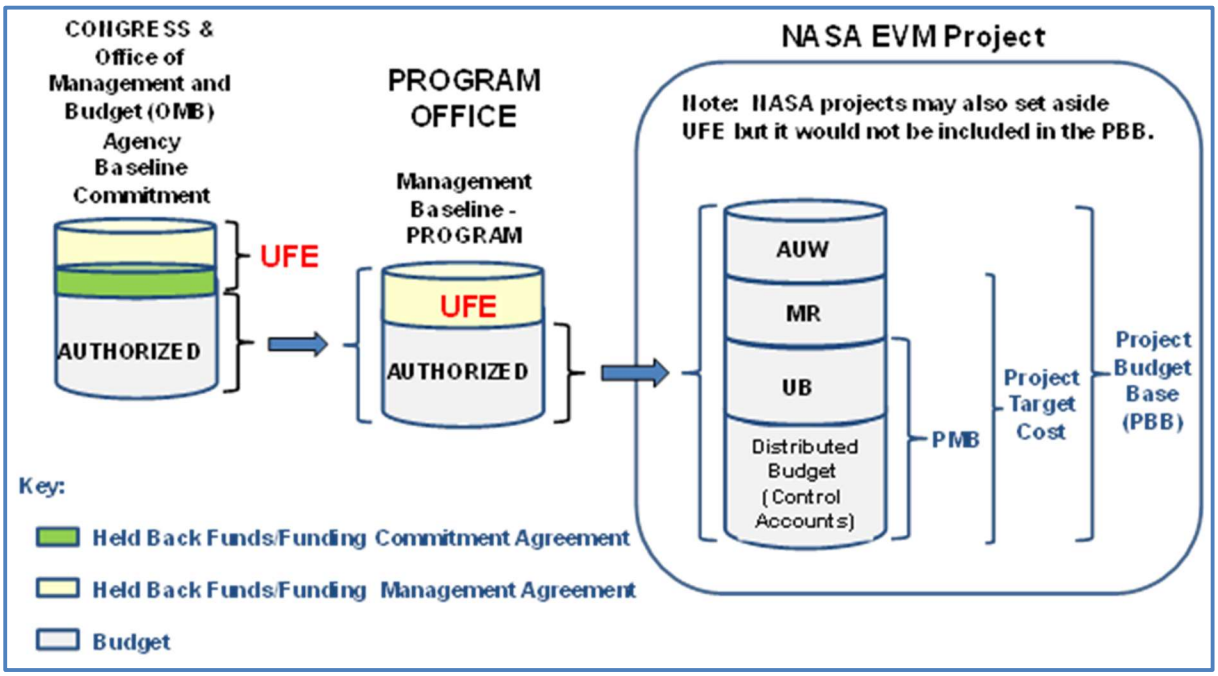

Figure 4-2 NASA Project Budget Walk Down

These budgets equate to the plan and should not be confused with project funds, the monetary resources provided to execute the plan. The funds requirements are reviewed and updated based on the project/contract EAC. A compliant EVMS is concerned with the total authorized project scope, the associated planned budget and schedule, and the resultant PMB used to measure

progress of the total project. An EAC is necessary to understand the anticipated total funding requirements required to complete the project, based on current and expected performance against the plan. It is the actual cost to date plus the estimated costs to complete the remaining work. To better understand the EAC, a Comprehensive EAC should be completed at least once a year to support the EVM and PPBE processes.

Figure 4-3 Budget versus Funds is an example of a revised funding forecast/requirement based on the EAC. A more detailed explanation of EAC development and reporting is provided in the NASA EVM System Description located at the [EVM Working Group Community Site on NASA MS Teams).]

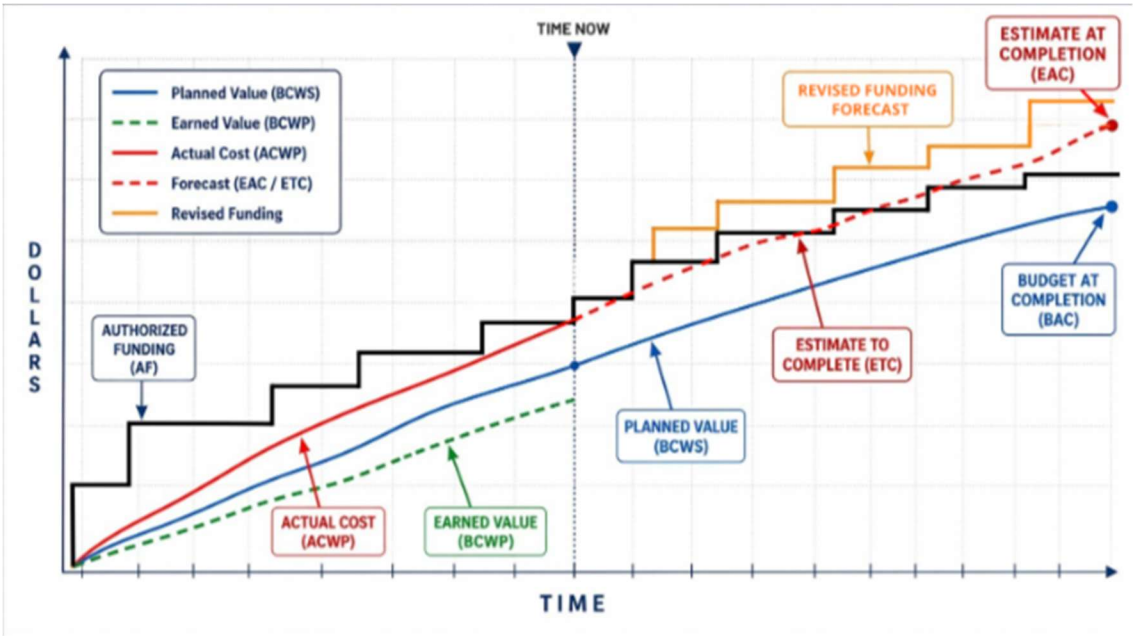

Figure 4-3 Budget versus Funds

When establishing the PMB, it is essential that the entire authorized scope (via contract, task order, approved project plan, etc.) be scheduled and budgeted (time-phased) regardless of Fiscal Year (FY) boundaries. If the Project Plan/agreement governing the project is divided into severable phases then the later phases may be segregated in planning packages. If the Project Plan/agreement authorizes only the first of several phases, in which case authorization for later phases is contingent on specific events, only the basic period's work should be scheduled and budgeted within the PBB or CBB.

To avoid major replanning, PMs will need to consider the planned funding by FY as a limiting constraint when establishing their PMB. However, funding perturbations may cause internal replanning of the baseline work or, in the case of significant funding cuts, may necessitate an authorized change to the PMB. The use of planning packages for work beyond the current FY may allow more flexibility in maintaining a valid PMB.

4.5 Basic EVMS Process Description

The PM should develop a preliminary WBS early in the Formulation phase of the project. See Figure 1-1 NASA Life Cycle for the NASA project life cycle relationships and EVM related activities. The Formulation Agreement (FA) is prepared by the project in response to the Formulation Authorization Document (FAD) to establish the technical and acquisition work that needs to be conducted during Formulation. It defines the schedule and funding requirements during Phase A and Phase B for that work. The FA includes the schedule for implementing the EVM capability and serves as the basis for the preliminary project plan. The preliminary project planning process is an iterative process. Once the project is established with sufficient and stable scope definition via the Project Plan, then both NASA In-house work elements and, if required, the contract WBS elements can be adequately planned and established at the necessary levels of detail. All project efforts (i.e., In-house, contracted, international partners, university, and any other performing entity efforts) should be included.

The Project Plan is the overall work authorization document that represents an agreement between the sponsor and the performer on work scope, schedule, and budget. Based on this scope, the WBS and WBS dictionary are established and maintained. NPR 7120.5 provides a standard template to begin WBS development for flight projects. The NASA WBS Handbook (https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks) contains additional guidance for WBS development for all projects. The WBS dictionary should be developed as a companion to the WBS and subjected to the same configuration controls.

The project WBS and WBS dictionary data are used to establish a framework in the systems that support the EVMS, such as the financial system, scheduling system, risk management system, and EVM cost tool. Disciplined configuration controls should ensure that this framework remains consistent and reconcilable in these systems. Each PM is ultimately responsible for establishing and controlling the project WBS baseline. The WBS provides a means of rolling up project data to any desired level for analysis and oversight, and provides a common reference for all project communication, both internal and external.

An Organizational Breakdown Structure (OBS) should also be developed to describe the organizations responsible for performing the authorized work. Once developed, the OBS should be cross-referenced to the WBS to ensure responsibility and accountability for planning, performing, and reporting on all authorized work. The resulting matrix is referred to as a Responsibility Assignment Matrix (RAM). The integration of the WBS and OBS creates control accounts that facilitate schedule and cost performance measurement. The control account is the primary point for work authorization, work performance management, and work performance measurement (i.e., where the planned value is established, earned value is assessed, and actual costs are collected). Each control account is assigned to a CAM. The CAM is responsible for ensuring the accomplishment of work in their control account and is the focal point for management control. A sample OBS is shown below, see Figure 4-4. Note that each individual Center should have an OBS to reflect the organization at the lowest level.

