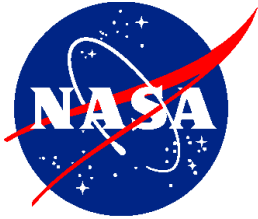


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# **Integrated Baseline Review (IBR) Handbook**

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

**November 2021**

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## **P.0 PREFACE**

### **P.1 Purpose**

The purpose of this handbook is intended to be a how-to guide to prepare for, conduct, and close-out an Integrated Baseline Review (IBR). It discusses the steps that should be considered, describes roles and responsibilities, tips for tailoring the IBR based on risk, cost, management insight benefits, and provides lessons learned from past IBRs. The appendices contain example documentation typically used in connection with an IBR. Note: Appendices are examples only, and should be tailored to meet the needs of individual projects and contracts.

Following the guidance in this handbook will help customers and suppliers preparing for an IBR understand the expectations of the IBR, and ensure that the IBR meets the requirements for both in-house and contract efforts.

### **P.2 Applicability**

The objectives of an IBR are applicable and beneficial to projects and contracts of all sizes and types. However, the level of detail and formality of the review vary based on dollar value, risk, and need for management insight. The Mission Directorate may impose unique guidelines for the IBR.

NASA has many reviews during the program and project lifecycles, and some of these reviews share common goals and objectives with an IBR. Therefore, when possible, the IBR can be combined with these other reviews. It is important to ensure that the intent of the IBR is still met with adequate time, and supported by key personnel when reviews are consolidated. The IBR Team Leader should determine if the Decision Authority or Technical Authority have prepared a Terms of Reference (ToR) for the project. The IBR should be consistent with the ToR and assure that an adequate level of detailed information and analysis is provided to the Decision Authority and Technical Authority. The duration of the IBR is determined by adequately allowing time to cover 85% of the total value (control accounts), including all high dollar and high risk control accounts, control accounts on the critical path, and reviewing material and Level of Effort (LOE) control accounts as time permits to ensure adequate coverage of the baseline.

### **P.3 Authority**

This handbook provides Earned Value Management (EVM) guidance for NASA Headquarters, NASA Centers, the Jet Propulsion Laboratory (JPL), government partners, academic institutions, international partners, and contractors to the extent specified in the contract or agreement.

The following provide more information on EVM policy and requirements:

- NASA Federal Acquisition Regulation Supplement (NFS) 1834.201, *Earned Value Management System Policy*
- 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/Project Management Requirements*
- NPR 7120.7, *NASA Information Technology and Institutional Infrastructure Program and Project Management Requirements*
- NPR 7120.8, *NASA Research and Technology Program and Project Management Requirements*

## P.4 Terminology Context

This handbook serves two roles regarding contractor IBRs and in-house project IBRs. Rather than confusing the terminology, 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 most oftentimes the NASA Mission Directorate, program, or project. 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 whereas the MD or program conducts the IBR. The project office will conduct the IBR for contractor, grantee, university, international partner, or other government agency since they are external to NASA. The Control Account Manager, “CAM” acronym herein refers to both the government, Project-Control Account Manager “P-CAM” and industry CAM in regards to EVM.

## P.5 References

- NASA EVM website, <https://nasa.gov/evm/>
- NFS, <https://www.hq.nasa.gov/office/procurement/regs/NFS.pdf>
- NASA Engineering Network (NEN), Program/Project Management, EVM Sub-Community, <https://nen.nasa.gov/web/pm/evm> (inside the NASA firewall only)
- *NASA Schedule Management Handbook*
- *NASA Space Flight Program and Project Management Handbook*
- *NASA Work Breakdown Structure (WBS) Handbook*
- *NASA Earned Value Management Implementation Handbook*
- *NASA Earned Value Management System Description*
- *NASA Earned Value Management, Reference Guide for Project-Control Account Managers*
- Electronic Industries Alliance Standard (EIA-748), *Earned Value Management Systems*
- National Defense Industrial Association (NDIA) Integrated Program Management Division, *Guide to the Integrated Baseline Review (IBR)*, Revision 3, 11 September, 2019
- DoD Earned Value Management System Implementation Guide (EVMSIG), 14 March 2019
- DoD Earned Value Management Implementation Guide (EVMIG), 18 January 2019

## **P.6 Point of Contact**

The primary point of contact for this handbook is NASA's EVM Program Executive, Jon Fleming, from the Office of Strategic Analysis and Communications, Marshall Space Flight Center, (256) 544-0137, [jon.f.fleming@nasa.gov](mailto:jon.f.fleming@nasa.gov).

Organizational EVM Focal Points (EVMFPs) may also be consulted for assistance with EVM/IBR support. The listing of applicable EVMFPs is located on the NASA EVM website, <https://www.nasa.gov/evm/evmwg>.

## 1.0 INTRODUCTION

### 1.1 Background

The purpose of the IBR is to achieve a mutual understanding of the baseline plan and its relationship to the underlying Earned Value Management System (EVMS) and processes that will operate during the life cycle of a project. 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. This will be accomplished by evaluating the Performance Measurement Baseline (PMB) to ensure it captures the entire technical scope of work, is consistent with schedule requirements, has adequate resources assigned, and has sound management processes.

According to NPR 7120.5, an IBR is defined as a risk-based review conducted by program/project management to ensure a mutual understanding between the customer and supplier of the risks inherent in the supplier's PMB and to ensure that the PMB is realistic for accomplishing all of the authorized work within the authorized schedule and budget.

The PMB is defined as the time-phased cost plan for accomplishing all authorized work scope in a project's life cycle, which includes both NASA internal costs and supplier costs. The project's performance against the PMB is measured using EVM, if required, or other Performance Measurement Techniques (PMTs), if EVM is not required. The PMB does not include Management Reserve (MR) or Unallocated Future Expense (UFE).

Integrated Baseline Reviews (IBRs) are required whenever Earned Value Management (EVM) is required:

- For contracts, IBRs will typically be conducted within 180 calendar days after contract award (if a pre-award IBR has not been conducted), or exercise of significant options, or within 60 calendar days after incorporation of major modifications. (NFS 1834.201 and 1852.234-2), including but not limited to: funding realignments, significant scope change which increases or decreases the Performance Measurement Baseline (PMB), negotiated equitable adjustments resulting from the issuance of a change order, or reflect other agreements of the parties modifying the terms of the contract. (NFS 1843.205 and FAR 43.103)
- Mission Directorates shall conduct an IBR in preparation for KDP C and for major changes that significantly impact the cost and schedule baseline. For contracts, refer to the NASA FAR Supplement for IBR requirements.

IBRs are required when the PMB is first established, and whenever changes to the baseline (e.g. to scope, or to the parties' understanding of the risks, work, schedule or budget) become significant enough that a new mutual understanding is needed. Over-target schedule (OTS) / over-target baseline (OTB), are approved through contract modifications and would necessitate an IBR. The project phase is not a consideration.

While risks may be identified and actions tracked as a result of the IBR, it is important to note that an IBR is not a pass/fail event. Completion is contingent on meeting the IBR objectives. Delta IBRs



are typically the result of poor planning (i.e., incomplete/immature cost, schedule, technical content of the PMB, lack of training, inexperienced staff, etc.). Thus, it is paramount that the customer ensures the supplier's readiness to conduct an IBR upfront in accordance with Section 2.5. In addition, during the overall IBR, CAMs are not graded (or color-coded) since the IBR is not a pass/fail event. However, the five risk areas have evaluation criteria (colored coded) as mentioned later in this handbook (Appendix H) .

The objectives and benefits of the IBR are to:

- Promote customer and supplier knowledge of the PMB;
- Improve communications by enabling a comparison of customer and supplier understanding of technical/schedule/cost objectives and identification of any differences so they can be addressed;
- Determine that the PMB covers the entire scope of work, is realistic, and supports achieving all technical/schedule/cost objectives;
- Provide a thorough understanding of the PMB and its risks, enabling early intervention to mitigate risks, and to exploit opportunities;
- Verify that technical performance goals or functional exit criteria are clearly defined, agreed upon, and documented;
- Ensure meaningful and reliable performance measurement techniques are employed;
- Assess the PMB ability to provide timely, reliable, and actionable schedule, cost, scope, and risk for decision making;
- Provide the Customer with an understanding of the supplier's processes for effective and integrated technical/schedule/cost management and measurement.

An IBR is part of the supplier's management processes. Anything that does not support the intent of the IBR should be moved outside the review. Any risks associated with technical, schedule, cost, resource, and management processes that are identified during the IBR should be reviewed and incorporated into the project's existing risk management process.

## **2.0 IBR PREPARATION**

### **2.1 General**

Preparation is the foundation for a meaningful IBR. The preparation portion of the IBR is the most important part of the entire process. Preparation includes the planning that identifies key responsibilities, required technical expertise, IBR and/or EVM training, review dates, review scope, risk evaluation criteria, documentation needs, and disposition of findings. It also includes reviewing the procedures for risk identification, documentation, and incorporation into the project's risk management planning.

The IBR process will include the activities listed below.

- A review of the documentation that establishes the current and baseline plan will occur prior to and during the IBR. This will include technical scope, cost estimates to complete (ETCs), basis of estimates, budgets, resource plans, schedules, PMTs, etc. Findings/Action Items will be generated and submitted as a result of the IBR and supplier's IBRs findings.
- IBR training to familiarize the review team with the IBR process, purpose, and documentation. Also, a supplier discussion regarding expectations of the IBR is recommended.
- A short in-brief by the customer/supplier consisting of the project overview, intent of the on-site review, agenda, and a discussion of the business/EVM process.
- Discussions with selected CAMs to verify the adequacy and risk related to work authorizations, budgets, ETCs, current and baseline schedules, etc.
- Sub-team evaluations, risk assessments, action items, and preparation of findings required and team meetings (caucuses) to discuss results of the CAM discussions.
- An out-brief by the customer to the supplier covering the results and Findings/Action Items of the IBR.

### **2.2 Determination of IBR Need**

The need for an IBR on contract(s) must be determined early during the Formulation Phase and included in any Requests for Proposals (RFPs). Identification of IBR requirements on in-house work should be identified within the program and project plan. The requirement for contract IBRs is contained in NFS Part 1852. The requirement for IBRs is contained in NPR 7120.5. In addition, the mission directorate may establish unique IBR requirements and thresholds that must be followed. The project plan should identify the contracts and in-house work that will require an IBR, including flow-down of IBR requirements to major subcontractors. An IBR may also be planned for efforts that do not meet the dollar thresholds in 7120.5, but that have significant risk or require more management attention at the discretion of the Program and/or Project Manager.

Including the clause at NASA FAR Supplement (NFS) 1852.234-2 in a solicitation will notify potential bidders of NASA's intent to conduct IBRs. In addition to that clause, or in a case where the clause is not included in the RFP or contract, it is a good idea to provide suppliers with more details about the expectations of the IBR in the Statement of Work (SOW). This will ensure that clear expectations are established and provide NASA the ability to tailor IBR requirements.

## 2.3 IBR Planning

The customer should begin preparation for the IBR as soon as practical after determining the need. The Program or Project Manager should appoint an IBR Coordinator and a Review Facilitator early to help plan and conduct the IBR. The IBR Coordinator helps coordinate various activities to ensure an efficient IBR. The Review Facilitator provides EVM expertise to the team. The roles of the IBR Coordinator and Review Facilitator are further described below. See [Appendix B](#) for a checklist of IBR activities.

The first step in planning the IBR is to determine which Control Accounts (CAs) will be reviewed at the IBR. A Responsibility Assignment Matrix (RAM) that shows the budget separately broken out for each CA will help in this assessment. See [Appendix C](#) for a sample dollarized RAM. The dollarized RAM or equivalent document must be requested from the supplier early on to help with the planning. 85% of the total dollar value (control accounts) are to be reviewed, which includes all high dollar, high risk control accounts, and those on the critical path. Usually, at least one LOE and one material account will be included to provide insight into various aspects of the project. The Program or Project Manager, with advice from the Review Facilitator, should choose the CAs for the IBR and inform the supplier of the ones selected. This will also form the basis of the IBR agenda. See [Appendix D](#) for an example agenda.

