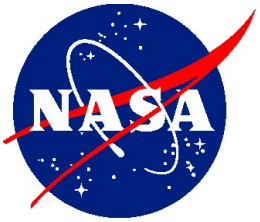

Integrated Baseline Review (IBR) Handbook

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

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Electronic copies are available from

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NASA STI Information Desk
Email to: help@sti.nasa.gov/
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RECORD OF REVISIONS		
REV LTR	**DESCRIPTION**	**DATE**
A	Basic Issue	June 30, 2005
B	First Revision – Miscellaneous Minor Changes	July 7, 2006
C	Second Revision – Miscellaneous Minor Changes	October 5, 2009
D	Third Revision – NPR 7120.E Updates	September 17, 2012
E	Fourth Revision – PCD 15-05 Update, minor changes	November 18, 2015
F	Fifth Revision – Miscellaneous Minor Changes	January 15, 2018
G	Sixth Revision – Miscellaneous Minor Changes	January 30, 2019
H	Seventh Revision – Miscellaneous Minor Changes	October 16, 2019
I	Eighth Revision – NPR 7120.5F Updates	November 2021
J	Ninth Revision – Miscellaneous Minor Changes	January 2022
K	Tenth Revision – Miscellaneous Minor Changes	January 2023
L	Eleventh Revision – Miscellaneous Minor Changes	December 2023
M	Twelfth Revision – IBR Updates	March 2025
N	Thirteenth Revision – Streamlined IBR Approach	September 2025
O	Fourteenth Revision – NFS Update	November 2025
P	Fifteenth Revision – Miscellaneous Minor Changes	February 2026

P.0 PREFACE

P.1 Purpose

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 an 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.

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

P.2 Applicability

An IBR is applicable and beneficial to projects and contracts of all sizes and types. However, the level of detail and formality of the review will vary based on dollar value, risk, and need for management insight.

NASA has many reviews during the program and project lifecycle, and some of these reviews share common goals and objectives of an IBR. It is important to understand the differences and ensure that the intent of an IBR is met with adequate time for Control Account Manager (CAM) discissions and supported by key subject matter experts.

The duration of an IBR is based on the number of Control Accounts (CAs) under review, not a predetermined timeframe. An IBR's duration is determined by scheduling adequate time to cover 85% of the total baseline value, including all high dollar and high risk CAs as well as critical path CAs. Reviewing material and Level of Effort (LOE) CAs is encouraged as time permits to ensure adequate coverage of the baseline.

P.3 Authority

This handbook provides Earned Value Management (EVM) and IBR guidance for NASA Headquarters, NASA Centers, and suppliers (e.g., Caltech Jet Propulsion Laboratory (JPL), Johns Hopkins University-Applied Physics Laboratory (APL), Southwest Research Institute (SwRI), other contractors, universities, etc.) to the extent specified in the contract or agreement.

According to the OMB Circular A-11, Part 7, agencies are required to implement IBRs or baseline validation processes as part of an overall investment risk management strategy. The following supplements, directives and requirements provide information on the direction for EVM:

- NASA Federal Acquisition Regulation Supplement (NFS)
- NASA FAR Supplement Companion Guide
- NASA Procedural Requirements (NPR) 7120.5, *NASA Space Flight Program/Project Management Requirements*

- OMB Circular A-11: Planning, Budgeting, and Acquisition of Capital Assets, Part 7, Capital Programming Guide, Section 1.5.5.1 Earned Value Management

P.4 Terminology Context

This handbook serves two roles regarding Supplier 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 where the Mission Directorate (MD) or program office conducts an IBR. The project office will conduct an IBR for Suppliers (e.g., JPL, APL, SwRI, other contractors, universities, etc.) because they are external to NASA. More detail can be found in section 2.2 Determination of IBR Need.
- The term Control Account Manager, "**CAM**" acronym herein refers to both the government CAM and industry CAM.

P.5 References

- NASA EVM website https://www.nasa.gov/ocfo/ppc-corner/evm/
- NASA Procurement Class Deviation (PCD 25-05A) *CLASS DEVIATION FROM NASA FAR SUPPLEMENT (NFS) PART 1834 TO IMPLEMENT THE REVOLUTIONARY FAR OVERHAUL (RFO) (NASA Case 2025-N006),* June 26, 2025 https://www.nasa.gov/ocfo/ppc-corner/evm/regulations//regulations
- NASA FAR Supplement (NFS) Companion Guide
- *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 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)*
- DoD Earned Value Management System Implementation Guide (EVMSIG)
- DoD Earned Value Management Implementation Guide (EVMIG)
- OMB A-11, Part 7 Capital Programming Guide

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 the Chief Financial Officer (OCFO), Deputy CFO Strategic Insights and Budget (SIB) at NASA Headquarters, 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/ocfo/ppc-corner/evm/.

1.0 INTRODUCTION

1.1 Background

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 Performance Measurement Baseline (PMB) and to ensure that the PMB is realistic for accomplishing all the authorized work within the authorized schedule and budget.