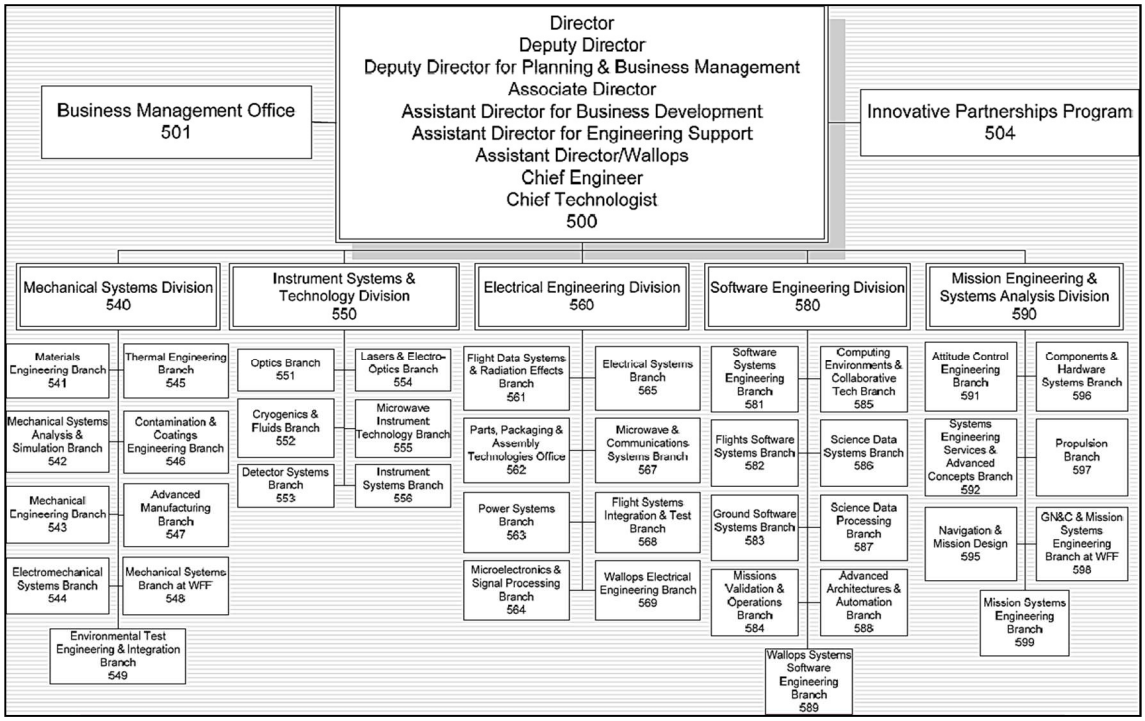

Figure 4-4 Sample Organizational Breakdown Structure

A Resource Breakdown Structure (RBS) is developed to aid in the planning process and control process. An RBS defines the resources that will be used to accomplish the scope of work on the project. Below is a sample standard RBS that projects can use. Actuals downloaded from the Agency's financial system, SAP, using the Actuate report are generated using these standard, predefined resource codes. The Actual Cost Extraction white paper (find on EVM Working Group Community Site on NASA MS Teams) describes the Actuate cost report that was developed to export resources from NASA's accounting system in a format that supports EVMS. These resource codes would be a natural choice for planning by and collecting actuals. If the Centers wish to use different resources for budgeting/planning, then the NASA codes could be used for actuals and a rollup. Having the resources rollup to common parents provides a common basis for reporting across all Centers.

	Resource	Description	Element of Cost
▶	AMMS-Inventory	AMMS Procurements	Material
	Assessment	Assessments	Other Direct Costs
	Civil Servant Labor	Civil Servant Labor	Labor
	Civil Servant Travel	Civil Servant Travel	Other Direct Costs
	Contractor Labor	Contractor Labor	Labor
	Fabrication	Fabrication Pool	Other Direct Costs
	General Procurements	General Procurements	Material
	Major Procurements	Major Procurement	Material
	Testing	Testing	Other Direct Costs
	ODC	ODC	Other Direct Costs

Figure 4-5 Sample NASA Resource Breakdown Structure (RBS)

The rates, hours, and calendars that will be used for planning must be defined up front and early in the planning process. Center CFO organizations develop and maintain labor rates for each Center. These rates should be used when "pricing out" the civil service labor to ensure that they accurately reflect each Center's rate structure. For hours, it is important that a standard number of hours per year be used in PMB development. Most likely the number of hours would be 2080 since NASA doesn't use pools to collect/distribute paid time off. If some Centers use productive hours and others use calendar hours, then the value of one hour will be different between Centers and reporting by hours will be compromised. All NASA Centers use the calendar month to represent the fiscal month; hence the last day of the calendar month is used for collecting monthly actual cost. It is important for schedule status to align with the fiscal period cut off to ensure that work aligns with actual cost. Note that JPL does not use end of month fiscal periods, so there will always be a slight disconnect when NASA Centers collaborate with JPL.

The project budget log is established with the project target cost estimate or PBB for the authorized work to maintain traceability of the project's total budget and all changes that occur over the life of the project, including the distribution of budget to the control accounts and the establishment and changes to MR and Undistributed Budget (UB). Each control account is formally authorized by a document (e.g., WAD) containing scope, period of performance, schedule, and cost (budget) approved by the delegating manager, typically the PM. The Basis of Estimate (BOE) provides the ground rules, assumptions, and drivers used in developing the cost and schedule estimates. The WADs are developed collaboratively by the project office and CAMs.

Accurate time-phasing of planned work is essential for integrating the work scope, cost, and schedule. Budgets should be planned consistent with the details from the schedule to ensure integration. The Integrated Master Schedule (IMS) is the single integrated source of schedule data that accurately reflects how the planned work is to be executed. At the core of the IMS is a logic network dataset that should be maintained in an automated schedule management tool. The dataset consists of tasks and milestones, task durations, interdependencies or relationships, project constraints, and data coding. The NASA Schedule Management Handbook contains additional guidance on schedule development and maintenance.

A time-phased budget baseline is established to facilitate cost/schedule performance measurement and provides the plan to be used on the project. Cost/schedule integration is achieved in the EVM cost tool. The Budgeted Cost for Work Scheduled (BCWS) represents the value of the time-phased

work as it is planned. The value of the work accomplished is the earned value of that work, also known as Budgeted Cost for Work Performed (BCWP).

As work is performed, actual cost for accomplishing that work, also known as Actual Cost of Work Performed (ACWP) is captured within the financial system. The integrated use of these three elements (BCWS, BCWP, and ACWP) provides the data needed to analyze schedule, cost, and technical performance. The EAC is the expected total cost of a project (or a control account) when the defined scope of work has been completed and consists of performance to date and the Estimate to Complete (ETC) the scope of work remaining. The ETC/EAC is instrumental in developing budgetary (funding) submissions required by the PPBE process. Additionally, the EVM data is used in periodic updates of the project life cycle cost and Cost Analysis Data Requirement (CADRe). The CADRe is a formal project document that describes the programmatic, technical, and life-cycle cost and schedule risk information of a project.

4.6 Integration of Data from Multiple Centers

Most NASA projects involve several NASA Centers working together. Therefore, the NASA PM at the Center where the project resides needs to determine how to obtain necessary EVM data from the other Centers. The process for work spanning multiple Centers should be very similar to the process for projects with contracts. While the Intra-Agency Work Agreement or "contract" between Centers can take many different formats, the intent is the same. The contract between Centers should act as an agreement of the scope, estimated cost, and schedule to complete the work. In this Intra-Agency Work Agreement, the Center where the project resides must include requirements for EVMS compliance (if applicable), WBS, RBS, rates, calendars, hours, EVM and IMS, reviews, variance thresholds, and anything else necessary to manage the work, using the methodologies employed with contractors. In cases where the Intra-Agency Work Agreement does not meet the threshold for EVM, the project should flow down the appropriate data requirements necessary to support performance management. See the Reporting for Contracts with no EVM Requirement Guide located on the NASA EVM website at https://www.nasa.gov/ocfo/ppc-corner/evm/regulations/ for additional information. The pre- and post-contract award activities discussed in section 3 are similar for Intra-Agency Work Agreements.

4.7 Management Reporting and Data Analysis

Reporting and analysis are most efficient when levels and thresholds are carefully crafted, and the primary focus is on elements that exceed these thresholds. The IPMDAR Implementation and Tailoring Guide, 24 August 2021 at (https://www.acq.osd.mil/asda/ae/ada/ipm/docs/IPMDAR%20Implementation%20and%20Tailoring%20Guide_Stamped.pdf) provides additional guidance on establishing relevant thresholds. A well-crafted reporting structure should provide the ability to quickly examine the data to determine the source of significant technical, cost, and schedule variances. See Section 3.6.

Whereas the PMB is important to measure performance against a plan (budget), an EAC is necessary to understand the anticipated total funding requirements to complete the project. Real-time updates of EAC at individual control accounts to address issues should occur during the monthly review and analysis of performance as appropriate. A Comprehensive EAC is required at least once a year to better understand the Project's EAC and total estimated funding requirements.

An appropriate time to conduct this Comprehensive EAC is in conjunction with the preparation of the annual PPBE inputs.

4.8 Changes to Baseline Data: Rolling Wave Planning, Replanning, Rebaseling, and Reprogramming

All changes to the PBB/Contract Budget Base (CBB) and Performance Measurement Baseline (PMB) - including scope, schedule, budget, and EAC - must be documented to ensure traceability, management control, and compliance with EIA-748. Updates often impact related data, such as risk management information. While flexibility is allowed to maintain a realistic baseline, stability is essential for accurate measurement of cost, schedule, and technical performance. Corrections are made when erroneous data significantly affect the value of the EVM system; however, frequent changes to current plans or historical performance can compromise report integrity.