Team composition and assignments are based on which CAs are selected for review. Participants should be identified based on their expertise as required for the review. These disciplines include program and project management, business management, procurement and technical management (e.g., system engineering, software engineering, manufacturing, integration and test engineering, and integrated logistics support). When appropriate, the team may include subcontractor, Defense Contract Management Agency (DCMA), and Defense Contract Audit Agency (DCAA) personnel. There may be several sub-teams with discussions scheduled concurrently, or one team may hold discussions with every CAM. Each of these teams should be assigned a sub-team leader to lead the discussion. To be effective, the discussion group should remain small and focused, usually 3-4 people per team. Typically, the technical leads (CAM counterparts) for NASA will lead the discussion. A sample team may consist of an EVM analyst, scheduler, business office rep and one or two technical experts in the area of the CA to be discussed. A good rule of thumb is to allow at least two hours to conduct the CAM discussions and one hour for completing documentation.

## 2.4 Customer Team Roles and Responsibilities

The IBR Team is a multi-functional team approach that affords the opportunity to leverage knowledge and experience in the areas of technical, cost, schedule, and risk to ensure all areas are addressed during the IBR. Team members are expected to:

- Attend and participate in meetings;
- Attend training sessions to prepare for the documentation review;
- Attend on-site/in-house review;
- Become familiar with the contractor's and/or in-house project's control account documentation and any other supplementary information provided;

- Understand assigned roles and responsibilities in the review and be willing to carry out these responsibilities;
- Prepare and submit findings in a timely manner. Ensure that all findings are documented by factual evidence;
- Assist the Team Leader in the preparation of the out-brief and final report.

**Program or Project Manager (PM)/Team Leader:** The PM either acts as or assigns the Team Leader for the IBR. The overall responsibility of conducting the IBR lies with the Team Leader. The Team Leader is responsible for coordinating the activities of all individuals assigned to perform the review. Some individual tasks to be performed by the Team Leader are described below.

- Coordinate with the supplier to discuss the IBR strategy, areas to be reviewed, and tentative dates for the IBR.
- Choose appropriate team members and assign responsibilities.
- Ensure team members are adequately trained and prepared.
- Provide technical direction and leadership emphasizing the importance of thorough cost, schedule and technical integration of work.
- Provide an in-brief and out-brief at the IBR.
- Provide an overall evaluation (not a color rating) of the IBR and assess whether or not a follow-on review will be required.
- Approve review Findings. The format of this documentation is at the discretion of the Team Leader.
- Ensure that all issues identified during the review are resolved in an appropriate and timely manner.
- Assign action items and completion dates to appropriate customer and supplier personnel. Schedule action item review as necessary.
- Define the risk evaluation criteria to generally categorize the risk that may be identified at an IBR: cost, schedule, technical, resource, and management processes. This is part of the out-brief presentation.
- Attend CAM Discussions as their schedule permits. Typically, Team Leaders spend most of their time with supplier management personnel.

**IBR Coordinator:** The Team Leader may appoint an individual as IBR Coordinator whose function entails coordination of various activities to ensure an efficient IBR. This includes, but is not limited to, coordinating review dates, obtaining and organizing information necessary for the review, and coordinating the various aspects among the customer and supplier review participants. The following is a recommended guide to assist the coordinator in performing this role:

- Assist Team Leader to coordinate the review dates that are amenable to all parties. Consideration should be given to a time period that is the least disruptive to ongoing activities. Scheduling the review after the product submissions are received after the close of the accounting period is normally the most appropriate time.
- Provide written notification of the IBR to the supplier, if applicable. Send the letter to all of the team members for informational purposes. In the case of a contract IBR, typically the contracting officer would send the notification letter. See [Appendix A](#) for a sample IBR Notification Letter.
- Obtain a list of the IBR team members from the Team Leader.

- Coordinate with individual team members to ensure travel and security arrangements have been accomplished. If possible, non-escort badges for the IBR Team.
- Ensure supplier has adequate meeting space, projectors, phone, internet, etc.
- Collect information and data requested in the IBR notification letter; compile and sort the information by sub-team responsibilities; and make this information available to the IBR team members.
- Assist Team Leader by coordinating IBR/EVM training for the team members; if necessary invite the supplier team. At least make the supplier aware of the expectations and location of the NASA IBR Handbook so there are no surprises.
- Schedule an IBR kick-off meeting to allow team members to familiarize themselves with the documentation and develop questions to be addressed during the review.
- Coordinate a location for the files to be accessed by the team (Network drive, SharePoint, etc.) Team members should ensure they have access to the data, copy to their laptops, or print. Along with their specific questions based on their analysis, the team should also have these items available:
  - Agenda/Discussion Schedule
  - Team Assignments
  - Statement of Work/Project Plan
  - WBS & WBS Dictionary
  - Organization Breakdown Structure (OBS)
  - Dollarized RAM
  - CAM Findings
  - Integrated Master Schedule (IMS) and Findings (i.e., Health Check)
  - EVMS System Description/Implementation Plan
  - Discussion Guidelines
  - Sample CAM Questions
  - Documentation Guidelines
  - Sample Documentation
  - Risks and Risk Evaluation Criteria
- Document the IBR Findings/Action Items. Forward those deemed appropriate by the Team Leader to the supplier for resolution.
- Distribute IBR forms, electronic format, to team members prior to CAM discussions.
- Collect documentation at the IBR.
- Establish and maintain an IBR log.
- Participate in CAM Discussions.

**Review Facilitator:** Duties and responsibilities of the IBR Review Facilitator include providing the team members with EVM expertise. This is accomplished through the review of documentation, assessing earned value status, and interpreting issues that relate to overall EVM. The Review Facilitator should be an EVMFP from the applicable Center if possible. The items listed below are provided as a recommended guide to assist the facilitator in the accomplishment of this role.

- Determine status of the EVM system. If applicable, request documentation showing that the EVM system has been previously accepted by the government. When applicable, contact the local DCMA representative to determine if there are any outstanding EVMS problems that would affect the quality of the performance measurement data.

- If the EVM system requires government acceptance (validated) and has not met that requirement, coordinate with appropriate personnel the means by which this acceptance can be accomplished, and at least have a plan to become validated.
- Review management processes that will be used in the management of the work.
- Provide EVM expertise to the IBR Team by assisting team members in the understanding of any EVMS data obtained prior to the review.
- Coordinate with the Team Leader and IBR Coordinator in determining the agenda/CAM discussion schedule based on the dollarized RAM. Note: 85% of the total dollar value (control accounts) including high dollar and high-risk control accounts. If possible, include at least one LOE and one Material control account,
- Review the experience and background of the team participants and provide a recommendation to the Team Leader of the type and amount of EV training deemed necessary.
- Provide assistance to IBR Team members in determining whether individual tasks have been assigned appropriate PMTs used for measuring progress.
- Assist the Team Leader in the development of the risk evaluation criteria, if it needs to be tailored from this IBR Handbook.
- The IBR Facilitator reviews all action items generated are consolidated if necessary, and ensures that earned value issues requiring follow-up are appropriate and necessary.
- Assist the Team Leader with the preparation of both the in-brief and out-brief.
- Participate in CAM Discussions.

**Project-Control Account Manager (P-CAM) - a.k.a. Sub-team Technical Lead, CAM:** The P-CAM is normally a technical expert who specializes in the CA(s) that are being addressed during the CAM discussions. Note: The government P-CAM is equivalent to an industry CAM as mentioned in the preface. The responsibilities of the P-CAM include:

- Attend the pre-IBR meeting, including training and documentation review prior to the start of the IBR.
- Review documentation prior to baseline discussions with the CAM.
- Lead the CAM Discussions with support from their team, or participate if program-led IBR.
- Establish the strategy for conducting the CAM Discussions with their team.
- Ensure all applicable IBR documentation is properly completed (i.e. discussion assessment forms, Findings/Action Items logs, documentation request forms, and risk assessment forms).
- Support daily reviews to the entire IBR Team. Note: Supplier participation is at the discretion of the Team Leader.
- Provide an assessment of risk based on the prescribed risk evaluation criteria.
- Assist in the preparation of the IBR out-brief, if necessary.

**Subject Matter Expert (SME) Team Members:** Team members may include technical experts, EVM analysts, procurement representatives, business office, as well as other personnel who may participate in the CAM Discussions. Duties of team members include:

- Attend the pre-IBR meeting, including training and documentation review, prior to the start of the IBR.
- Review supplier data prior to CAM Discussions.

- Review the EVM System Description or management processes to understand the processes and procedures.
- Participate in senior management discussions, as required.
- Provide an assessment of risk based on the prescribed risk evaluation criteria.
- Assist in completing all applicable IBR documentation.
- Assist in the preparation of the IBR out-brief.

**Schedule Analyst:** The duties of the Schedule Analyst include:

- Attend the pre-IBR meeting, including training and documentation review prior to the start of the IBR.
- Review documentation prior to baseline discussions with the CAM.
- Participate in CAM and senior management discussions.
- Review the EVM System Description or management processes to understand the processes and procedures by which the IMS is created and maintained.
- Provide IMS analysis and assessment report, to include performing a schedule health check(s) and other schedule metrics. Recommend using the Deltek Acumen Fuse.
- Provide an assessment of all project risk based on the defined risk evaluation criteria.
- Assist in completing all IBR documentation.
- Assist in the preparation of the IBR out-brief.

**Cost Analyst:** The responsibilities of the Cost Analyst include:

- Attend the pre-IBR meeting, including training and documentation review prior to the start of the IBR.
- Review documentation prior to baseline discussions with the CAM.
- Provide insight into the reliability of the BOEs.
- Inform the team of any areas where the independent or non-advocate estimates differ from the customer estimates.
- Participate in CAM and senior management discussions.
- Provide an assessment of all project risk based on the defined risk evaluation criteria.
- Assist in completing all IBR documentation.
- Assist in the preparation of the IBR out-brief.

It is also important to include trainees and observers as part of the IBR process. This is a good way to provide training to people who may need to participate in future IBRs. Although, the number of attendees should be kept to a minimum to ensure CAMs are comfortable in sharing control account information.

## 2.5 Determination of Readiness

Prior to the on-site IBR, the IBR Team must assess the readiness of both the customer and supplier to conduct an IBR. Below are some rules of thumb to help determine IBR readiness.

- The PMB should reflect the entire scope of work.
- The schedules should reflect the entire scope of work.

- If possible, have at least three reporting cycles worth of EVM data before the IBR for trending purposes. This will provide the IBR Team with some performance measurement data, as well as a feel for the accuracy of the data.
- Look for detail planning to the work package level for six months to one year to ensure an adequate assessment of the baseline.
- All preliminary documentation requested in the IBR Notification Letter has been assessed to ensure the customer/supplier is ready for the on-site review. If it is determined that the requested documentation is incomplete or inadequate, the on-site IBR should be rescheduled. For supplier IBRs, keep in mind the NFS requirement to conduct a supplier IBR within 180 days of contract award. Any deviation to this must be approved by the Contracting Officer with consultation from the NASA EVM Program Executive (PE) or Deputy PE.

The IBR Team must measure the ability of the customer/supplier to meet the intended objectives prior to conducting the on-site IBR. The IBR is not just putting a check in the box and adequate time should be allocated for the IBR duration based on the number of control accounts to be reviewed and number of teams conducting CAM discussions. As discussed previously 85% of total dollar value (control accounts) are to be reviewed, which includes all high dollar, high risk, and few (at least one of each) LOE/material control accounts. If after the IBR, the Program or Project Manager does not feel that the IBR met the objectives, a delta IBR should be performed. Adequate customer/supplier preparation is essential to ensuring a meaningful IBR. This includes ensuring proper training was conducted and adequate time was allowed for the data review.

## 2.6 IBR Notification Letter/Documentation

An IBR notification letter should be prepared and sent to the supplier within three months of the scheduled on-site IBR. This notification letter can take any form but should include the following information: the purpose of the review, the timeframe of the review, the agenda, documentation requested, team requirements (example: projector, phone/internet access, meeting rooms, etc.), IBR team members and roles, and points of contact for follow-up. See [Appendix A](#) for a sample IBR notification letter. For contracts and subcontracts, the IBR notification letter should be sent from the government Contracting Officer Representative (COR) to the contractor organization. The local DCMA and DCAA organization, if applicable, should also be informed of the IBR as well.

One of the main functions of the IBR notification letter is to request documentation for use on-site and prior to the IBR, so that the team can prepare. This documentation will be used by the team to identify risk areas and to develop preliminary questions for the on-site IBR, and should be received two to four weeks prior to the on-site IBR. The following is a listing of some of the documentation that may be requested, and is not all-inclusive:

- Product-oriented WBS and WBS Dictionary to the control account level
- OBS to the CAM level
- Time-phased Control Account Plans (CAP) to include work packages, the PMT used to assess performance, period of performance dates for each work package, and the specific resources assigned to each work package. (Native file format required)
- BOE with assumptions, and risk



- Work Authorization Documents (WADs) at the control account level
- Performance measurement reports (internal cost/schedule reports)
- Estimate at Completion (EAC) with supporting documentation
- Control Account (CA)/Work Package (WP) summary containing:
  - a. Number of work packages by type of PMT
  - b. Longest CA, shortest CA, mean and median duration, total value of account
  - c. Largest CA, smallest CA, mean and median values
  - d. Percentage of discrete vs. LOE for entire project (80% discrete vs. 20% LOE is a rule of thumb based on industry best practices, but ratios will depend on the project)
- Budget Logs (MR, Undistributed Budget (UB), Contract Budget Base (CBB) or Project Budget Base (PBB), Estimated Actuals, Baseline Change Requests (BCRs)
- Project Plan with major deliverables/Statement of Work (SOW) with WBS matrix for tracing purposes
- IMS (master, intermediate, and detailed) with critical path(s) identified and schedule margin (native file format required)
- EVM System Description and Project EVM Implementation Plan
- Financial management reports such as NASA Form 533 Monthly / Quarterly or equivalent
- Integrated Program Management Reports (IPMRs) (format per the DRD deliverable)
- RAM showing budget by control account to help determine the 85% of total budgeted control accounts to be reviewed
- Subcontractor listing and value of subcontracts
- Internal re-planning documentation
- Contractor/subcontractor flow-down requirements
- Risk list from Risk Management System with mitigation plans
- Key Risks and Opportunities as defined in the Risk and Opportunity Management Plan
- EVM software tools metric analysis (i.e. Empower, Cobra, wInsight, etc.) and IMS tools metric analysis (i.e. Deltek Acumen Fuse, etc.) Schedule Risk Assessment Results
- Critical Path Identification and Analysis
- Material High/Low Dollar Threshold Breakdown
- Critical Materials List

Request only the data that has not already been received. Also, this list can be tailored based on information required for preparation and insight. The supplier may have the data described above in different formatting or names, and these documents are acceptable, but the native file formats are requested for analysis purposes. Also, make sure supplier is clear on the IBR expectations and timely submittal of all requested documentation.

Once the documentation is received, the next step is for the IBR Team to evaluate this documentation and determine risk areas. This evaluation of documentation, as well as other activities, can be conducted at a pre-IBR meeting. Again, if it is determined that the requested documentation is incomplete or inadequate the on-site IBR should be rescheduled. However, keep in mind the NFS requirement to conduct a supplier IBR within 180 days of contract award. Suppliers should know prior to contract award of NASA IBR requirements. Questions may be held

for discussion at the IBR or can be provided to the supplier prior to the IBR, allowing time to respond prior to the on-site IBR. The questions can be informal or documented. If the documentation review uncovers new risk areas, those CAs should be added to the review schedule.

## 2.7 Training

Training should be conducted at a pre-IBR meeting. The three components of the training are basic EVM, IBR, and an overview of/by the supplier. The supplier can be a great help during the pre-IBR meeting by explaining documentation and answering any preliminary team questions. The supplier personnel can also give the team an understanding of management processes, such as baseline maintenance, risk management, and other business processes including EVM, that will be used to manage the project. Note that while EVM processes are discussed at an IBR, the IBR is not an EVM compliance evaluation review.

Training may be obtained from various sources and should be tailored based upon the needs and experience of the individual members of the review team. Training sources may be found by contacting the local NASA Training Coordinator or the NASA EVMFP. Names of members and contact information are listed on the NASA EVM website at <https://www.nasa.gov/evm/evmwg>.

The training and documentation review should occur prior to the on-site IBR. This will help to ensure an efficient IBR, provide the team an opportunity to review the data for completeness, and ensure readiness of the supplier. Sufficient time needs to be allocated for team training and preparation prior to the on-site review.

## 2.8 IBR Logistics

Team members need to be informed as early as possible of the travel plans, review schedule, agenda, and their assignments. Additionally, team members should know the name and contact information of the IBR Coordinator, which should handle security arrangements needed to be made for each team member visiting a facility (i.e., Visit Requests need to be sent to the appropriate Security Office.). IBR Team members should also be provided area maps, directions to all facilities, to include buildings and rooms where the briefings and CAM Discussions will be held. (See IBR Coordinator duties for more detailed information)

A certain amount of administrative/logistics is required to ensure an efficient IBR, and this effort will benefit all stakeholders. The supplier is requested to arrange the following for the Review Team's on-site presence during the review:

- All IBR team members are cleared for any security requirements, and that arrangements are in place for them to be collected and escorted, only if necessary while on-site.
- Provide adequate working area or collaborative workspace for the IBR Team.
- Schedules for discussions with CAMs and other project management staff and ensure all personnel are available. This needs to be reconfirmed prior to the IBR in case any adjustments need to be made due CAM availability, or arrangements to hold a special CAM discussion at an alternate time if deemed vital to completing the IBR. The supplier should not notify the IBR Team at the last minute that a major CAM is unavailable.

- Conference rooms for CAM Discussions are available, supports the number of team members, and the appropriate equipment, network access, etc. is available for data traces and internet. This should be tested prior to the CAM Discussions.

## **3.0 ON-SITE IBR**

### **3.1 General**

The preparation and planning done up to this point pay off at the on-site IBR. The primary purpose is for the customer and supplier to gain a mutual understanding of the risks inherent in the PMB and management processes. Anything that does not support this purpose should be discussed outside of the IBR. Any issues that arise during the IBR that are not resolved – without impact to the scheduled on-site activities – should be recorded, and resolved after the review.

The intent of this section is to provide sample tools and documentation for conducting the on-site IBR. While each IBR may be tailored, these tools will provide a starting point for conducting the review.

### **3.2 On-site Discussions**

Once the IBR Team is on-site at the supplier's facility, several different activities occur. This section describes each of these activities and their role in making the IBR successful.

### **3.3 In-Briefs**

#### **3.3.1 Joint IBR Team and Supplier**

The IBR Team Leader should provide an in-brief to the supplier at the start of the IBR. The main theme of this discussion is to re-emphasize that the purpose of the IBR is to evaluate the achievability of the PMB, understand inherent risks, and identify Findings/Action Items, not to try to solve problems. The supplier will then provide a brief overview of the project, EVM processes, business rhythm, etc. prior to teams breaking out into their respective CAM Discussions.

#### **3.3.2 IBR Team-Only**

The team may also want to conduct an IBR Team meeting before the CAM discussions begin. This meeting is the final opportunity to focus the IBR Team on the objectives and their participation expectations.

#### **3.3.3 CAM Discussions**

The CAM Discussions are the key events of the IBR. These discussions focus on key risk areas and management processes. During this period, the team members should cover the key aspects of the planning of the work scope. Overall success of the IBR results, in part, through productive CAM discussions. Following the techniques and formats below will help to ensure that adequate information is obtained in a timely manner to accomplish the objectives of the IBR.

### 3.3.4 CAM Discussion Guidelines

Below is a list of suggested techniques for all team members to consider before and during the CAM Discussions.

- Have an objective. What do you expect to gain from the discussion?
- What questions will you ask to achieve the objective?
- Prepare a tentative list of basic questions to serve as a framework for the discussion. This will open the way for spontaneous in-depth conversation and follow-up questions. See [Appendix E](#) for sample IBR questions.
- Designate a person (scribe) to take notes. You should also take notes when not speaking and compare during the team caucus.
- Prior to the CAM discussions, the IBR Team members should be familiar with areas previously identified for discussion. Review the documentation thoroughly and formulate your own questions based on the data analysis.
- Prior to the discussion, conduct a basic data and documentation trace to become comfortable with the data and how it flows through the system.
- Introduce yourself and identify the organization you represent. You may also wish to indicate your team affiliation in the review.
- Be well prepared and maintain a tempo that keeps the discussion moving along toward satisfying your objective. Be friendly, but avoid long conversations extraneous to the discussion.
- Request copies of documents only if necessary to accomplish the objective of the discussion. If documentation is not readily available, complete a Documentation Request Form and submit it to the IBR Coordinator.
- Watch the time. Discussions are normally scheduled for two hours in length. Should additional time be required to complete the discussion, coordinate with the Team Leader and IBR Coordinator?
- If disagreements arise which cannot be resolved, the team member should write a description of the disagreement in a Finding and submit it to the Team Leader for disposition. The Team Leader will handle any continuing discussion.
- The supplier must ensure that each CAM is trained and well prepared (documentation available, understands documentation content, can support answers, etc.).
- Phrase questions that will require a detailed response. Avoid questions that may lead to a Yes/No response.
- Ensure CAM (not the support team) answers the questions. The CAM's support team may provide additional/supporting detail when requested by the discussion lead. If the CAM's answer is ill-defined or unclear, continue to probe with additional questions.
- Use "Show me" statements versus "tell me" statements. Have the CAM show answers in their files they display via network files structure or the eCAM Notebook.
- At the end of the discussion express thanks to the CAM and their team, and dismiss them so the team can caucus and summarize the discussion recapping follow-up action items and potential Finding(s).

### 3.3.5 IBR Documentation and Forms

After each CAM discussion, each Sub-team should sit down and review what was discussed. This is an opportune time to collect documentation to better prepare for the out-brief presentation. Each Sub-team Leader is responsible for documenting the team's Findings/Action Items. The Team Leader uses the documentation to support overall team assessments and required corrective actions.

The following forms have been developed to facilitate review documentation. Samples of these IBR forms are provided in the Appendices. Note that these are sample formats and program/project specific formats can be substituted.

**Discussion Assessment Form:** The Sub-team should complete one of these forms after each discussion. The Sub-team Technical Leader is responsible for reviewing this form and submitting it to the Team Leader and the IBR Coordinator. Keep in mind that the Discussion Assessment Form can be tailored based on risk. See [Appendix F](#) for a sample of this form.

**Findings/Action Items:** A Finding is a significant deficiency or discrepancy that warrants documentation and disposition (e.g., of inadequate amount of resources significantly reduces the contractor's ability to meet delivery date) and should be logged and categorized by the risk areas and/or a general finding. See [Appendix I](#) for sample logs. Findings should be submitted immediately to the Team Leader, and as soon as practical to the supplier. A supplier response or plan should be provided to the IBR Team as soon as possible, and then worked until closure. However, in the event that a resolution or disposition cannot be reached, is disagreed with, or is refused, then an alternative should be presented and agreed upon by all parties. Ultimately, the Program Office/Mission Directorate will make the final decision. Action Items are typically minor, can be fixed quickly and are not as serious as findings. Examples of action items include IMS with incomplete coding of control accounts, work packages, etc.; examples of findings include schedule data not correlating or supporting cost data, unsupportable EAC, lack of ETCs, etc. Action Items can also be tracked along with findings in the Findings/Action Items log as noted in [Appendix I](#).

**Documentation Request Form:** During CAM discussions, the team may find that additional documentation is required to gain a better understanding of the issue in question. Use this form to obtain required documentation. Submit the completed form to the Team Leader and the IBR Coordinator. All forms will be tracked to reduce redundancies and to ensure receipt of all the requested material. See [Appendix G](#) for a sample of this form.

**Risk Assessment:** A risk assessment should be completed after each discussion. Each risk and opportunity identified during the CAM discussion is assigned a probability of occurrence. A potential cost and schedule impact for each risk and opportunity should be estimated, and a determination made as to whether this risk has been accounted for in the baseline. Each risk is classified as cost, schedule, technical, resource, or management process and assigned a rating based on risk evaluation criteria established by the Team Leader prior to the IBR. The ultimate goal of the risk assessment area of the IBR is an updated EAC or Life Cycle Cost Estimate (LCCE), which incorporates quantified risks. See [Appendix H](#) for risk evaluation criteria. This is the only time color coding should be used in the IBR. IBR are not a pass/fail event and rating the overall IBR or CAM discussions is not appropriate.

All forms should be compiled and logged in an IBR Log. The IBR log should consist of both potential and actual issues revealed prior to and during the review, and should contain the appropriate actions required along with anticipated completion dates. This IBR Log will support the Letter of Findings during the IBR Close-Out Phase. See [Appendix I](#) for a sample of logs.