Examples of changes include:

- Scope Adjustments: Adding new work packages or removing tasks due to contract modifications.
- Schedule Changes: Revising activity start or finish dates to reflect delays or acceleration.
- Budget Updates: Reallocating funds between control accounts or adjusting for approved change requests.
- EAC Revisions: Updating cost forecasts based on performance trends or risk impacts.

There are three types of changes affecting the PBB/CBB and/or PMB:

1. Replanning: Adjusting future work within the existing baseline to improve realism without changing past performance. This includes Rolling Wave Planning.
2. Rebaselining: Establishing a new baseline when major changes in scope or schedule make the original plan obsolete.
3. Reprogramming: Implementing significant changes to both past and future work, typically due to major overruns or restructuring.

Replanning

Keeping the PBB and the PMB up to date and reflective of authorized scope are essential elements for valid performance measurement on NASA programs/projects/contracts. Revisions to schedule, budgets, and work scope must be processed in a disciplined manner to maintain a clear path from the original approved PMB and to implement changes in a timely manner as prescribed by the EIA-748. Any revisions to the PBB or CBB and PMB are incorporated through replanning actions. Replanning occurs when there is a change in the original plan for accomplishing the authorized scope, typically involving the redistribution of budget for remaining work. Changes requiring replanning can be thought of as internally driven or externally driven.

Internally driven changes, or internal replanning, involve realigning scope, schedule, or budget for the remaining project effort within the authorized PBB. Internal changes also include the correction of errors and routine accounting adjustments that improve the accuracy of the data. Examples of internal replanning include changes resulting from design reviews, reorganization of

work or people to improve efficiency of operations, or rate changes. The PM approves changes to remaining work, including changes that require allocation of MR. Internal replanning is restricted to remaining effort and, if significant, the customer must be advised of the action.

External changes are driven by the customer and require the project to revise its planning to accommodate these changes. Examples of externally directed changes that result in replanning include customer directed changes; funding perturbations resulting from the PPBE process (project re-scope, schedule stretch out, etc.); or an engineering change proposal that changes baseline scope, schedule, or budget; partial stop work. An external change may be driven by a rebaseline of the project commitment agreement or ABC.

When replanning (internal or external) of the PBB or PMB is required, the least preferred method is eliminating both the cost and schedule variances. This method should only be used to improve the validity and usefulness of the EVM performance data. PMs should consult with their EVM FP for assistance in defining the appropriate replanning approach when internal or external replanning is required.

On projects with extended timelines, 3 years or more, where detailed planning becomes unreasonable, projects should implement rolling wave planning. For more information on the Rolling wave process refer to the NASA Scheduling Management Handbook https://www.nasa.gov/ocfo/ppc-corner/ppc-guidance-documents/#EVMHandbooks.

Rebaselining

In the context of the PMB, NASA project personnel typically associate the term rebaselining with the process of eliminating all variances (cost and schedule) incurred against the PMB and re-establishing the PMB to reflect changes (usually reductions) in the project funding resulting from the annual PPBE process. However, this is not consistent with the best practices defined in the EIA-748 or the definition of rebaselining in NPR 7120.5. *Rebaselining* is the process that results from a change to the project's Agency Baseline Commitment (ABC). The ABC establishes and documents an integrated set of project requirements, cost, schedule, technical content, and an agreed-to Joint Confidence Level that forms the basis for NASA's commitment with the external entities of OMB and Congress." The PBB value is established within this external commitment by the Program Manager and the PM.

Reprogramming

Reprogramming is a comprehensive replanning of the remaining PMB that results in a total allocated budget that exceeds the Contract Budget Base (CBB), also known as Over Target Baseline (OTB), and/or a baseline schedule that exceeds contract milestones, also known as Over Target Schedule (OTS). During the life of a contract, situations may arise whereby available contract budgets or schedule timeframes for the remaining work are insufficient. Consequently, performance measurement against the available budgets and/or contractual milestones become unrealistic. To improve managerial control, reprogramming may entail replanning future work, replanning in-process work, or adjusting variances (that is, cost, schedule, or both). For more guidance on the OTB/OTS process refer to https://www.acq.osd.mil/asda/ae/ada/ipm/docs/OTB-OTS_Guide_121205.pdf.

4.9 Project EVMS Surveillance

PMs are responsible for ensuring the accuracy and reliability of the EVMS and performance measurement data. They play a key role in the NASA surveillance process, which includes In-house, supplier and contractor EVMS surveillance. The objectives of EVMS surveillance are to ensure continued EVMS compliance with the EIA-748 and data reliability across the project. The PM typically coordinates delegation of contract EVM surveillance requirements to the DCMA. For projects that are greater than or equal to $250M, the PM will support the development of a surveillance plan that is inclusive of the In-house work. Find the NASA Supplier and Agency Surveillance Plan on EVM Working Group Community Site on NASA MS Teams. It provides additional guidance for performing project EVMS surveillance.

4.10 Minimum Waiver Requirements for NASA In-house Programs and Projects

NPR 7120.5 defines the requirements for application of an EVMS to NASA projects and programs. When a program or project meets the requirements for EVM application yet wants to implement a management system not fully compliant with the guidelines in EIA-748 a waiver request must be submitted to the NASA EVM PE. The request must include the minimum waiver requirements defined in APPENDIX D: of this handbook.

Minimum waiver requirements are designed to ensure that the decision makers have the necessary information to evaluate the waiver request. This information is also used to support audits coming from entities within and external to NASA. The minimum waiver requirements are modeled after NFS 1852.234-1, which NASA uses in solicitations to inform the potential offeror(s) of the requirement to use an EIA-748 compliant EVMS. The EVM FP is a source for information and can help minimize time and effort for preparation and disposition.

In some cases, prior to the waiver request being made, the NASA EVM PE will evaluate project provided data and make an "EVM Determination" on EVM applicability. Only the In-house portion of the project is subject to an EVM Determination. Projects must have completed Systems Requirements Review (SRR) prior to requesting an EVM Determination.

4.11 EVM Implementation and Letter Contracts

In accordance with FAR 16.603, a letter contract is a written preliminary contractual instrument that authorizes the contractor to begin work immediately. NASA uses this type of contract when (1) the government's interests demand that the contractor be given a binding commitment so that work can start immediately, and (2) when negotiating a definitive contract is not possible in sufficient time to meet the requirement. The letter contract should be as complete and definite as feasible under the circumstances and should include the EVMS clauses that are appropriate for the planned type of contract. The letter contract will also include a negotiated definitization schedule that includes the dates for submission of the contractor's price proposal and a target date for definitization. The schedule will provide for definitization of the contract within 180 calendar days after the date of the letter contract or before completion of 40 percent of the work to be performed, whichever occurs first.

Definitizing a letter contract can take months or years, limiting NASA's visibility into contractor performance. Contractors can often delay establishing a PMB, even an interim one, until definitization. Without an interim PMB, performance assessment and risk analysis are difficult,

reducing planning and control for both parties. The process for incorporating the authorized but not negotiated or definitized change budget into the PMB is to record the proposal value or NTE in the project budget base log as AUW. Contractors will assign this budget to UB and then allocate to control accounts for near-term work. See the NASA EVM System Description for more explanation.

PMs ensure that the prime contractors comply with the EVMS and reporting requirements included in letter contract awards. This includes the initialization of the PMB, submission of the IPMDAR and the WBS and other reporting in accordance with the DRDs, and completion of the IBR within 180 calendar days after contract, subcontract, or task order award, or the exercise of significant contractual options, or within 60 calendar days after distribution of a supplemental agreement that implements a significant funding realignment or effects a significant change in contractual requirements (in accordance with the EVMS clause). PMs should not allow waivers to these requirements. If a delay in EVM implementation is warranted, PMs should coordinate EVM waivers with Procurement and the Contracting Officer and follow NPR 7120.5 waiver process.