## **3.4 Out-Briefs**

### **3.4.1 Daily Status**

At the end of each day, the NASA IBR Team should conduct a team caucus where each team reports Findings/Action Items from the CAM discussions. This will ensure that the entire IBR team is aware of issues that have been raised by other teams, allowing further investigation during other CAM discussions. It is at the discretion of the Team Leader if supplier representative(s) were a part of this meeting to help clarify any issues and/or address any needs. Ensure adequate time is allotted at the end of each day.

### **3.4.2 Out-Brief**

The IBR Team is part of the development of the final out-brief where the team can discuss the Findings/Action Items prior to briefing the supplier. This will ensure that the IBR Team members have a clear understanding of any Findings/Action Items. The agenda for the IBR must ensure that ample time is made available to prepare and present the out-brief presentation. Typically 2 to 3 hours for discussion and development is sufficient, and about 30 minutes to an hour for the out-brief.

The Team Leader should out-brief the supplier at the end of the on-site IBR. The out-brief should be tailored for each contract or in-house work activity. However, several areas should be included: (1) the brief should include assessments of each control account discussed (pros and cons), as well as all Findings and Action Items, (2) a summary of the overall risk by areas, (3) the Team Leader should provide an overall evaluation (not a color coding or rating) of the IBR and assess whether or not a follow-on review will be required. This decision is based on the Team Leader's assessment of whether the objectives of the IBR have been achieved. This is not the time for the supplier to resolve the Findings, but rather to acknowledge the Findings and come back with a response/plan to resolve them.

The Team Leader may also want to have the Technical Leads brief their area(s) of expertise. In addition, the Review Facilitator should note to the team any concerns and issues related to the management processes.

## **4.0 IBR CLOSE-OUT**

### **4.1 General**

Once the IBR out-brief is completed, the closeout portion of the IBR process entails the review of all corrective actions (i.e., Findings and Action Items) identified during the IBR and the establishment of a plan to formally close out the IBR. The customer and supplier should agree on the closure plan of action and identify individuals responsible for all identified risks, Findings, etc. This phase also includes capturing lessons learned from the IBR process. The purpose of closure plan is not to resolve the items, but rather the plan to resolve them. The supplier should submit the closure plan in a timely manner as directed by the Team Leader during the IBR out-brief.

### **4.2 Reporting IBR Results**

The results of the IBR should be reported to the supplier, and an IBR Report or a Letter of Findings can be used to effectively communicate these results. For contractors, the IBR is an event required by the contract, therefore a letter issued by the COR is customarily sent. The Review Facilitator should work with the Team Leader to generate the letter to the supplier. A letter will help to prevent the supplier from claiming that resolving actions resulting from the IBR are out of scope.

The purpose of the letter or report is to summarize all of the findings documented during the IBR discussions and to request a corrective action plan from the supplier. The corrective action plan should identify proposed corrective/preventative actions, responsibility assignments, and projected completion dates. Issues that could impact the performance measurement data should also be identified and a copy provided to the appropriate EVMFP member. [Appendix J](#) contains a template for a Letter of Findings and [Appendix K](#) contains an IBR Report template. The IBR Findings/Action Items spreadsheet would typically be acceptable attachments to the letter. Also, if an IBR report is prepared, it should be included as part of the letter to the supplier.

As an alternative, the customer and the supplier could agree on a corrective action plan immediately after the IBR out-brief to ensure more timely resolution of issues. This will make certain that the findings are understood and that the IBR team agrees with the corresponding corrective action plan. This can speed resolution of the findings and closeout of the IBR.

### **4.3 Tracking Findings**

Tracking the progress in resolving each finding rests with the Team Leader, including the DCMA team representatives located at the contractor's facility, where applicable. The IBR Coordinator should work closely with the IBR Team to ensure that all actions are closed. Regular project reviews are also another good place to have the follow-up on any actions that resulted from the review. Approval of corrective actions rests with the Team Leader, and most likely will be an iterative process.



## 4.4 IBR Close-out Letter

The Team Leader will approve the close out of the IBR. An IBR closeout letter is sent to the supplier indicating that all findings are either closed or being tracked and that the IBR is complete. Reporting the results of the IBR may take the form of an informal letter or memo for record, depending on the size and formality of the IBR. See [Appendix L](#) for a sample IBR Close-out Letter.

## 4.5 Lessons Learned

After the IBR on-site or virtual review and actions have been agreed upon, it is important that the IBR Facilitator polls the IBR participants for lessons learned. This includes the areas that worked well and those where improvements could be made. Lessons learned can come from both the IBR team and the supplier team.

Lessons learned should be forwarded to the NASA EVM Program Executive and organizational EVM Focal Point members. In addition, a final IBR Findings log will be forwarded as for inclusion in the Agency's IBR Findings database. For more information, please contact your local EVMFP, EVM PE, or EVM DPE. This handbook was developed using other government agencies, industry, and best practices from previous NASA IBRs, and are included herein:

- Follow NFS IBR requirements for contracts and NASA requirements for in-house efforts. Ensure all sub-contractor IBRs have been conducted (identification of deficiencies with PMB) prior to the prime IBR, then project level, and finally program level.
- At the discretion of the Team Leader, include the supplier in IBR training and pre-meetings. Joint IBR training allows for joint preparation in the achieving the IBR goals and clear expectations
- Ensure a CAM discussion strategy which will be used to conduct the review is identified and agreed to by team members prior to the review meetings (i.e., who will ask questions, who will take notes, etc.). This will ensure that team members understand roles and responsibilities during the CAM discussions.
- Ensure CAM discussions focus on 85% of the total budget including the high dollar and high-risk control accounts, unless all control accounts will be reviewed. If time allows, review one LOE and one material control account.
- Ensure the IBR Team does their homework and has reviewed data specific to their areas prior to the on-site IBR. More structured questions will help to satisfy their understanding of the data, and may also highlight issues before the on-site IBR. This will help ensure the on-site IBR goes smoothly.
- At the discretion of the Team Leader, supplier participation in the daily out-briefs can help to ensure that findings are clearly communicated and understood. However, it is important to stress that the purpose of the meeting is for team discussion of issues and not for resolution of those issues. If time permits and doesn't disrupt the review schedule, it is permissible to try and resolve issues. Otherwise, it is suggested to discuss after the review. It is also recommended that the IBR Team caucus first in case they need to say things without the supplier in the room, and then invite them in.
- Ensure there is adequate time for the CAM discussions and IBR Team caucus afterwards. CAM discussions should not be scheduled for less than two hours to ensure that teams have

enough information to answer questions and discuss Findings/Action Items. Ample time must also be allowed to caucus with team members. If the time allotted for CAM discussions is insufficient, work with the CAM to schedule additional time. This will eliminate the need for side-bar discussions, ensuring that the whole team is aware of the information. This of course depends on the control account(s) to be reviewed during a CAM discussion. If a CAM has multiple control accounts they could be longer. Typically, 15 - 30 minutes is sufficient for IBR Team to caucus and compare notes prior to going to the next CAM Discussion.

- Reconfirm CAM availability prior to the IBR in case any adjustments need to be made, or arrangements to hold a special CAM discussion at an alternate time if deemed vital to completing the IBR. The supplier should not notify the IBR Team at the last minute that a major CAM is unavailable, and offer a substitute control account that is not of equal importance.
- Limit the amount of CAM discussion attendance (e.g., 20-30 attendees). Experience has shown that CAMs are reluctant to share the real story of their control account(s) with many people in the room. Recommendation is to always hold a small group.
- Ensure that all data has a consistent data date or status date (IPMR, IMS, etc.).
- Ensure clear expectations with customers/suppliers on what data will be required up-front, roles and responsibilities, how the on-site IBR will be conducted, and what is expected after the review.
- Ensure data is submitted prior to the IBR with adequate time for review and analysis. Three to four weeks is ideal, but no less than two weeks. The more time for the pre-review, the more thorough the analysis and time to resolve issues before they become a finding at the on-site IBR.
- Ensure all logistics are taken care of (i.e., directions to include buildings/rooms), security access to facility, avoid escort-required security arrangements, conference and other rooms coordinated.
- Conference rooms have sufficient seating/tables, outlets/power strips, projector, internet access, room temperature, dedicated room for IBR Team, etc.). Conference rooms should be tested prior to CAM discussions. Wi-Fi instructions need to be provided and an IT rep available to support IBR Team members accessing Wi-Fi in a timely manner.
- Ensure the length of the IBR is not dictated by another review or the supplier (i.e., 1 day IBR at the end of another meeting at a contractor facility). The duration of the IBR depends on the dollarized RAM, time needed to review 85% of the total budget and how many parallel teams are available to conduct CAM discussions. Any deviation from the 85% of the total budget (control accounts) needs to be agreed upon by the Project Manager and the NASA EVM Program Executive.
- Ensure CAMs answer questions for the most part, instead of their support personnel. Support personnel may assist, but CAMs need to understand data and be able to navigate the data traces.
- Ensure CAM discussions are “show me” versus “tell me”.
- Avoid distractions (cell phones, other conversations, conference rooms not reserved for the whole time, etc.).
- The IBR Out-brief should consist of a reiteration of the intent of the IBR, list of findings (not a time solve or have lengthy discussions), supplier accolades (what went well, strengths), and a plan for the supplier to respond to the findings

- Ensure the overall IBR, CAMs, etc. are not graded (or color coded) due to the IBR not being a pass/fail event and the subjectivity of grading an IBR. However, the five risk areas have objective evaluation criteria (colored coded). These are the only color coding ratings appropriate.
- Conduct a mock CAM discussion prior to on-site review if time permits.

Usable copies of most appendices are available at [Earned Value Management \(EVM\) | NASA](#).  
**APPENDIX A: IBR Notification Letter Template**

To: <Supplier Contract Officer Name/Supplier Program or Project Manager Name,  
Company/Organization>

SUBJECT: Notification of Integrated Baseline Review (IBR) and Request for Documentation for  
<Project Name or Contract #>.

It is the intent of the <Customer Project Name> Project Office and the <Organization or Contractor> to use earned value as a tool in the management of <Project Name or Contract #>. In order to support this effort, a joint IBR will be conducted in accordance with this contract and current NASA requirements on <Date of On-Site Review>. Detailed scope of the IBR, including specific control accounts, will be determined at a later date.

The purpose of the review is to achieve a mutual understanding of the Performance Measurement Baseline (PMB) and its relationship to the Earned Value Management System (EVMS) and management processes. The objectives are to gain insight into cost and schedule risk associated with the contracted effort and to establish confidence in the project's baseline plans. This will be accomplished by jointly evaluating, through discussions with your Control Account Managers (CAMs), the PMB to ensure it captures the entire technical scope, is consistent with contract schedule requirements and has an adequate resource plan. Discussions will focus on the scope of work, work authorization, scheduling, resource allocation and time phasing, Performance Measurement Techniques (PMTs), among other items used to manage the work.

Enclosed is a list of documentation requirements that need to be submitted electronically in their native file format for government review no later than <Date>. Forward all electronic submissions to the IBR Coordinator: <IBR Coordinator Name, Email>. The IBR team requires non-escort badges, team work area/conference room, and access to printers, projectors, internet, and telephones.

The IBR kick-off meeting is scheduled for <Date>. Meeting details will be sent separately. The IBR joint team training is scheduled for <Date>, <Supplier Name> personnel supporting or participating in the IBR are invited. The location is to be determined and will be provided prior to training.

Questions concerning this notification or the IBR may be directed to the PM/IBR Team Lead: <PM/IBR Team Lead Name, Phone, Email> and Government COR: <Name, Phone, Email>.