APPENDIX A: EXAMPLE CONTRACT EVMS IMPLEMENTATION ACTIVITIES

ACTIVITIES DESCRIPTION	RESPONSIBILITY	REFERENCE/NOTES
Pre-Award Activities		
☐ Develop Program WBS and WBS Dictionary, in accordance with (IAW) NASA procedures	PM	
☐ Develop/include Contract WBS DRD in RFP	PM/CO	
☐ Define/include EVMS clause and appropriately tailored IPMDAR DRD in RFP (consult with appropriate EVM FP)	PM/CO	
☐ Conduct review/acceptance of offeror's comprehensive EVMS Plan; coordinate with DCMA, NASA EVM PE and/or Center EVM FP as appropriate.	PM/CO	
An acceptable EVMS Plan (ref NFS 1852.234.1 Notice of EVMS) o Describes the EVMS to be used in performance of contract: ▪ Identifies current system/proposed modifications (gap analysis) ▪ Correlates management processes with the 32 Guidelines o Describes procedures for application of EVMS requirements to subcontractors o Describes process for ensuring EVMS compliance for each subcontractor if not previously validated o Provides documentation describing any self-evaluation of system's compliance with EVMS guidelines o If proposal ≥ $100M (or > $150M SMD Cat3/Class D), provide schedule of events leading up to validation/government acceptance of EVMS. Recommended: ▪ Initial PMB within 90 days after contract award recommended, but NLT 180 days ▪ "IBR shall be conducted within 180 calendar days after contract, subcontract, or task order award…" ▪ Conduct EVMS Compliance Review (CR) ▪ CO compliance determination		
☐ Incorporate major subcontractor(s) effort if not defined at contract award into contract EVMS clause (NFS 1852.234-2 EVMS or Alt 1)	PM/CO	
Post Award Activities (Contracts Requiring EVMS Validation/Acceptance)		
☐ Delegate EVMS Acceptance/Surveillance to DCMA via NF1430A	PM/CO	
☐ Develop CR Plan/identify team/coordinate with NASA EVM PE/PM	CR Lead	
☐ Conduct EVMS review by DCMA or NASA EVM Program Executive/Team	CR Lead/PM/CO	
☐ Monitor EVMS implementation progress/readiness via progress assessment tag-ups o EVMS implementation schedule status o EVMS tool identification/implementation o EVMS training as appropriate o EVMS processes compliance with EIA-748 guidelines o Process/products IAW with EVMS description	CR Lead	
☐ Coordinate EVMS documentation requirements with contractor	CR Lead/CO	
Conduct CR (Document management process/implementation issues; Address initial findings in exit brief	CR Lead/team	
☐ Verify corrective actions	CR Lead/team	
☐ Prepare final draft CR Report; provide to NASA EVM PE, PM, EVM FP for review/concurrence	CR Lead	
☐ Submit final CR Report to CO to support determination of contractual compliance	CR Lead	
☐ Issue contract determination of compliance	CO/PM	
☐ Conduct data driven surveillance/ensure EVMS compliance/data reliability (i.e., EVM data anomalies reports; schedule health check)	DCMA/PM	

*CR Lead = EVMS Compliance Review Lead; PM=Program/Project Manager; CO=Contracting Officer; EVM FP = Earned Value Management Focal Point (Mission Directorate/Center)

APPENDIX B: SAMPLE SCOPE PARAGRAPHS

The following are recommended SOW inputs for inclusion in the RFP. For Intra-Agency Work Agreements, the term "supplier" may be used in lieu of "contractor" and "agreement" in lieu of "contract."

Project Management Reviews. The contractor shall conduct Project Management Review (PMR) meetings at mutually agreed upon dates and locations. During the reviews, the contractor shall present integrated cost, schedule, and technical performance status. Integrated Product Team leads or functional managers shall include cost information in discussions of schedule status, technical performance, and risk using earned value management as an integrating tool. The following shall be addressed: Cost/schedule trends, significant cost/schedule technical variances, projected impacts, quantified risk assessments, and corrective action plans. (DRD PMR)

Contractor Integrated Performance Measurement. The contractor shall establish, maintain, and use in the performance of this contract, an Earned Value Management System (EVMS). The correlation and integration of these systems and processes shall provide for early indication of cost and schedule problems, and their relation to technical achievement. (DRD IPMDAR)

Integrated Master Schedule (IMS). The contractor shall develop and maintain an IMS by logically networking detailed program activities. The schedule shall contain the planned events and milestones, accomplishments, criteria, and activities from contract award to the completion of the requirement. (DRD IPMDAR)

Integrated Baseline Reviews (IBRs). The contractor shall present its performance measurement baseline plan to the Government within 180 calendar days after contract subcontract, or task order award, or the exercise of significant contract options, or within 60 calendar days after distribution of a supplemental agreement that implements a significant funding realignment or effects a significant change in contractual requirements (e.g., incorporation of major modifications. The Government will verify during the IBR, and follow-on IBRs when required, that the contractor has established and maintains a reliable performance measurement baseline. The contractor will ensure that the baseline includes the entire contract technical scope of work is consistent with contract schedule requirements, and has adequate resources assigned. The contractor will assure the Government that effective earned value methods are used to accurately status contract cost, schedule, and technical performance. The contractor will perform a self-assessment of the cost and schedule risk for the IBR. The IBR will be used to achieve a mutual understanding of the baseline plan, cost and schedule risk, and the underlying management processes used for planning and controlling the project.

APPENDIX C: EVMS ACCEPTANCE PROCESS

1.Overview

The EVMS acceptance process applies to those NASA suppliers that require EVMS compliance and acceptance (contracts ≥ $100 million or >$150M if SMD Cat3/Class-D) when the Supplier does not have a current EVMS validation. There are three steps for evaluating compliance:

1) assess whether the contractor's EVM System Description adequately documents how its system meets the intent of the EIA-748 Guidelines,
2) evaluate the contractor's ability to demonstrate the EVMS implementation as described by the EVM System Description and supplemental procedures, and
3) ensure the EVMS is providing timely, accurate, reliable, and auditable data.

Compliance is determined based upon the results of all three steps.

OMB and NASA recognize DCMA's acceptance of contractor EVMS compliance. NASA employs DCMA for the contractor EVMS acceptance process. NASA has a MOU with DCMA located at https://www.nasa.gov/ocfo/ppc-corner/evm/regulations/ that assigns responsibility for the validation and surveillance of a contractor's EVMS to DCMA. The approach for validating a contractor's EVMS when DCMA is delegated contractor EVMS acceptance involves nine (9) Business Practices which can be found at https://www.dcma.mil/HQ/EVMS/.

For those suppliers that EVMS acceptance is not delegated to DCMA such as Civilian agencies, universities, not for profits, laboratories, one-time contracts, etc., then NASA is responsible for verifying the EVMS acceptance and contract compliance determination. Figure C-1 provides a decision matrix for determining system acceptance and surveillance review responsibility. The acceptance process generally follows the same steps as the DCMA led compliance reviews by using the DoD Earned Value Management System Interpretation Guide (current revision) located at https://www.acq.osd.mil/asda/ae/ada/ipm/policy-guidance.html #guides-references as the common standard interpretation guide. The process also leverages the following guides when applicable: NDIA IPMD Earned Value Management System Acceptance Guide, Intent Guide and Guideline Scalability Guide located at https://www.ndia.org/ divisions/ipmd/division-guides-and-resources.

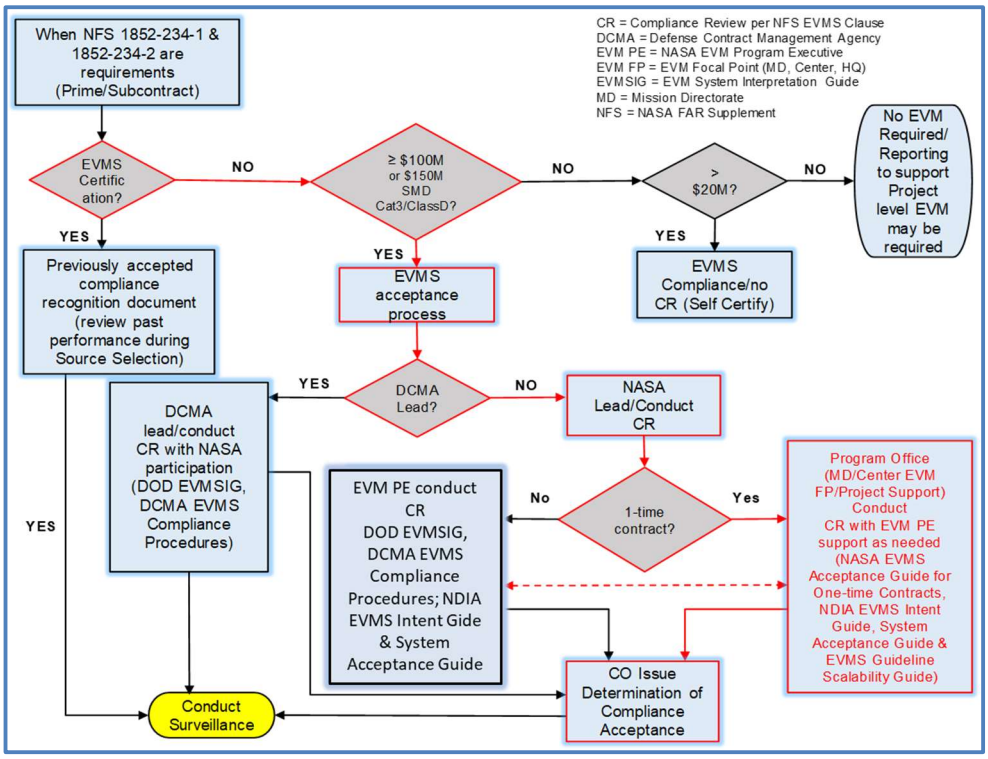

Figure C-1 EVMS Acceptance Responsibility Overview

2. Roles and Responsibilities

The roles and responsibilities are summarized below.

- DCMA assesses Contractor EVMS Compliance with EIA-748 for most contracts, except contracts that do not already have a DCMA presence, such as universities, not-for-profits, laboratories.
    - Assigns the Review Director for the Compliance Review (CR) for NASA contracts when delegated, and
    - Issues Compliance Recognition Document via NASA Contracting Officer to the contractor once EVMS is accepted.

- The CR Team is led by the DCMA Review Director who
    - Establishes team comprised of DCMA EVMS support and Defense Contract Audit Agency (DCAA) if applicable; and NASA EVM PE; and NASA EVM/Schedule Subject Matter Experts,
    - Plans review approach/requirements with contractor and NASA Project Office, and
    - Conducts the review and documents compliance.

- The NASA PM and CO
    - Ensures EVMS requirement (NFS EVMS, reporting, etc.) is incorporated into the solicitation/contract,
    - Delegates EVMS system acceptance and surveillance to DCMA,
    - Participates in the CR as applicable, and
    - Documents approved EVMS in the contract per the NFS EVMS clause.

- EVM System Owner is the contractor with the EVMS requirement
    - Develops and maintains EVMS Implementation Plan,
    - Establishes and implements the EVMS (policies, processes, resources, tools, training),
    - Supports the CR team during the system acceptance process, and
    - Demonstrates EVMS compliance with the EIA-748.

3. Contractor EVMS Acceptance Approach

Planning Phase

Prior to contract award, the NASA CO with assistance from the SEB, the EVM FP and DCMA (if required), should review the contractor's proposed EVMS Implementation Plan that was submitted with the proposal. Once the contract is awarded, the contractor executes the EVMS Implementation Plan. The CO for the NASA Project Office delegates EVMS system acceptance and surveillance to DCMA. The DCMA will assign the Review Director who will prepare the CR plan jointly with the contractor and the NASA Project Office. This plan will address the applicable interim reviews such as the Initial Visit and the CR.

The primary products from this step include the contractor EVMS Implementation Plan, the CO delegation letter to DCMA, and the initial CR Plan.

The CO with support from the PM is responsible for ensuring the contractor's EVMS compliance with the EIA-748 and contractual compliance. If the NASA Project Office and CO do not delegate system acceptance and surveillance to DCMA (which may not be appropriate for Civilian Agencies, universities, or other entities) or DCMA is unable to accept the delegation, then the PM is responsible for requesting the assistance of the Center EVM FP and for notifying the appropriate organization as noted in the figure above to conduct the review. Additional information is provided in the *NASA Earned Value Management System Acceptance Process for One-time Contracts Guide* (currently under revision).

Design and Implementation Phase

The contractor executes the EVMS Implementation Plan which includes the schedule with resources assigned to ensure proper and effective design, documentation, implementation, and maintenance of the management system that complies with EIA-748. The contractor establishes EVM policy followed by the development and implementation of an EVMS. There are several approaches to documenting the processes involved in the structure of an EVMS. A typical approach is a single document referred to as a System Description that describes how the program management processes and procedures meet the intent of EIA-748.

Implementation of the EVMS occurs during the system design and documentation process. As the processes are implemented, feedback on the effectiveness and accuracy of system documentation and procedures is important to ensure that needed improvements are incorporated in a timely manner. Keep in mind that the contractor is obligated to implement the planning and control processes to ensure establishment of a reliable preliminary PMB and support the IBR required within 180 calendar days after contract award.

The contractor should also conduct internal training in the basic concepts of EVM and specific process elements of the EVMS that includes unique project management aspects of the system,

forms designed for implementation, and process-oriented interfaces with other internal systems. This training should occur early in the implementation phase.

During this phase, the CR team will monitor the contractor's progress toward implementing the EVMS, assess the contractor's readiness to demonstrate a fully integrated EVMS based on the results of the contractor's internal self-assessment and will also finalize the CR Plan.

Review Phase

The purpose of the CR is to conduct a formal assessment of the contractor's proposed management system to verify that the system meets the intent of EIA-748. The primary objectives are:

- Evaluate the management system capabilities against the EIA-748 guidelines,
- Assess the description of the management system to determine if it adequately describes the management processes demonstrated during the review, and
- Evaluate the application of the EVMS on the contract being reviewed.

The review consists of system documentation reviews, data traces and discussions with contractor personnel including Control Account Managers, Functional Managers, Business Manager, and PM. The system documentation reviews, and data traces are typically performed prior to the onsite review which includes discussions with the contractor personnel. During this process step, the contractor demonstrates to the team how the EVMS is structured and used in actual operation. Major activities include:

- Findings are documented in a Deficiency Report (DR). The DR is a systemic or limited occurrence of an EIA-748 non-compliance or a significant impact to reporting and requires a corrective action plan (CAP).
- Other issues may be documented in the form of a continuous improvement opportunity.

During this phase, the team prepares a written report documenting the activities of the review and its results. The team's findings will include actions that are required prior to obtaining validation of compliance. The report will reflect how the team verified compliance with the guidelines, and that the described system was properly and effectively implemented on the contract(s) under review.

Acceptance Phase

Before a final decision on acceptance is made, the contractor should provide documentation that all corrective actions for DRs have been completed. The Acceptance Authority reviews the CR Report and determines that the contractor's EVMS complies with EIA-748 and the contract, project or program is using the compliant EVMS. The EVMS compliance recognition is a letter or compliance recognition document that clearly indicates the system reviewed complies with EIA-748.

Once the acceptance document is issued, the contractor is required to maintain the system and implement EVM. The contractor should notify the Acceptance Authority issuing the system compliance recognition when revisions are made to the EVMS policy, process, procedures, or practices. Continued EVMS compliance is determined through surveillance.

After acceptance, DCMA will perform system surveillance, as delegated, to verify the system is being maintained and used by the contractor. For contracts where NASA led validation reviews occurred, the NASA EVM PE is responsible, with support from the NASA Project Office and applicable Center EVM FP, for the surveillance process.

EVMS Reciprocity

NASA supports OMB's efforts to eliminate duplicative and costly EVMS reviews per the OMB memo dated October 23, 2015, Subject: *Reducing the Burden of Certifying Earned Value Management Systems (EVMS)*. NASA currently recognizes contractors' EVMS acceptance by DCMA and the Federal Aviation Agency (FAA). NASA is pursuing reciprocal agreements with DCMA and other agencies for those contractors where NASA has conducted the CR and accepted the EVMS as the Cognizant Federal Agency. NASA's EVM PE maintains the compliance review information (e.g., reports and findings). Reciprocal agreements will be posted to the NASA EVM website at https://www.nasa.gov/ocfo/ppc-corner/evm/regulations/ in accordance with the reciprocal MOUs.

APPENDIX D: MINIMUM WAIVER REQUIREMENTS FOR NASA IN-HOUSE PROGRAMS AND PROJECTS

Evaluate if EVM applies. Refer to Section 0 Policy and Requirements for the Application of EVM to confirm that EVM applies. Only if the answer is yes, complete the following requirements.

Requirements: Any waiver request submitted to NASA headquarters OCFO/SIB must include the following information:

1. A description of the management system that will be used in the performance of the program or project. This could be captured in documentation such as a program or project plan, Center management practices, or other program/project documentation.
2. A matrix that correlates each guideline in EIA-748 to the corresponding process in the program or project written management procedures. This is referred to as a Compliance Review Checklist (CRC) and can be found in the figure below.
    a. For each of the 32 guidelines, state whether or not the program or project's documented management procedures meet the intent of the guideline.
    b. Provide a corresponding reference to the program or project's written management procedures for each guideline.
    c. For each guideline that is not met, describe a plan for compliance or rationale describing why the guideline will not be met.
3. The proposed procedures for application of the EVMS requirements to suppliers. This could take several forms including an EVM Implementation Plan, EVM clause(s), DRDs for the IPMDAR, WBS, and other EVM-type reporting, Intra-Agency Work Agreements, Program or Project plan, Acquisition Plan or other.

4. A point of contact for additional information or assistance to support review of the request.

Guideline - EIA-748 (*Note: Check with EVM FP for current revision of EIA-748 and CRC)*	**Intent Met? Yes/No**	**Management Procedure Reference & Notes**	**Plan for Compliance or Rationale for Non-Compliance**
Organization			
1. Decompose Scope Using a Work Breakdown Structure			
2. Identify Organizational Responsibilities for the Work			
3. Integrate WBS/OBS to Create Control Accounts			

Guideline - EIA-748 (*Note: Check with EVM FP for current revision of EIA-748 and CRC)*	Intent Met? Yes/No	Management Procedure Reference & Notes	Plan for Compliance or Rationale for Non-Compliance
4. Integrate Management Processes Using the WBS and OBS			
Planning, Scheduling and Budgeting			
5. Identify Indicators to Measure Progress			
6. Schedule the Authorized Work			
7. Establish and Maintain a Time Phased Budget Baseline			
8. Authorize Scope, Schedule and Budget by Cost Elements			
9. Plan Authorized Scope, Schedule and Budget into WPs/PPs			
10. Establish Work Package Performance Measurement Criteria			
11. Develop / Apply Indirect Rates to Determine Indirect Budgets			
12. Identify Any Undistributed Budget and Management Reserve			
13. Reconcile to Target Cost Goals			
Progress Assessment and Data Collection			
14. Measure Progress and Determine Earned Value			
15. Collect Actual Costs by Elements of Cost for Work Performed			

Guideline - EIA-748 (*Note: Check with EVM FP for current revision of EIA-748 and CRC)*	Intent Met? Yes/No	Management Procedure Reference & Notes	Plan for Compliance or Rationale for Non-Compliance
16. Account for Purchased Material			
Analysis and Management Reports			
17. Generate Schedule and Cost Variances			
18. Identify and Evaluate Significant Variances			
19. Evaluate Indirect Cost Variances			
20. Update Control Account Estimates at Completion			
21. Summarize, Review and Evaluate Performance Data and Variances			
22. Implement Management Actions in Response to EVM Data			
23. Develop Revised Program Estimate at Completion			
Revisions and Data Maintenance			
24. Incorporate Customer Directed Changes			
25. Document and Reconcile Internal Replanning Changes			
26. Control Retroactive Changes			

Guideline - EIA-748 (*Note: Check with EVM FP for current revision of EIA-748 and CRC)*	Intent Met? Yes/No	Management Procedure Reference & Notes	Plan for Compliance or Rationale for Non-Compliance
27. Over Target Baseline or Over Target Schedule			