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<PM Name>  
Project Manager  
<Project Name> Project

Attachment 1: Documentation and Data Request  
Cc: Government COR <Name>, IBR Team Lead <Names>, IBR Team Members <Names>

## Attachment 1: Documentation and Data Request

#	Artifact	DRD	Due Date	Special Instructions
1	Earned Value System Description	X		
2	Work Breakdown Structure (WBS) and Dictionary	X		Only if changed since formal submittal. Must meet content requirements identified within the DRD. SOW Para Identification
3	Organizational Breakdown Structure (OBS)			At Control Account (CA) level
4	Responsibility Assignment Matrix (RAM)			*Excel compatible format
5	Time-Phased Control Account Plan (CAP)			To include: Element of Cost (EOC), Work Packages(WP)/Planning Packages (PP), Performance Measurement Technique (PMT), Period of Performance Dates, specific resources assigned to each. Native file format required, (preferred format Excel)
6	CA/WP Summary			Contains: a. Number of Work Packages by PMT b. Longest CA, Shortest CA, mean and median duration, total value of account. c. Largest CA, smallest CA, mean and median values d. Percentage of discrete vs. Level of Effort (LOE) for entire project. * Excel compatible format
7	Basis of Estimates (BOE)			Include assumptions and Risk at CA level
8	Material High/Low Dollar Threshold Breakdown			
9	Critical Materials List			
10	Contractor/Subcontractor Listing			Include type, supplier, contract value, flow down requirements
11	Risk list from Risk Management System			Include all, with mitigation plans
12	Latest Estimate at Completion (EAC)			Include Supporting Documentation
13	Work Authorization Documents (WADS)			At CA level
14	IPMR	X		Only if changed since formal submittal.
15	Integrated Master Schedule	X		Include: Master, intermediate and detailed, with critical path(s) identified. Include schedule margin Provide Data Dictionary of custom fields *Native File format
16	Schedule Risk Assessment Results			
17	EVM Software Tools			Monthly metric analysis
18	NASA Form 533 M/Q	X		Only if Changed since formal submittal.
19	Budget Logs			Include: Management Reserve (MR), Undistributed Budget (UB), Contract Budget Base (CBB)/Project Budget Base (PBB), Estimated Actuals, Baseline Change Requests (BCRs)
20	Project Plan			If available

## APPENDIX B: IBR Checklist

### IBR Checklist

Phase 1- Organizing & Planning				
Checklist Items	Target Date	Done	Responsibility	Comments
Determine Need for IBR			Team Lead	
Appoint IBR Coordinator and Facilitator			Team Lead	
Request dollarized RAM from Supplier			Team Lead	
Determine CAs to be reviewed			Team Lead	
Identify and assign IBR team members			Team Lead	
Coordinate IBR dates and review agenda with supplier			Coordinator	
Formally notify supplier of IBR and request project data			COR or Coordinator	
Distribute project data to IBR team			Coordinator	
Determine supplier IBR readiness			Team Lead	
Define risk evaluation criteria			Team Lead	
Prepare IBR Team Handbook (electronic or hardcopy)			Coordinator	
Phase 2- Prepare & Train for the IBR				
Checklist Items	Target Date	Done	Responsibility	Comments
Conduct IBR Kick-Off			Team Lead	
Provide EVM Overview/IBR training for team			Facilitator	
Coordinate logistics with team/supplier			Coordinator	
Finalize IBR agenda			Team Lead	
Collect concerns/questions and forward to supplier			Coordinator	
Determine CAM discussion questions			Sub-team Leads	
Phase 3- On-site IBR Activities				
Checklist Items	Target Date	Done	Responsibility	Comments
Present IBR In-brief			Team Lead	
Conduct CAM and other discussions			Sub-team Leads	
Hold daily team caucus to discuss issues/findings, etc			Team Lead	
Request additional data, as required			Coordinator	
Complete Discussion Assessment Form			Sub-team Leads	
Document Findings			Sub-team Leads	
Document Action Items			Team Lead	
Prepare/conduct IBR Out-brief			Team Lead	
Phase 4- Follow-up Activities				
Checklist Items	Target Date	Done	Responsibility	Comments
Formally notify supplier of IBR Findings			COR	
Document lessons learned			Team Lead	
Monitor Findings and Action Items progress			Team Lead	
Notify supplier of IBR closure			COR	
Submit IBR log to EVMPE			Team Lead	

## APPENDIX C: Dollarized Responsibility Assignment Matrix (RAM)

<b>FLIGHT DEVELOPMENT PROJECT</b>				<b>CAM</b>	<b>BAC (\$K)</b>
<b>1</b>	<b>Flight Development Project</b>				<b>72300</b>
<b>1.1</b>	<b>Project Management</b>			CAM 1	<b>5000</b>
1.1.1					
1.1.2					
<b>1.2</b>	<b>Systems Engineering</b>			CAM 2	<b>3000</b>
1.2.1					
1.2.2					
<b>1.3</b>	<b>Science/Technology</b>			CAM 3	<b>2000</b>
1.3.1					
1.3.2					
<b>1.4</b>	<b>Safety and Mission Assurance</b>			CAM 4	<b>500</b>
1.4.1					
1.4.2					
<b>1.5</b>	<b>Payload (s)</b>				<b>5000</b>
1.5.1				CAM 5	1000
1.5.2				CAM 6	4000
<b>1.6</b>	<b>Aeronautical and Spacecraft Systems</b>				<b>12000</b>
1.6.1				CAM 7	2000
1.6.2				CAM 8	4000
1.6.3				CAM 9	6000
<b>1.7</b>	<b>Ground System(s)</b>				<b>18000</b>
1.7.1				CAM 10	2000
1.7.2				CAM 11	5000
1.7.3				CAM 12	3000
1.7.4				CAM 13	8000
<b>1.8</b>	<b>System Integration and Testing</b>				<b>5000</b>
1.8.1				CAM 14	2000
1.8.2				CAM 15	3000
<b>1.9</b>	<b>Launch Vehicle/Services</b>				<b>12000</b>
1.9.1				CAM 16	4000
1.9.2				CAM 17	3000
1.9.3				CAM 18	5000
<b>1.10</b>	<b>Mission Operations</b>				<b>9000</b>
1.10.1				CAM 19	2000
1.10.2				CAM 20	7000
<b>1.11</b>	<b>Education and Public Outreach</b>			CAM 21	<b>800</b>

## APPENDIX D: Agenda Example

Date:

Time		BLDG/ROOM	ACTIVITIES	RESPONSIBILITY
7:30 AM	8:00 AM		Assembly	All
8:00 AM	9:30 AM		IBR In brief, Administrative Details, Project/EVM/Business Rhythm Overview	Gov. PM, Contractor PM, Others
9:30 AM	11:30 AM		CAM Discussion 1: <WBS>, <CAM Name>	IBR Team A
11:30 AM	12:00 PM		CAM Discussion 1: Caucus	Team A Reviewers, PM, Gov
9:30 AM	11:30 AM		CAM Discussion 2: <WBS>, <CAM Name>	IBR Team B
11:30 AM	12:00 PM		CAM Discussion 2: Caucus	Team B Reviewers, PM, Gov
12:00 PM	1:00 PM		Lunch	All
1:00 PM	3:00 PM		CAM Discussion 3: <WBS>, <CAM Name>	IBR Team A
3:00 PM	3:30 PM		CAM Discussion 3: Caucus	Team A Reviewers, PM, Gov
1:00 PM	3:00 PM		CAM Discussion 4: <WBS>, <CAM Name>	IBR Team B
3:00 PM	3:30 PM		CAM Discussion 4: Caucus	Team B Reviewers, PM, Gov
3:30 PM	4:00 PM		Day 1 Caucus	ALL

Date:

Time		BLDG/ROOM	ACTIVITIES	RESPONSIBILITY
8:00 AM	8:30 AM		Assembly	All
8:30 AM	10:30 AM		CAM Discussion 5: <WBS>, <CAM Name>	IBR Team A
10:30 AM	11:00 AM		CAM Discussion 5: Caucus	Team A Reviewers, PM, Gov
8:30 AM	10:30 AM		CAM Discussion 6: <WBS>, <CAM Name>	IBR Team B
10:30 AM	11:00 AM		CAM Discussion 6: Caucus	Team B Reviewers, PM, Gov
11:00 AM	12:00 PM		Lunch	All
12:00 PM	2:00 PM		CAM Discussion 7: <WBS>, <CAM Name>	IBR Team A
2:00 PM	2:30 PM		CAM Discussion 7: Caucus	Team A Reviewers, PM, Gov
12:00 PM	2:00 PM		CAM Discussion 8: <WBS>, <CAM Name>	IBR Team B
2:00 PM	2:30 PM		CAM Discussion 8: Caucus	Team B Reviewers, PM, Gov
2:30 PM	4:30 PM		CAM Discussion 9: <WBS>, <CAM Name>	IBR Team A
4:30 PM	5:00 PM		CAM Discussion 9: Caucus	Team A Reviewers, PM, Gov
2:30 PM	4:30 PM		CAM Discussion 10: <WBS>, <CAM Name>	IBR Team B
4:30 PM	5:00 PM		CAM Discussion 10: Caucus	Team B Reviewers, PM, Gov
5:00 PM	5:30 PM		Day 2 Caucus	Gov. PM, IBR Teams

Date:

Time		BLDG/ROOM	ACTIVITIES	RESPONSIBILITY
9:00 AM	11:00 AM		IBR Out-Brief Preparation	Gov. PM, IBR Teams
11:00 AM	11:15 AM		Assembly	All
11:15 AM	11:45 AM		IBR Out-Brief & Closing Statements	Gov. PM



## APPENDIX E: Sample IBR Questions

The list of sample questions below should serve as a guide. It is not intended for the IBR Team to ask all of these questions during the CAM discussions, but rather to assist with the thought process on how to structure specific questioning. The questions are in a logical order as to how the line of questioning could be conducted from planning to analysis. The IBR Team should select the ones they wish to ask, however, the majority of the IBR Team questions should come from the results of their data review prior to the IBR meetings.

1	Can you provide an OBS Dictionary or Chart?
2	Can you provide a RBS (Resource Breakdown Structure) Dictionary or Chart?
3	What is your scope? (The CAM should be able to refer to a SOW paragraph, a Work Breakdown Structure (WBS), or WBS narrative, WBS Dictionary and a WAD.)
4	What are your schedule responsibilities?
5	How did you plan the work into control accounts? (The SOW/Project Plan defines the effort. The WBS or CWBS provides specifics, such as work definition. The work authorization and change documentation should show information such as the dollars/hours, period of performance, and description of the scope of work and any changes.)
6	How did you ensure that all elements of the scope are planned? (The CAM should be able to show the scope of work broken down into work packages, planning packages, or summary level planning packages and the budgets and ETCs associated with each. The sum of the work packages and planning packages should equal the control account budget. The actual costs plus the ETCs should equal the EAC.)
7	Show me your work authorization document(s) which define the work you must accomplish and relate these requirements to the work remaining within your team/WBS element at the time the cost to complete, was analyzed/developed.
8	Reconcile the complete WBS to the schedule. (This should be done prior to on-site review)
9	Specifically, what technical items are currently producing the greatest risk to achieving technical, schedule or cost goals? Are these items reviewed as part of a risk assessment, management plan or other reporting tool to your project management office?
10	What role did you play in formulating the budget?
11	How did you arrive at your budget figures? Do you have the backup or worksheets from which you arrived at your estimates?
12	Was there a negotiation process for your budgets? Is your budget adequate?
13	What is your total budget? (For each subcontract and the corresponding control accounts). How is profit or fee included in your budget?
14	What criteria determine whether a subcontract or a purchase order is used? What types of subcontracts exist or plan to be negotiated? (fixed price vs. cost plus).
15	How many control accounts are you responsible for and what is the total dollar value of your accounts? Show me a control account plan?
16	How are your budgets time-phased, and is this reflected in your control account plan?
17	Does it reflect an achievable value for the resources to fully accomplish the control account scope of effort?
18	How many people work for you and what do they do?
19	How do they report to you? How do you know the performance status of their work?