Figure D-1: EVMS Guideline Compliance Review Checklist

APPENDIX E: EVM IMPLEMENTATION DESCRIPTION IN PROJECT PLANS

1. **Purpose:** The purpose of this template is to provide guidance and instruction on a suggested format and information to be included in the Project Plan when EVM is required.
2. **Background:** In accordance with NPR 7120.5, NASA Space Flight Program and Project Management Requirements, major projects MUST prepare a Project Plan that provides an agreement between the PM, Program Manager, and Center Director, on the scope, implementation approach, project operational environment, and the baseline commitments of the project. The Project Plan is updated over the project life cycle in response to changes in program requirements on the project or the baseline commitments. Execution of the Project Plan is the responsibility of the PM. The Plan includes accompanying stand-alone plans such as Safety and Mission Assurance, Risk Management, System Engineering Management, Software Management, Security, Technical/Cost/Schedule and Control Plan, summarized in Project Plan Requirements in the next section, which collectively provide the guidance and control for the project.
3. **Project Plan Requirements:** The Project Plan Template is included as an appendix in NPR 7120.5, Appendix H, Project Plan Template, section 3.1, Technical, Schedule, and Cost Control Plan. Projects are required to describe how it plans to control project requirements, technical design, schedule, and cost to achieve the program requirements on the project to include EVM. The EVM implementation approach can be included in this section or described in a separate control plan and referenced in this section. The Technical, Schedule, and Cost Control Plan describes the project's implementation of EVM including:
    a. How the PMB will be developed and maintained for the project and how UFE will be established and controlled.
    b. The methods the project will use to authorize the work (e.g., work agreements) and to communicate changes to the scope, schedule, and budget of all suppliers. How the plan is updated as make-buy decisions and agreements are made.
    c. The process to be used by the project to communicate the forecasted time-phased levels of funding to be made available to each supplier.
    d. For the class of suppliers not required to use EVM, the schedule and resource information required of the suppliers to establish and maintain a baseline and to quantify schedule and cost variances. How contractor performance reports will be required.
    e. How the cost and schedule data from all partners/suppliers will be integrated to form a total project-level assessment of cost and schedule performance.
    f. How the project plans to report technical, schedule, and cost status to the program manager, including the frequency.
    g. A description of any additional tools necessary to implement the project's control processes (e.g., the requirements management system, project scheduling system, project information management systems, budgeting, risk management, and cost accounting system).

h. The process for establishing, monitoring, and controlling the IMS and the process for utilizing the project's technical and schedule margins and UFE to meet the Management and Commitment Baselines.

4. Assumptions:

When EVM is required, new projects will implement the NASA EVM Capability to ensure compliance with the EIA-748 standard for EVMS and include this as a reference in their EVM Implementation Plan. The EVM Capability consists of processes, procedures, tools, and training. Use of NASA's EVM Capability and processes ensures compliance with the EIA-748 standard and allows customization to match the individual needs of the program or project, while still meeting the EIA-748 guidelines. NASA's EVM System Description and EVM Capability training can be found EVM Working Group Community Site on NASA MS Teams. The project will describe any tailoring of the procedures for their specific application in their EVM Implementation Plan to include the topics in section 5.

If the project does not use the NASA EVM Capability Process, then it must fully describe the EVM processes, procedures, tools, and training that will be implemented on the project and include a matrix that demonstrates how this approach complies with the 32 guidelines of the EIA-748. See the NASA EVM System Description for an example of the type of processes, procedures, and tools required to comply with this requirement. Projects should use the compliance map included in the NDIA IPMD EVMS Intent Guide as an aid in verifying their compliance with the EIA-748 EVMS guidelines.

5. Specific Topics:

The outline and instructions of this template serve as a guide for projects in developing and communicating the specific EVM applications for their project. The Project should include information that is unique to its EVM implementation such as EVMS milestones, process flowcharts and diagrams to better illustrate specific processes described in the NASA EVM capability (see the NASA EVM System Description), management system architecture, business process timelines.

Projects should coordinate with their applicable EVM FP (see https://www.nasa.gov/ocfo/ppc-corner/evm/evmwg/) for guidance and assistance in implementing EVM and preparing their EVM Implementation Plan. In addition to the requirements listed in Section 3 above, projects should describe the following:

a. Project EVMS implementation milestones through PMB establishment, project, and supplier IBRs and other related milestones.
b. Project team at control account level, specific roles, and responsibilities to include the Program, Planning and Control (PP&C) roles and responsibilities.
c. Structures that will be used for planning including the WBS and WBS Dictionary and charge code relationships, the RBS, OBS, RAM, rates, fiscal calendars, planning hours.
d. Work Authorization process (work agreement process) and form that will be used.
e. System architecture/tools used in the EVM system.
f. Process for planning and accumulating indirect cost.
g. Monthly Business Rhythm (input/output timeline to include download actual cost; update/analyze IMS; EV update; supplier IMS/EVM analysis/system update; prepare

VARs; CAM reviews; project level reviews; prepare and submit monthly report; IMS and EVM validity reviews).

h. Management meetings/reviews (internal/external, frequency, information requirements such as specific metrics and trend analysis charts).
i. List of contracts/agreements and flowdown/reporting requirements - contractor name, scope, value, period of performance, flowdown requirements to include EVM, date of validated EVMS or plan for validation if applicable, other reporting, etc.), COR/Tech lead.
j. Rolling wave planning approach.
k. Process for tying EVM to risk management for EAC updates.
l. IBR schedule and plan (both In-house and contractor).
m. Use of estimated actuals and reconciliation process.
n. Integrated performance analysis and reporting (IMS, NF533 data reconciliation, ETC/EAC, funds forecast, Risk Register and schedule margin/MR analysis, EV metrics, UFE assessment).
o. ETC/EAC approach and frequency, including routine and comprehensive EAC.
p. Thresholds for identifying significant variances and VAR preparation to include specific form if used.
q. Change management process - Baseline Change Requests, Budget Log(s) (process, forms, approvals, replanning methods).
r. Identify process for incorporating new rates into the baseline if necessary.
s. Training requirements/plan (EVM basics, project team training on EVM capability, tools).
t. EVMS surveillance approach (In-house and contractor).

APPENDIX F: ACRONYMS

Acronym	Definition
ABC	Agency Baseline Commitment
ACO	Administrative Contracting Officer
ACWP	Actual Cost of Work Performed
BAC	Budget at Completion
BCWP	Budgeted Cost for Work Performed
BCWR	Budgeted Cost for Work Remaining
BCWS	Budgeted Cost for Work Scheduled
CADRe	Cost Analysis Data Requirement
CAM	Control Account Manager
CAP	Control Account Plan or Corrective Action Plan
CAR	Corrective Action Request
CBB	Contract Budget Base
CCB	Change Control Board
CFO	Chief Financial Officer
CO	Contracting Officer
COR	Contracting Officer Representative
CPAF	Cost Plus Award Fee
CPD	Contract Performance Dataset
CPFF	Cost Plus Fixed Fee
CPI	Cost Performance Index
CPIF	Cost Plus Incentive Fee
CR	Compliance Review
CV	Cost Variance
CWBS	Contract Work Breakdown Structure
DCMA	Defense Contract Management Agency
DM	Data Manager
DRD	Data Requirements Description
EIA	Electronic Industries Alliance
EAC	Estimate at Completion
ETC	Estimate to Complete

Acronym	Definition
EVM	Earned Value Management
EVM FP	Earned Value Management Focal Point
EVMS	Earned Value Management System
EVMWG	Earned Value Management Working Group
FA	Formulation Agreement
FAD	Formulation Authorization Document
FAR	Federal Acquisition Regulation
FMR	Financial Management Requirements
FY	Fiscal Year
GAO	Government Accountability Office
GFP	Government Furnished Property
IBR	Integrated Baseline Review
IMS	Integrated Master Schedule
IPMDAR	Integrated Program Management Data and Analysis Report
IPMR	Integrated Program Management Report
IPT	Integrated Product Team
IT	Information Technology
JPL	Jet Propulsion Laboratory
KDP	Key Decision Point
LCR	Life Cycle Review
LOE	Level of Effort
MDAA	Mission Directorate Associate Administrator
MOU	Memorandum of Understanding
MR	Management Reserve
NASA	National Aeronautics and Space Administration
NDIA	National Defense Industry Association
NFS	NASA FAR Supplement
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
OBS	Organization Breakdown Structure
OCFO	Office of the Chief Financial Officer

Acronym	Definition
OMB	Office of Management and Budget
OP	Office of Procurement
OPR	Office of Primary Responsibilities
OTS	Over Target Schedule
PBB	Project Budget Base
PDR	Preliminary Design Review
PM	Project Manager
PMB	Performance Measurement Baseline
PPBE	Program, Planning, Budgeting and Execution
RAM	Responsibility Assignment Matrix
RFP	Request for Proposal
SEB	Source Evaluation Board
SOW	Statement of Work
SP	Special Publication
SPD	Schedule Performance Data Set
SPI	Schedule Performance Index
SV	Schedule Variance
TAB	Total Allocated Budget
TCPI	To Complete Performance Index
UB	Undistributed Budget
UFE	Unallocated Future Expense
VAC	Variance at Completion
WAD	Work Authorization Document
WBS	Work Breakdown Structure

APPENDIX G: GLOSSARY

Actual Cost of Work Performed (ACWP). The costs actually incurred and recorded in accomplishing the work performed within a given time period. Actual costs include the direct cost plus the related indirect cost such as overhead, general and administrative, etc. allocated to the activity. (Also known as Actual Cost). Actual cost may also include estimated actuals, which are values entered into the EVMS to represent direct costs for material and subcontracted items for which earned value has been taken but invoices or billings have not entered the accounting system.