20	How did you obtain the resources for assigned work? (Baseline resources should be identified in the WAD and changes in scope, cost or schedule requirements should be reflected in change request documentation.)
21	What process did you use to develop the resources required to accomplish the current plan and how does this differ from the original plan?
22	Have you adequately planned and time-phased resources to meet the plan? Is the schedule resource loaded? If so, to what level of detail? If not, how are resources managed?
23	To the level of detail your schedule is resource loaded, how do you reconcile changes to resource allocation?
24	Has the schedule been resource leveled?
25	Are the maximum units per resource accurately identified?
26	What comparison has been done between the resources required as tasks are currently scheduled and the resources available during the same time frames?
27	If there are tasks in the schedule that do not have resources assigned, how are you addressing this in your EVMS?
28	Are the time phased budget resources consistent with your integrated master schedule? (Show the trace from your control account to intermediate or master schedules.)
29	Is all your scope of work detail planned?
30	What rationale was used to time phase the budget into planning packages, tasks, work packages or summary activities?
31	What is the procedure and time frame for developing work packages from the planning packages?
32	Are your planning packages time-phased?
33	Do you have any LOE accounts? Describe the tasks of these accounts.
34	Do you have any control accounts that contain a mixture of LOE and discrete effort? What is the highest percentage of LOE within an account that also contains discrete effort?
35	What percent of your work is measured or discrete effort? What percent is LOE?
36	Is the time-phased budget related to planned activities of the work package?
37	Who prepares the budgets for your work packages?
38	Does anyone review labor hours charged to your work packages?
39	Do you ever have mischarges to your work packages? How are these corrected?
40	Have you had retroactive changes and/or re-planning efforts to the budget baseline?
41	[Choose a Control Account, for the example control account]: What is your total budget amount? Of this total budget amount, how much is distributed to work packages and how much is retained in planning packages? Do you have an undistributed budget or management reserve account?
42	How was the budget time-phased for each work package? (i.e., what was the basis for the spread?)
43	How are material budgets planned? How do you track material prior to delivery? How do you track material when deliveries are late?
44	How are you authorized to begin work? (Provide an example of work authorization documentation.)
45	Have you ever opened work packages earlier than the scheduled start date? If so, how is this accomplished?

46	What document authorizes you to begin work on a subcontract?
47	How do you open a control account?
48	How do you close a control account?
49	How can you tell when a control account is opened or closed?
50	How were/are you advised of budget, tasks, and schedule changes?
51	How do you status your accounts? How does the performance status of your accounts get into the system?
52	Have you had any changes to your accounts? (Provide an example of how these are handled.)
53	Are budget transfers between your accounts and management reserve and undistributed budget traceable? How?
54	Do you have any work originally planned for in-house that was off-loaded subcontracted out? How was this accomplished? (Make vs. Buy)
55	For off-loaded work that has been contracted out, was the budget transferred directly, returned to management reserve, or to undistributed budget?
56	Determine how changes are incorporated. Evaluate the effect of changes on performance measurement information. Assess whether changes are done in accordance with the EVM system description or documented management processes.
57	Has your effort been impacted by any directed or contractual change?
58	When did you receive authorization to proceed with the change and how did you incorporate the change in your plan (schedule and budget time phasing)?
59	What documents are involved in a change to a control account's scope of work, schedule, budget, or ETC? [Ask CAM to provide an example]
60	Did you re-phase or re-plan work? In process work? Completed work? Unopened work packages? Make current period or retroactive changes? If so, how was this accomplished?
61	Did you transfer budget between control accounts?
62	How have contract changes or other changes been incorporated into the control account?
63	If one of the control accounts had an unfavorable cost or schedule variance did you re-plan or request management reserve to reduce or eliminate the variance?
64	What formal training have you had in EVM?
65	Do you feel you have had adequate training or do you need more?
66	What type(s) of PMT (Performance Measurement Techniques or EVT) indicators have been assigned by you?
67	Is the PMT chosen appropriate for the type of work being performed?
68	If the Percent Complete PMT is used, show us how you take status. (Quantifiable Back-up Data (QBDs) to support that percentage).
69	Does the earned value assessment correlate with technical achievement?
70	Do you use interim milestones on any of your work packages to measure Budgeted Cost for Work Performed (BCWP)?
71	What options does your management system provide for taking BCWP? Do your control account plans indicate the method used in taking BCWP?
72	Demonstrate how you earn BCWP in the same way that Budgeted Cost for Work Scheduled (BCWS) was planned?
73	Can you provide examples of how you measure BCWP or earned value for work-in-

	process?
74	Is progress toward accomplishing identified and planned activities used to determine earned value? If yes, describe the process. If no, how is earned value assessed?
75	What methods and tools does the CAM use in administering the plan? (Some examples are weekly or monthly earned value reports; master, intermediate, and detail schedules; periodic meetings; independent assessments of technical progress, etc.)
76	What reports do you receive that give you cost and schedule progress of your control accounts?
77	Are you responsible for any subcontracts? If so, what are they? How do you monitor performance on these? How do you take BCWP?
78	How are subcontracts managed? (Ask the Subcontracts Manager to describe the process for managing subcontractor earned value.)
79	What subcontractor technical, schedule and cost reports are required to be submitted to you or your team?
80	How do you check the status and performance of work on your control account by a subcontractor? How are actual costs recorded against your control account?
81	Who specifically needs the subcontractor outputs or products to perform their program functions? How do you status others on the progress of your outputs to them?
82	What is specifically needed by you from other CAMs to generate subcontractor outputs or products? How do you monitor its progress?
83	When is BCWP taken on material? How much BCWP is earned when material is withdrawn from inventory or received?
84	Will an account accept BCWP or Actual Cost of Work Performed (ACWP) if there is no BCWS?
85	Identify risks/opportunities that are included/not included in the baseline.
86	What are the major risks or challenges remaining to accomplish the CAM's or subcontractor's responsibilities?
87	Ask the CAM to describe why it is a risk or opportunity.
88	Exchange ideas about risks or opportunities.
89	Establish the likelihood of the risk/opportunity event.
90	Ask the CAM to explain the risk mitigation plan emphasizing risk mitigation milestones and associated risk performance measurement.
91	Determine the impact (cost/schedule) for medium and high risks.
92	Ask the CAM to consider extreme values for the effort (optimistic/pessimistic).
93	Document results of the Risk Assessment Form.
94	What are the major challenges or risks to the subcontractor in accomplishing project responsibilities? Are these items tracked by the Project Management Office or Functional Manager in a risk register or plan?
95	How and when is risk assessment or risk management plan updated for technical/schedule/cost risk items affecting your control account?
96	How does the EAC compare to the Budget at Completion (BAC)? (Note: The ETC should be reviewed monthly by the CAM.)
97	What is an EAC?
98	Have you updated your EAC?
99	What is your current EAC and how was the EAC developed?

100	How often do you update your EAC?
101	Have you done a Comprehensive EAC? If not, do you know when the next comprehensive EAC will be done? If so, When?
102	What guidance or instructions did you receive from management in order to develop your EAC?
103	If written instructions were provided, what were these and who authored them?
104	Who reviews updates to the EAC?
105	Discuss your management's involvement in developing the estimate of the cost remaining to complete your program tasks.
106	Can you outline the steps you took to arrive at your estimate? [Choose a Control Account to demonstrate/validate CAM understanding and adherence to process]
107	How did you determine the effort or resource amounts required to complete the remaining work?
108	Demonstrate that your EAC is segregated by labor, material, and other direct charge categories.
109	Define the work remaining within your WBS element at the time the cost to complete was analyzed/developed. Identify effort to be performed by major subcontractors.
110	Explain how EAC's are calculated for material?
111	What current and future events and performance factors have been included in your current cost to complete? (Examples: task changes, make-buy decisions, performance factors, etc.)
112	Did you consider the current cost performance trend (TCPI vs CPI)? What performance level was assumed and why?
113	How does the projected performance level compare to your experienced level of performance?
114	Describe and demonstrate how you projected the cost to complete over the time remaining.
115	Does the EAC require program manager approval?
116	Do you believe that the budget or ETC is sufficient to perform the work? (Review the basis of estimate for reasonableness. Ask the CAM to describe the resource requirement development process.)
117	Are variance analysis thresholds or requirements established for reporting technical, schedule or cost variances to planned goals established for your control accounts? Do you informally/formally report the cause of variance, impact or corrective action for these variances?
118	Do you have any variance thresholds on your control accounts? If so, what are they?
119	How do you know when you have exceeded a threshold?
120	How do rate changes affect your control accounts?
121	How do you know when you must prepare a variance report?
122	Do you have samples of any variance analysis reports?
123	How do you determine what is causing the variance? [Cost Variances should be broken down by Element of Cost (Labor, ODC, Sub/Material and Rate vs. Usage)]
124	How do you determine whether the reported cost variance is due to usage or rates? Subcontractor effort or a company overhead rate?
125	Who is responsible for rate variance analysis?
126	Does your variance analysis show a statement of problem, the variance, cause, impact and proposed corrective action?

127	Who receives your variance reports?
128	What action is taken on the reports?
129	Which reports do you use most frequently? Why?
130	Have you ever found errors in the data? How are data anomalies identified and corrected?
131	Provide the methodology that illustrates the schedule development and integration with the EVMS.
132	What sources of data or information are used in the development of your schedule?
133	How did you time-phase the work to achieve the schedule? (All work should be logically planned in compliance with the SOW and schedule.)
134	Is the schedule data grouped and organized logically?
135	How is it determined which activities are tied together with logic?
136	Discuss Schedule interfaces and constraints.
137	How does your work package relate to the CWBS or WBS? Discuss with actual examples.
138	What is the difference between a work package and a planning package?
139	How is the Earned Value Technique determined? Is it easily identified in the schedule?
140	Describe your method of determining task durations.
141	Do you directly support any major master or intermediate schedule milestones? Do you have detailed schedules below the work package? How do detailed schedules below the work package support the work package schedules?
142	Are the OBS, RBS and WBS horizontally (identified) within the schedule?
143	If applicable, how are subcontractor(s) schedules developed and integrated into the master project schedule?
144	Is the status date accurately reflected in your schedule(s)?
145	When was the last official schedule baseline established?
146	How do you know that the work within your control accounts to be performed by subcontractor has been properly planned?
147	Are there additional coding schema not addressed above? If so, describe the nature and intent of these schema.
148	Have you considered risks in developing the plan? Are they incorporated into the schedule? Are they easily identified in the schedule?
149	How and when provide actual and forecast updates to your schedule? Explain how you report schedule status (i.e., percent complete, physical percent complete).
150	Discuss Schedule impacts related to other work/organizations.
151	When are you required to detail plan planning packages or summary activities? What schedule document or system is used to develop detail planning for your control account?
152	Do you have schedule margin? If so, how is it used? Do you use funded schedule margin? Explain the use.
153	How do you know the schedule is structured correctly to report accurate critical paths? Show health check and other metrics.
154	How do you determine your critical path(s)?
155	How do you use the critical path?
156	Provide a critical path analysis for the project.
157	Is the critical path realistic?
158	Does the critical path contain LOE tasks?

159	Has a schedule risk assessment been performed? When was the last assessment performed?
160	How often do you perform a schedule risk assessment and at what level of detail?
161	Who is involved in developing schedule risk assessments?
162	What method(s) are used in developing your schedule risk assessment?
163	How does the current schedule compare with the baseline schedule? (i.e., are you accomplishing work as planned?). Display a schedule work off trend chart.
164	What tasks in your schedule are pacing or being paced? Describe your method of pacing control.
165	Are there external project dependences in the schedule? How are external project dependencies identified and monitored?
166	How are your work package activities related to the IMS or underlying intermediate supporting schedules? Actual examples will support this discussion.
167	How often do you give the update of the schedule to your customer?
168	Discuss the relationships of work packages to milestones.
169	Discuss Resource levels to support schedule milestones.
170	Discuss Relationships to other organizations.
171	What schedule milestones did you use in planning the control account(s)? (Ask the CAM to show the team the schedule milestones used in planning the control accounts.)
172	Select a WP at random. Trace the WP through CA and the schedule. Verify cost and schedule vertical and horizontal integration.
173	Define how data flows from the schedule into the EVMS.
174	Define the EVM indicators used on this project and state their current values (e.g. CV, SV, CPI, and SPI).
175	How is the determination made to add new tasks to the schedule? Who controls this process? How are the resulting date and budget changes managed?
176	Elaborate on your schedule management and change control techniques.
177	Reconcile the EVMS BCWP with the percent complete in the schedule.
178	What is your current schedule variance from the approved baseline?
179	How are updates and changes to the schedule reconciled in the EVMS?
180	How are you informed by other organizations of changes in their output that may affect your control account schedules? (Horizontal Trace)
181	Demonstrate that the progress reflected on the master project schedule or underlying intermediate schedules correlates to the relative progress reflected in the EVMS

## APPENDIX F: Discussion Assessment Form

### IBR Discussion Assessment

LOG#: \_\_\_\_\_

IBR Team: \_\_\_\_\_

Date: \_\_\_\_\_

CAM/Sub-Team Technical Lead: \_\_\_\_\_

WBS/Control Account: \_\_\_\_\_

1. TECHNICAL SCOPE (Statement of Work):

- \_\_\_\_\_ Is there adequate identification, definition, and flow down?
- \_\_\_\_\_ Consistent with contract requirements?
- \_\_\_\_\_ Adequate assignment of responsibility, authority and accountability?

2. SCHEDULE Period of Performance: \_\_\_\_\_

- \_\_\_\_\_ Realistic planned durations?
- \_\_\_\_\_ Logical sequence of work planned?
- \_\_\_\_\_ Consistent with intermediate/master schedule?
- \_\_\_\_\_ Significant interdependencies, interfaces, and constraints?
- \_\_\_\_\_ Support contract milestones?

3. COST

- \_\_\_\_\_ Sound BOE?
- \_\_\_\_\_ Budget reasonableness (time phasing, levels, mix, type)?
- \_\_\_\_\_ Budget adequacy (time phasing, levels, mix, type)?

4. RESOURCE RISK

- \_\_\_\_\_ Resource availability?
- \_\_\_\_\_ Adequate budget, etc. values assigned?
- \_\_\_\_\_ Provisions for scrap, rework, retest or repair, if applicable?

5. MANAGEMENT PROCESS RISK

- \_\_\_\_\_ Integrated cost/schedule/technical planning?
- \_\_\_\_\_ Baseline change control?
- \_\_\_\_\_ Accurate and timely management/performance data?
- \_\_\_\_\_ Adequate determination and maintenance of EACs?
- \_\_\_\_\_ Adequate subcontract management?
- \_\_\_\_\_ Risk management process documents risk associated with the PMB?
- \_\_\_\_\_ Appropriate planned PMTs?
- \_\_\_\_\_ Objective determination of progress?
- \_\_\_\_\_ Methods correlate with technical achievement?

6. Brief Summary of Discussion

7. Finding identified and documented?

8. Document specific risks



## APPENDIX G: Documentation Request Form

### Documentation Request

**Log #:** \_\_\_\_\_

**Submitted by:** \_\_\_\_\_

**Date:** \_\_\_\_\_

1. WBS/Control Account(s):
  
2. Document Description or Type:
  
3. Reason for Request:
  
4. Comments:

## APPENDIX H: Risk Evaluation Criteria

The IBR Out-brief should include the five types of risks for an IBR: Risks can generally be categorized into the following five areas: technical, schedule, cost, resource, and management processes. The following are brief discussions of each of the types of risk.

**Technical Risk** - The ability of the project's technical plan to achieve the objectives of the scope of work. Technical risk includes the effects of available technology, software development capability, design maturity, etc.

**Schedule Risk** - The adequacy of the time allocated for performing the defined tasks to successfully achieve the project schedule objectives. Schedule risk includes the effects on the schedule of the interdependency of scheduled activities to achieve project milestones and support the PM's ability to identify and manage the critical path.

**Cost Risk** - The ability of the PMB to successfully execute the project and attain cost objectives, recognizing the relationship between budget, resources, funding, schedule, and scope of work. The quality of the estimates affects the cost risk, which includes the assumptions used for both estimates and resource allocation on the budgets for work items.

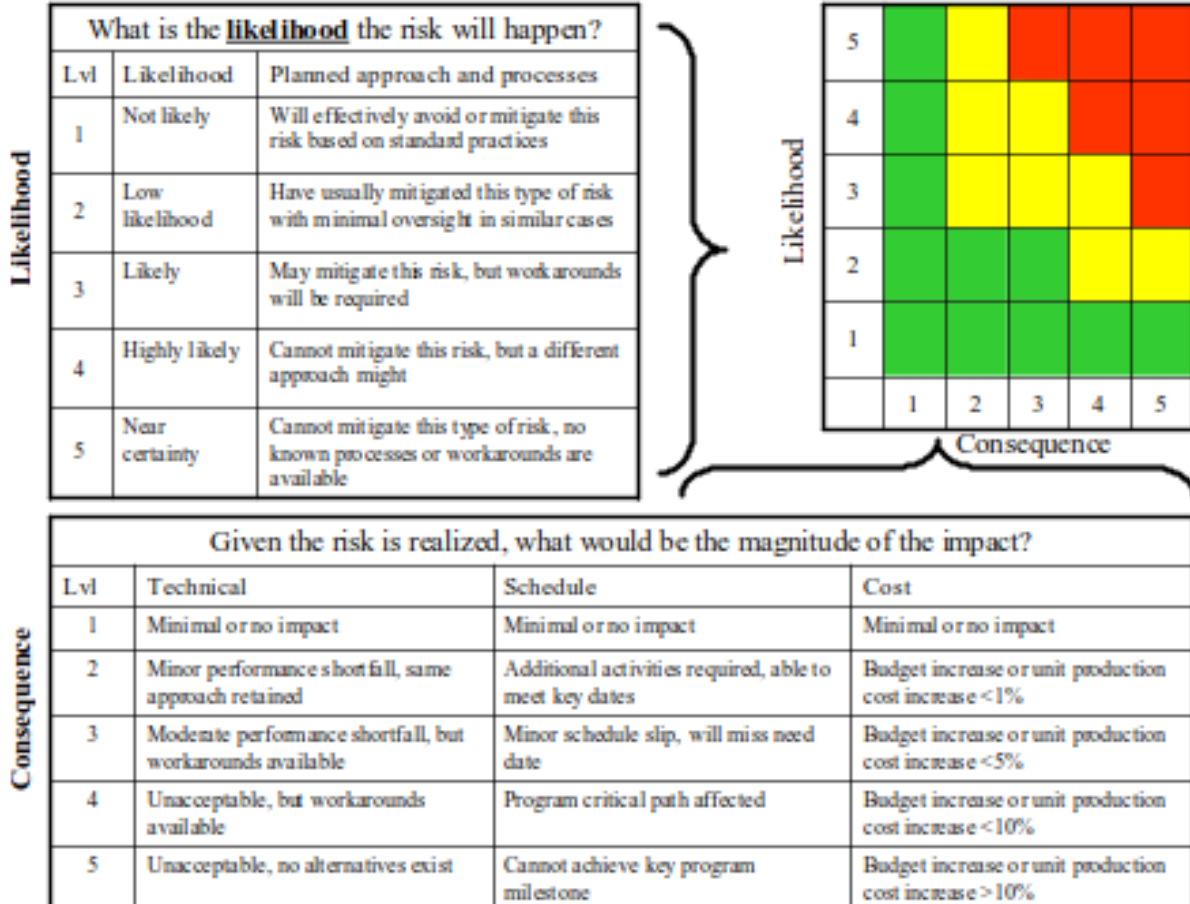
**Resource Risk** - The availability of personnel, facilities, and equipment, when required, to perform the defined tasks needed to execute the program successfully. Resource risk includes the effect of external factors such as loss of availability to competing programs or unexpected downtime that could preclude or otherwise limit the availability of the resources needed to complete planned work.

**Management Processes Risk** - The degree to which the management processes provide effective and integrated technical/schedule/cost planning and baseline change control. The risk associated with the management processes being used includes the ability to establish and maintain valid, accurate, and timely performance data, including data from subcontractors, for early visibility into risks.

The Risk Cube, shown below, is to be used to make a preliminary assessment of new risks identified during IBR. Any new risk will be brought before the Project's Formal Risk Council for review and resolution.

**Technical, Schedule, and Cost Risk – Evaluation Criteria (Example):**

**Project Risk Analysis**



The following paragraphs are a guide that can be used for evaluating the five risk types described above.

**Technical Risk – Evaluation Criteria**

**Low (Green)** – Contractor/In-house Project has developed a comprehensive technical baseline plan which covers all efforts within the SOW/Project Plan, is consistent with contract requirements, and has adequate definition and identification of tasks in the baseline. Work scope responsibility is properly allocated to the performing organization that controls budget and schedule. Technical plan considers the effect of available technology, software development capability, human systems design options, design maturity, rework, etc. Presented plan has identified opportunities to mitigate all medium and high-risk areas. Has little potential to cause disruption of schedule, increase costs, or degradation of performance. Normal contractor/in-house project effort and normal monitoring will probably be able to overcome difficulties.

**Medium (Yellow)** – Technical plan does not cover some effort within the SOW/Project Plan, but is consistent with most contract requirements, and has adequate definition and identification of tasks

in the baseline. Any omitted tasks have no material effect on Key Performance Parameters (KPPs) or (Technical Performance Measurements (TPMs)). All significant work scope responsibility is properly allocated to the performing organization that controls budget and schedule. Technical plan does not fully consider the effects of available technology, software development capability, human systems design options, design maturity, rework, etc. Few identified opportunities are available to mitigate potential risk areas. Special contractor/in-house project emphasis and close monitoring will probably be able to overcome difficulties.

**High (Red)** - Technical plan does not include significant efforts within the SOW/Project Plan, is not consistent with contract requirements, lacks adequate definition and identification of tasks in the baseline, or will not meet KPPs/TPMs as currently planned. Work scope responsibility, in many cases, is not properly allocated to the performing organization which controls budget and schedule. Technical plan does not consider the effects of available technology, software development capability, human systems design options, design maturity, rework, etc. The approach does not identify risk mitigation plans to bring program within acceptable risk and is likely to cause a significant disruption to schedule, increased cost, or degradation of performance. Risk may be unacceptable even with contractor/in-house project emphasis and close monitoring.

### **Schedule Risk**

*Program Critical Path definition:*

The program critical path is the sequence of discrete tasks, WPs, and PPs in the network that has the longest total duration through the entirety of the contract or project. The program critical path, through the schedule integration process, will result in those associated critical path program milestones and key tasks to be represented in addition to the discrete tasks, WPs, and PPs. Once established, the critical path will demonstrate a continuous timeline from project start (or status date) to contract completion date with all time periods being represented, at the minimum, by the lowest level/tier of discrete tasks, WPs, and PPs in which performance will be taken.

***‘Technical Approach’ definition (in relation to critical path):***

The term ‘technical approach’ to critical path refers to the methodology in which the demonstrated critical path was constructed. Proper ‘technical approach’ for a critical path would be represented by:

- Representation of all time periods throughout the path by the lowest level of discrete tasks (i.e., no gaps and the proper level of task is present)
- Proper demonstration within the program critical path of horizontal and vertical integration from discrete tasks, WPs, and PPs up to the highest level/tier IMS schedule (program milestones, key tasks, etc.)
- The text description for each of the discrete tasks, WPs, and PPs on the path represents an appropriate level of visibility into what the task entails
- No evidence of improper use of lead/lag influencing the ability to produce an accurate program critical path
- No evidence of improper use of constraints influencing the ability to produce an accurate program critical path

### **Schedule Risk - Evaluation Criteria**

**Low (Green)** – Low risk in adequacy of time allocated for performing defined tasks to successfully achieve the project schedule objectives. All required contract/in-house project work scope is

represented in the baseline schedule. Proper technical approach is demonstrated in the construction of the program critical path. Virtually all work task plans within planning window are of appropriate (shortest) duration. Virtually all work task plans beyond the planning window are of appropriate duration. Virtually all work task plans demonstrate logical float with minimized values, follow a logical sequence of work, and support intermediate/master schedules and contractual milestones. Use of constraints and lead/lag are minimized in order to assess risk/opportunities to the critical path. Discrete task interdependencies, including major critical subcontract work, clearly identifies the program critical path to completion of contract and are able to demonstrate critical paths to all major program milestones, etc. Normal contractor/in-house project effort and monitoring are expected to resolve documented difficulties.

**Medium (Yellow)** – Medium risk in adequacy of time allocated for performing defined tasks to successfully achieve the project schedule objectives. Most required contract work scope is represented in the baseline schedule. Proper technical approach is demonstrated in the construction of the program critical path. Greater than or equal to 80% of work task plans within the planning window are of short duration. Greater than or equal to 80% of work task plans beyond the planning window are of appropriate duration. Greater than or equal to 80% of work task plans demonstrate logical float with minimized values, follow a logical sequence of work, and support intermediate/master schedules and contractual milestones. Use of constraints and lead/lag is apparent but minimized

in order to assess risk/opportunities to the critical path. The schedule is capable of forecasting downstream impacts to the demonstrated program critical path and/or most of the major critical subcontract work, program milestones, etc. Special contractor emphasis and close customer monitoring are expected to resolve documented difficulties.