Administrative Contracting Officer (ACO). The individual within the Defense Contract Management Agency (DCMA) Contract Management Office (CMO) responsible for ensuring that the functions described in NFS 1842.302 are completed by the contractor in accordance with the terms and conditions of the contract.

Agency Baseline Commitment (ABC). An Agency Baseline Commitment is the highest-level commitment for NASA and is established at the beginning of the Implementation Phase of a program or project's life cycle, Key Decision Point C (KDP C). It includes the program's approved funding budgetary target. This target is used by OMB and Congress as the total appropriation target value for the funding request and some additional Unallocated Future Expense (UFE), and/or schedule or margin/reserve to ensure a reasonable amount of funding margin/reserve is available for unforeseen problems beyond the program's control.

Authorized Unpriced Work (AUW). Any effort for which contractually definitized costs have not been agreed upon, but for which written authorization has been received.

Budget at Completion (BAC). The sum of all budgets (BCWS) allocated to the project or a given Control Account.

Budgeted Cost for Work Performed (BCWP). The sum of budgets for completed work packages and partially completed work packages, plus the appropriate portion of the budgets for level of effort and apportioned effort work packages. (Also known as Earned Value)

Budgeted Cost for Work Scheduled (BCWS). The sum of the budgets for all work packages, planning packages, etc., scheduled to be accomplished (including in-process work packages), plus the amount of level of effort and apportioned effort scheduled to be accomplished within a given time period. This is the value of planned work. (Also known as Planned Value)

Change Control Board (CCB). The CCB is a committee that makes decisions on whether proposed changes to project baselines (technical, schedule or cost) should be accepted.

Contract. A mutually binding legal relationship obligating the seller to furnish the supplies or services (including construction) and the buyer to pay for them. It includes all types of commitments that obligate the Government to an expenditure of appropriated funds and that, except as otherwise authorized, are in writing. In addition to bilateral instruments, contracts include (but are not limited to) awards and notices of awards; job orders or task letters issued under basic ordering agreements; letter contracts; orders, such as purchase orders, under which the contract becomes effective by written acceptance or performance; and bilateral contract modifications. Contracts do not include grants and cooperative agreements.

Contract Budget Base (CBB). The sum of the negotiated contract cost plus the estimated cost of authorized unpriced work. It includes the PMB and MR. Customer approval is generally required to change it. (See also Project Budget Base.)

Contract Work Breakdown Structure (CWBS). A work breakdown structure of the products or services to be furnished under contract. It is comprised of selected Project WBS elements specified in the contractual document and the contractor's lower-level extensions of those elements.

Control Account. An identified intersection of the Work Breakdown Structure (WBS) and Organizational Breakdown Structure (OBS) at which responsibility for work is assigned to one organizational unit and actual direct labor, material, and other direct costs (ODC) are compared with the planned budget and the earned value for management control.

Control Account Manager. A NASA manager responsible for task performance of a Control Account within the PMB and for planning and managing the resources authorized to accomplish such task. [formerly known as Project Control Account Manager (P-CAM).

Control Account Plan (CAP). A format upon which a control account plan is displayed. A CAP typically displays the control account scope and budget in time-phased work packages and planning packages, cost element visibility, earned value techniques for each work package, responsible performing organizations start/finish (baseline/forecast/actual) and at least one charge number.

Corrective Action Plan (CAP). Documents action(s) required to resolve deficiencies.

Corrective Action Request (CAR). Documents deficiencies that require corrective action.

Cost Performance Index (CPI). A measure of cost efficiency. It compares BCWP to the actual cost to perform that work (CPI = BCWP / ACWP). An index of 1.0 means that we are spending exactly what we planned to spend to accomplish the work performed. CPI > 1.0 means we are under running costs. CPI < 1.0 means that we are over running costs.

Cost Variance (CV). A metric for the cost performance derived from earned value data. It is the algebraic difference between earned value and actual cost (CV = BCWP – ACWP). A positive value indicates a favorable condition and a negative value indicates an unfavorable condition. It may be expressed as a value for a specific period of time or cumulative to date.

Critical Path. A sequential path of tasks in a network schedule that represents the longest overall duration from “time now” through project completion. Any slippage of the tasks in the CP will increase the project duration. CP is the sequence of activities that are tied together with network logic that have the longest overall duration from time now until project completion. *Data Requirements Description (DRD).* The document that describes the specific data required for supplier/contract management and reporting.

Defense Contract Management Agency (DCMA). The Department of Defense (DoD) component that works directly with Defense suppliers to help ensure that DoD, Federal, and allied government supplies, and services are delivered on time, at projected cost, and meet all performance requirements. As the DoD Executive Agent for EVMS, DCMA is responsible for ensuring the integrity and application effectiveness of contractor EVMS. The NASA Program/Project contracting officer will normally delegate the responsibility for verifying a supplier’s initial and continuing compliance with EIA-748 guidelines to the designated DCMA

Administrating Contracting Officer (ACO) assigned to a DCMA Contract Management Office (CMO).

Earned Value Management (EVM). A project management approach for measuring and assessing project performance through the integration of technical scope with schedule and cost objectives during the execution of the project. EVM provides quantification of technical progress with objective performance measurement techniques, enabling management to gain insight into project status and project completion costs and schedules. Two essential characteristics of successful EVM are EVM system data integrity and carefully targeted monthly EVM data analyses (e.g., identification of risky WBS elements).

Earned Value Management Focal Point (EVM FP). The EVM Subject Matter Expert at each NASA Center/organization that serves as the point of contact for coordination and exchange of information on EVM. The EVM FP is responsible for effective policy implementation within their component, ensuring consistency with NASA policy and the provisions of this guide.

Earned Value Technique (EVT). See Performance Measurement Technique (PMT).

Earned Value Working Group (EVMWG). A group consisting of the EVM Subject Matter Experts from each Center and other organizations to facilitate Agency-wide communication, consistency, and lessons learned related to implementing and using EVM.

Earned Value Management System (EVMS). The integrated set of policies, processes, systems and practices that meet an organization's implementation of EIA-748. An integrated management system and its related subsystems that allow for planning all work scope to completion; assignment of authority and responsibility at the work performance level; integration of the cost, schedule, and technical aspects of the work into a detailed baseline plan; objective measurement of progress (earned value) at the work performance level; accumulation and assignment of actual costs; analysis of variances from plans; summarization and reporting of performance data to higher levels of management for action; forecast of achievement of milestones and completion of events; forecast of final costs; and disciplined baseline maintenance and incorporation of baseline revisions in a timely manner.

Electronic Industries Alliance (EIA)-748, Earned Value Management Systems Standard. The set of 32 guidelines that define the requirements an organization's EVM system should meet.

Estimate at Completion (EAC). A value (expressed in dollars and/or hours) developed to represent a realistic projection of the final cost of a task (or group of tasks) when completed. EAC is the sum of direct and indirect costs to date, plus the estimate of costs for all authorized remaining work. EAC = Inception to date ACWP + ETC

Estimate to Complete (ETC). A value (expressed in dollars and/or hours) developed to represent a realistic projection of the "to go" cost of the unaccomplished work to complete a task.

Formulation Authorization Document (FAD). The document issued by the MDAA to authorize the formulation of a program whose goals will fulfill part of the Agency's Strategic Plan and Mission Directorate strategies and establish the expectations and constraints for activity in the Formulation Phase. In addition, a FAD or equivalent is used to authorize the formulation of a project.

Independent Estimate at Completion (IEAC). The IEAC is a forecast of most likely total project costs based on assessment of historical project performance.

Integrated Baseline Review (IBR). A risk-based review conducted by Program/Project Management to ensure mutual understanding between the customer and supplier of the risks inherent in the supplier's PMB and to ensure the PMB is realistic for accomplishing all the authorized work within the authorized schedule and budget.

Integrated Master Schedule (IMS). An integrated schedule developed by logically networking all detailed program/project activities. The highest-level schedule is the Master Schedule supported by Intermediate Level Schedules and by lowest level detail schedules. See IPMDAR.

Integrated Program Management Data and Analysis Report (IPMDAR). The standard report format to communicate program/project monthly cost/schedule performance and status between a contractor and the Government. The IPMDAR consists of five files that provide program/project managers information to: integrate cost and schedule performance data with technical performance measures, identify the magnitude and impact of actual and potential problem areas causing significant cost and schedule variances, forecast schedule completions, and provide valid, timely program/project status information to higher management for effective decision making.

The files consist of:

- Contract Performance Dataset (CPD) - provides data to measure contract performance by product-oriented WBS elements (and below to CA or WP), the hardware, software, and services the Government is buying
- Schedule Performance Dataset (SPD) - provides data to measure schedule performance by product-oriented WBS elements (and below to CA or WP), the hardware, software, and services the Government is buying
- IMS Data Dictionary – maps the fields used in the native IMS to the SPD File Format Specification listed fields
- IMS native file – provides the schedule in native format (e.g., Primavera or Microsoft Project)
- Performance Narrative Report - is a narrative report used to explain significant cost and schedule variances and other identified contract problems and topics

Integrated Program Management Report (IPMR). The standard report format to communicate program/project monthly cost/schedule performance and status between a contractor and the Government. The IPMR consists of seven report formats that provide program/project managers information to: integrate cost and schedule performance data with technical performance measures, identify the magnitude and impact of actual and potential problem areas causing significant cost and schedule variances, forecast schedule completions, and provide valid, timely program/project status information to higher management for effective decision making.