**High (Red)** – Inadequate time allocated for performing defined tasks to successfully achieve the project schedule objectives. Much of the required contract work scope is not represented in the baseline schedule. Proper technical approach to critical path is not evident. Less than 80% of tasks are of short duration within the planning window. Less than 80% of work task plans beyond the planning window are of appropriate duration. Less than 80% of work task plans beyond the planning window are of appropriate duration. Less than 80% of work task plans are logically sequenced to support minimal float values, and support intermediate/master schedules and contractual milestones. Use of constraints and lead/lag are not minimized. Proper technical approach to critical path is not evident. Program lacks a valid critical path in which to assess schedule risk and the ability to forecast impacts to major critical subcontract work, downstream program milestones, etc. Risk is unacceptable even with contractor emphasis and close customer monitoring.

#### **Cost Risk - Evaluation Criteria:**

**Low (Green)** – PMB is executable within the project cost objectives for the authorized work scope. Baseline is derived from a sound BOE using historical data or similar programs and fully aligns with the project schedule. Values have been adjusted using documented assumptions/complexity factors. Budget values, time phasing, and breakout between labor/material/other direct cost assigned are reasonable.

**Medium (Yellow)** – PMB is marginally executable within the project cost objectives for the authorized work scope. Baseline is derived from a sound BOE using historical data or similar

programs and mostly aligns with the project schedule. Values have been adjusted using documented assumptions/complexity factors. Budget values, time phasing, and breakout between labor/material/other direct cost assigned are optimistic. May cause a moderate increase in cost. Special contractor emphasis and close customer monitoring will probably be able to overcome difficulties.

**High (Red)** - PMB does not fully address program requirements and is not executable within the project cost objectives for the authorized work scope. Baseline is not derived from a sound BOE using historical data or similar programs and does not align with the project schedule. Adjusted values do not have documented assumptions/complexity factors. Budget values, time phasing, and breakout between labor/material/other direct cost assigned are inadequate given funding, schedule, and resource constraints, and is likely to cause a significant increase in cost. Risk may be unacceptable even with contractor emphasis and close customer monitoring.

#### **Resource Risk - Evaluation Criteria:**

**Excellent (Green)** – Has little potential to cause disruption of schedule, increased cost, or degradation of performance. Normal supplier effort and normal customer monitoring will probably be able to overcome difficulties.

**Adequate (Yellow)** – Can potentially cause some disruption of schedule, increased cost, or degradation of performance. Special supplier emphasis and close customer monitoring will probably be able to overcome difficulties.

**Poor (Red)** – Likely to cause a significant disruption of schedule, increased cost, or degradation of performance. Risk may be unacceptable even with supplier or emphasis and close customer monitoring.

#### **Management Processes Risk - Evaluation Criteria:**

**Excellent (Green)** - Processes are in place for baseline maintenance, risk management, scheduling, EAC updates, subcontract management and managerial analysis. PMTs are appropriate, provide objective determination of progress, and correlate with technical achievement. These processes are formally documented and are being used to manage the program. Few issues have been identified with the processes or how they are being applied. Management processes will provide timely and accurate performance data. Has little potential to cause disruption of schedule, increased cost, or degradation of performance. Normal supplier effort and normal customer monitoring will probably be able to overcome difficulties.

**Adequate (Yellow)** – Most, but not all, processes are in place for baseline maintenance, risk management, scheduling, EAC updates, subcontract management and managerial analysis. PMTs could be more objective and correlate more closely with technical achievement. Some processes are not fully documented. Discussions indicate that the CAMs are not correctly using the management processes. There are concerns that the management processes may hinder timely and accurate performance data. Can potentially cause some disruption of schedule, increased cost, or degradation of performance. Special supplier emphasis and close customer monitoring will probably be able to overcome difficulties.

**Poor (Red)** – Few management processes are in place for baseline maintenance, risk management, scheduling, EAC updates, subcontract management and managerial analysis. PMTs are subjective and do not correlate with technical achievement. Processes are not documented. Discussions indicate that the CAMs are not using the management processes. There are concerns that the management processes will prevent accurate and timely performance data. Likely to cause a significant disruption of schedule, increased cost, or degradation of performance. Risk may be unacceptable even with supplier emphasis and close customer monitoring.

## APPENDIX I: Findings/Action Items Log

No.	Finding Type	IBR Area <i>(Technical, Schedule, Cost, Resources, Management Processes, or General)</i>	WBS/CA	CA Description	Title	Finding Description
	Finding	Technical				
	Action Item	Schedule				
	Finding	Cost				
	Finding	Resources				
	Action Item	Mgmt Processes				
	Action Item	General				

Issued Date	Customer POC	Supplier POC	Supplier Response	Supplier ECD	Response Adequate? <i>(Yes/No)</i>	Confirmation of Completion <i>(Objective Evidence)</i>	Status	Comments



## APPENDIX J: IBR Letter of Findings Template

To: <Supplier Contract Officer Name/Program or Project Manager Name, Company/Organization>

Subject: Notification of Integrated Baseline Review (IBR) Findings for <Project Name or Contract #>.

The <Project Name> IBR Team conducted an Integrated Baseline Review (IBR) of contract <Contract #> at your facility in <Supplier Address> during <Date of IBR>. The team identified Findings/Action Items, requests for documents and provided risk assessment as contained in attachment (1).

Status on action items and documentation requested should be directed to <IBR Coordinator Name> at <Phone Number & Email>. All requests should be completed by <Date>, unless other arrangements are made with <Review Team Lead Name> at <Phone Number & Email>.

Any contractual questions should be directed to <Project COR Name> at <Phone Number & Email> and earned value management questions should be directed to <Review Team Lead Name> at <Phone Number & Email>.

Regards,

---

<PM Name>

Project Manager

<Project Name> Project

Attachment 1: xxx

Cc: Government COR, Review Team Lead, Review Team Members

## APPENDIX K: IBR Report Template

<Project, Contract#> IBR Report

1. **Introduction.** Identify the contract purpose, type, duration, amounts (total, ceiling price, target costs, etc.), the project being supported, and the cognizant government component. Also, identify the specific contract requirement for an EVMS.
2. **Purpose.** Identify the purpose of the review.
3. **Scope.** Identify the specific contractual entity that is the subject of this review; for example, division, company, plant, and the functional organizations, such as engineering, manufacturing, quality assurance, or individual process teams. Discuss whether the review is related to development, production, or construction contract. Identify CWBS areas covered, the methodology used in conducting the review, indicating such items as range of CAM discussions, depth of review, documents examined, and traces conducted. Team members and their associated responsibilities should be identified in this section.
4. **Findings.** Identify Findings including a complete discussion of condition, cause and effect. If the Findings are not resolved by the time the report is written, a schedule for their resolution should be attached. During the course of the review, if Findings surfaced relative to the EVMS and its processes, these should be communicated to the appropriate personnel for proper resolution.
5. **Conclusions and Recommendations.** This portion of the report contains any conclusions and recommendations based on review Findings. This should include any action items and, if applicable, specific areas needing further review.

## APPENDIX L: IBR Close-out Letter Template

Date: <Current Date>

Company: <Company Name, Address>

Attention: <Supplier Contract Officer Name/Program or Project Manager, Organization>

Subject: Notification of Integrated Baseline Review (IBR) Closure

The <Project Name> IBR Team conducted an Integrated Baseline Review (IBR) of contract <Project Name or Contract #> at your facility in <Address> during <IBR Dates>.

All actions resulting from Findings from this review are closed, and/or have been agreed upon by all parties.

Any contractual questions should be directed to the COR: <Name, Phone, Email> and EVM/IBR questions should be directed to the IBR PM/Team Lead: <Name, Phone, Email>.

Regards,

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<PM Name>

Project Manager

<Project Name> Project

## APPENDIX M: Acronyms

ACO	Administrative Contracting Officer
ACWP	Actual Cost of Work Performed
BAC	Budget at Completion
BCR	Baseline Change Request
BCWP	Budgeted Cost for Work Performed
BCWS	Budgeted Cost for Work Scheduled
BOE	Basis of Estimate
CA	Control Account
CAM	Control Account Manager
CAP	Control Account Plan
CBB	Contract Budget Baseline
CCB	Change Control Board
COR	Contracting Officer Representative
CPR	Contract Performance Report
CWBS	Contract Work Breakdown Structure
DCAA	Defense Contract Audit Agency
DCMA	Defense Contract Management Agency
EIA-748	Electronic Industries Alliance-748
EAC	Estimate at Completion
ETC	Estimate to Complete
EVM	Earned Value Management
EVMFP	Earned Value Management Focal Point
EVMS	Earned Value Management System
EVMWG	Earned Value Management Working Group
FAD	Formulation Authorization Document
FAR	Federal Acquisition Regulation
IBR	Integrated Baseline Review
IMS	Integrated Master Schedule
IPMR	Integrated Program Management Report
JPL	Jet Propulsion Laboratory
KDP	Key Decision Point
LCCE	Life Cycle Cost Estimate
LOE	Level of Effort
MDAA	Mission Directorate Associate Administrator
MR	Management Reserve
NASA	National Aeronautics and Space Administration
NASA FAR	NASA Federal Acquisition Regulation
NEN	NASA Engineering Network
NDIA	National Defense Industry Association

NFS	NASA FAR Supplement
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
OBS	Organization Breakdown Structure
OCFO	Office of Chief Financial Officer
P-CAM	Project-Control Account Manager
PDR	Preliminary Design Review
PM	Program or Project Manager
PMB	Performance Measurement Baseline
PMT	Performance Measurement Techniques
PPB	Project Budget Base
PP&C	Program Planning & Control
RAM	Responsibility Assignment Matrix
RFP	Request for Proposal
SME	Subject Matter Expert
SOW	Statement of Work
SP	NASA Special Publication
SRB	Standing Review Board
STAT	Schedule Test and Assessment Tool
STI	Scientific and Technical Information
ToR	Terms of Reference
UB	Undistributed Budget
UFE	Unallocated Future Expense
WAD	Work Authorization Document
WBS	Work Breakdown Structure
WP	Work Package

## APPENDIX N: 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. ACWP reflects the applied direct costs and may be for a specific period or cumulative to date. (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.

**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 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 Performance Report (CPR).** A contract data requirement when EVM is required. This report consists of five formats containing data for measuring contractors' cost and schedule performance on Government acquisition contracts: 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. See Integrated Program Management Report (IPMR).

**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.** See 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, PMTs for each work package, responsible performing organizations and at least one charge number.

**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 (EVMFP).** 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 EVMFP 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 Management Working Group (EVMWG).** A group consisting of the EVM Subject Matter Experts from each center other subject matter experts 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. This integrated management system and its related subsystems 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.** The set of 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.  $EAC = \text{Inception to date ACWP} + \text{ETC}$ .

**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 (or MSOD) to authorize the formulation of a program whose goals will fulfill part of the Agency's Strategic Plan, Mission Directorate Strategies, or Mission Support Office Functional Leadership Plans. In addition, a FAD or equivalent is used to authorize the formulation of a project.

**In-House (EVM).** Project work scope conducted solely using NASA Headquarters and/or Center personnel or other NASA resources (i.e., facilities, equipment), including support contractors that augment NASA resources to achieve the objectives of the project. There is no prime contractor, university, laboratory, institution, or foreign partner involvement in in-house work.

**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 performance measurement baseline (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 IPMR Format 6.

**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. This is a contract data requirement when EVM is required. 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.

**Joint Cost and Schedule Confidence Level (JCL).** (1) The probability that cost will be equal to or less than the targeted cost AND schedule will be equal to or less than the targeted schedule date. (2) A process and product that helps inform management of the likelihood of a project's programmatic success. (3) A process that combines a project's cost, schedule, and risk into a complete picture. JCL is not a specific methodology (e.g., resource-loaded schedule) or a product from a specific tool (e.g., @RISK).

**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.

**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 the 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.

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

**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 CA 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 Control Account Manager (P-CAM).** 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.

**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.

**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 chart showing the relationship between the CWBS elements and the organizations assigned responsibility for ensuring their accomplishment. The RAM normally depicts the assignment of each control account to a single manager, along with the assigned budget.

**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 its 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.

**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, statement of work, scheduled start and completion dates, budget, and the name of the P-CAM.

**Work Breakdown Structure (WBS).** The product-oriented hierarchical breakdown or division of 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).** Natural subdivision of control accounts. A WP is simply a task/activity or grouping of work. A WP is the point at which work is planned, progress is measured, and earned value is computed.



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