The formats consist of:

- Format 1- provides data to measure cost and schedule performance by product-oriented WBS elements, the hardware, software, and services the Government is buying.
- Format 2- provides the same data by the contractor's organization (functional or Integrated Product Team (IPT) structure).
- Format 3- provides the budget baseline plan against which performance is measured.

- Format 4- provides staffing forecasts for correlation with the budget plan and cost estimates.
- Format 5- is a narrative report used to explain significant cost and schedule variances and other identified contract problems and topics.
- Format 6- Integrated Master Schedule (IMS).
- Format 7- time-phased historical and forecast cost submission. This is a contract data requirement when EVM is required.

Key Decision Point (KDP). The event at which the decision authority determines the readiness of a program/project to progress to the next phase of the life cycle (or to the next KDP).

Level of Effort (LOE): Work that does not result in a final deliverable (i.e., liaison, coordination, management, or other support activities), and which cannot be directly associated with a definable end product. It is measured "automatically by the passage of time" in terms of resources planned within a given fiscal period. With LOE effort, BCWP is always equal to BCWS.

Management Reserve (MR). An amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or a set of tasks. It is not part of the Performance Measurement Baseline.

Memorandum of Understanding (MOU). The MOU is a bilateral or multilateral document describing the agreements between two parties.

Metadata Manager (MdM). Metadata Manager houses the WBS structure and supplies this information to the Core Financial System and other subsystems such as WebTADS, FedTraveler, and Contract Management.

Mission Directorate Associate Administrator (MDAA). Responsible for managing programs within the Mission Directorate; recommends the assignment of programs and Category 1 projects to Centers; assigns Category 2 and 3 projects to Centers; serves as the KDP Decision Authority for Category 2 and 3 projects; and has responsibility for all programmatic requirements.

NASA Procedural Requirements (NPR). Agency mandatory instructions and requirements to implement NASA policy as delineated in an associated NPD.

NASA Policy Directive (NPD). Agency policy statements that describe what is required by NASA management to achieve NASA's vision, mission, and external mandates and describe who is responsible for carrying out those statements.

NASA Structure Management (NSM). The NSM is the internal coding schema used by the Agency to define and organize project work content. The WBS with its NSM nomenclature provides a common management framework for project management decisions and communication, the definition and authorization of work, the development of project schedules, and the planning and allocation of resources. This same coding system is also used to account for all financial activities associated with funds appropriated by Congress to accomplish project work.

Office of Chief Financial Officer (OCFO). The OCFO provides leadership for the planning, analysis, justification, control, and reporting of all Agency fiscal resources. The OCFO is responsible for EVM policy and guidance.

Office of Management and Budget (OMB). A Cabinet-level office which is the largest office within the Executive Office of the United States President. The OMB oversees and coordinates the Administration's procurement, financial management, information, and regulatory policies. In each of these areas, the OMB's role is to help improve administrative management, to develop better performance measures and coordinating mechanisms, and to reduce any unnecessary burdens on the public.

Office of Procurement (OP). The Office of Procurement provides functional management, leadership, and policy direction of procurement and financial assistance activities (excluding Space Act Agreements) for the entire Agency.

Organizational Breakdown Structure (OBS). The project hierarchy of line and functional organizations as applied to the specific project.

Over Target Baseline (OTB). A budgeted amount above the Project Budget Base/ CBB. The OTB term is used to describe the condition when the total allocated budget (TAB) exceeds the PBB/CBB. It is the end result of a formal reprogramming process. *Over Target Schedule (OTS).* An established schedule that extends beyond the contractual milestones or delivery dates. It is the end result of a formal reprogramming process.

Performance Measurement Baseline (PMB). The time-phased budget plan for accomplishing all authorized work scope in a project's life cycle, which includes both NASA internal costs and supplier costs. The PMB is used to measure project performance using earned value management, if required, or other performance measurement techniques if EVM is not required. It is formed by the budgets assigned to scheduled control accounts and the applicable indirect budgets. For future effort, not planned to the control account level, the PMB also includes budgets assigned to higher level WBS elements and undistributed budgets. The PMB does not include UFE, or management reserve (MR) for contractors.

Performance Measurement Technique (PMT). The method or "algorithm" used to calculate earned value at the work package level.

Planning Package (PP). A logical aggregate of far-term effort within a control account that can be identified and budgeted but not yet defined into discrete Work Packages.

Program. A strategic investment by a Mission Directorate or Mission Support Office that has a defined architecture and/or technical approach, requirements, funding level, and a management structure that initiates and directs one or more projects. A program defines a strategic direction that the Agency has identified as critical.

Program Plan. The document that establishes the program's baseline for implementation and is signed by the MDAA, Center Director(s), and program manager.

Project. A specific investment having defined goals, objectives, requirements, life-cycle cost, a beginning, and an end. A project yields new or revised products or services that directly address NASA's strategic needs. They may be performed wholly In-house; by Government, industry, academic partnerships; or through contracts with private industry.

Project Budget Base (PBB). The negotiated value of the project plus the estimated cost of authorized unpriced work. It is the Government project equivalent to the Contract Budget Base. It includes the PMB and MR. Customer approval is generally required to change it.

Project Control Account Manager (P-CAM). See Control Account Manager.

Project Plan. A detailed plan which, when formally approved, sets forth the agreement between a Program Manager and Project Managers, and defines the guidelines and constraints under which the project will be executed.

Reciprocity. A reciprocal arrangement or relationship which allows two or more groups to agree to the acceptance of another organizations' EVMS, thereby reducing the burden of multiple reviews by individual groups.

Request for Proposal (RFP). A solicitation used in negotiated acquisitions to communicate government requirements to prospective contractors and solicit proposals.

Responsibility Assignment Matrix (RAM). A matrix showing the relationship between the WBS elements, and the organizations assigned responsibility for ensuring their accomplishment. The RAM normally depicts the assignment of each control account to a single manager. When resource values are applied to these relationships, it may be referred to as a dollarized RAM.

Risk Management Plan (RMP). The document that describes how risks will be identified and managed for a specific program/project.

Schedule Performance Index (SPI). A measure of schedule efficiency. It compares the BCWP to the work scheduled (SPI = BCWP / BCWS). An index of 1.0 means the work is being performed right to the schedule. SPI > 1.0 means that the work is ahead of schedule. SPI < 1.0 means that the work is behind schedule.

Schedule Variance (SV). A metric for the schedule performance derived from earned value data. It is the algebraic difference between earned value and the planned value (SV = BCWP – BCWS). A positive value is a favorable condition while a negative value is unfavorable. It may be expressed for a specific period of time or cumulative to date.

Statement of Work (SOW). A document that contains a narrative description of the work scope requirements for a project or contract.

Suppliers. Each project office is a customer having a unique, multi-tiered hierarchy of suppliers to provide it products and services. A supplier may be a contractor, grantee, another NASA Center, university, international partner, or other government agency. Each project supplier is also a customer if it has authorized work to a supplier lower in the hierarchy.

To Complete Performance Index (TCPI). The future cost efficiency needed to accomplish the remaining work within a financial goal such as the Budget at Completion (BAC) or the Estimate at Completion (EAC). It compares the budget for remaining work with the remaining cost or the estimated remaining cost to complete the work. TCPIBAC = (BAC – BCWP cum) / (BAC – ACWP cum). Or TCPIEAC = (BAC – BCWP cum) / (EAC – ACWP cum). Compare the CPI to determine if the BAC or the EAC is realistic or not.

Total Allocated Budget (TAB). The sum of all budgets allocated to a project/contract. Total allocated budget consists of the PMB and all MR. The TAB should reconcile directly to the

PBB/CBB. If the TAB is greater than the CBB/PBB, the difference is attributable to an over target baseline and must be documented.

Unallocated Future Expense (UFE). The portion of estimated cost required to meet specified JCL that cannot yet be allocated to the specific project WBS sub-elements because the estimate includes probabilistic risks and specific needs that are not known until these risks are realized. Typically not part of PBB unless allocated to the project in conjunction with a formal change to the PBB.

Undistributed Budget (UB). Budget associated with specific work scope or authorized changes that have not been assigned to a control account or summary level planning package.

Work Authorization Document (WAD). A form used to document authorized and budgeted work from the Project Manager or sub-project/element manager. As a minimum this document must include the relevant WBS Control Account code, SOW, scheduled start and completion dates, budget, and the name of the CAM.

Work Breakdown Structure (WBS). A product-oriented hierarchical division of the hardware, software, services, and data required to produce the program's or project's end product(s), structured according to the way the work will be performed and reflecting the way in which program/project costs and schedule, technical, and risk data are to be accumulated, summarized, and reported.

Work Package (WP). A detail, short duration task or material item identified by the Project Control Account manager for accomplishing a control account task. A work package has the following characteristics:

- Represents unit of work at the level where work is performed.
- Clearly separate from other Work Packages.
- Assignable to a single organizational element.
- Has scheduled start and completion dates, and interim milestones, if required, all of which represent physical accomplishment.
- Has budget expressed in terms of dollars or hours/FTEs.
- Its duration is limited to a relatively short span.
- Is integrated with detailed engineering, shop, or other schedules.
- Has a correct Earned Value Technique assigned to it.

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