It's important that the Customer and Supplier project has a common understanding of the IBR process. Basically, the Who, What, Where, When, and Why?

- Who participates in an IBR?
- What is an IBR?
- Where is an IBR conducted?
- When does an IBR occur and how often?
- Why is an IBR required and needed?

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

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

The PMB is the time-phased budget plan whereby performance will be measured for accomplishing all authorized work scope in a project's life cycle. Establishing the PMB is a 3-step process: 1) Define the work, 2) Schedule the work, and 3) Allocate budgets to the work. It includes both NASA internal and supplier budgets. The project's performance against the PMB is measured using objective Performance Measurement Techniques (PMT). Projects that do not require EVM can hold an IBR and determine the best method for tracking performance given the unique characteristics of the project. The PMB does not include Management Reserve (MR) or Unallocated Future Expense (UFE).

Objectives and benefits of an IBR

An IBR is a critical process designed to ensure alignment, transparency, and confidence in program execution. Its objectives and benefits include:

- **Establish Shared Understanding:** Promote comprehensive customer and supplier knowledge of the PMB.

- **Enhance Communication:** Facilitate clear dialogue by comparing customer and supplier perspectives on technical, schedule, and cost objectives, identifying and resolving discrepancies early.
- **Validate Baseline Integrity:** Confirm that the PMB encompasses the full scope of work, is achievable, and supports all technical, schedule, and cost commitments.
- **Enable Risk Management:** Provide deep insight into PMB risks and opportunities, allowing proactive mitigation and exploitation strategies.
- **Clarify Technical Goals:** Ensure technical performance targets and functional exit criteria are clearly defined, mutually agreed upon, and properly documented.
- **Strengthen Measurement Practices:** Verify that appropriate and meaningful PMTs are applied to work packages.
- **Assess Supplier Processes:** Give the customer confidence in the supplier's integrated approach to technical, schedule, and cost management and measurement.
- **Support Informed Decision-Making:** Evaluate the PMB's ability to deliver timely, reliable, and actionable data on schedule, cost, scope, and risk for effective program governance.

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

IBRs are the most misunderstood review at the Agency relative to purpose/objectives, execution, timing, etc. Through training and proper communication, the Agency can dispel these misperceptions that IBRs are burdensome, have extensive prep time, presentations must be developed, the project must stand down for a lengthy period, etc. Therefore, it is also important to understand that IBRs are:

- Not a one-time event
    - IBRs occur throughout the project lifecycle.
- Not an inspection or audit
    - It is a small group discussion/data demonstration of the baseline plan
- Not a technical design review (Preliminary Design Review (PDR), Critical Design Review (CDR), a Key Decision Point (KDP) Review with a board, an EVMS Compliance Review, a monthly status/performance review, an independent review, or "presentation"
- Not a time to resolve technical issues or IBR findings
    - Maintain focus on the PMB during CAM Discussions. The clock is running
- Not a pass/fail event
    - There's always Findings, risk rate IBR areas for severity
    - Customer remains engaged with Supplier project to satisfactorily disposition Findings
- Not a demonstration of Earned Value Management System (EVMS) compliance
- Not an opportunity to redirect, change the contract, nor is driven by an undefinitized contract action

The Streamlined IBR Process with Pre-KDP C IBRs

The Streamlined IBR approach is designed to align with Pre-KDP C IBRs in direct support of the Agency's IBR Improvement Initiative. This optional process offers a more efficient method for

conducting project-level IBRs by integrating activities across the Pre-, During-, and Post-Event stages while maintaining the rigor of traditional IBR components.
Key features include:

- **Targeted CAM Engagement**: CAMs participate only in their scheduled discussions, eliminating the need for lengthy presentations or PowerPoint decks.
- **Cost and Time Savings**: Virtual execution reduces travel and administrative overhead while preserving review integrity.
- **Enhanced Collaboration**: Promotes proactive, positive relationships among stakeholders and strengthens CAM ownership of baseline data.
- **Advocacy and Understanding**: Builds greater program-level support for IBR principles, execution, and alignment with mission objectives.
- **One-Step & Two-Step PDR Process**: Ensures understanding of the timing both types of PDRs and when the Pre-KDP C IBR should occur.

For detailed guidance, refer to **Appendix N**.

Pre-KDP C IBRs serve as a programmatic readiness checkpoint. It aims to evaluate the maturity and credibility of preliminary planning artifacts and ensure that NASA stakeholders—particularly at the mission, directorate, and agency levels—are well-informed ahead of formal Confirmation. It provides a structured opportunity to examine preliminary scope, schedule, and cost data, even in the absence of fully awarded implementation contracts or a complete PMB.

In addition, it is designed to help identify planning gaps, risk posture, and policy compliance issues early enough to influence key decisions, while acknowledging the constraints inherent to pre-Confirmation project states. This approach also fosters continuity by building toward a more robust, post-KDP C IBRs, informed by early insights and stakeholder engagement.

1. Purpose and Scope Clarification

- Pre-KDP C IBRs serve as a key programmatic readiness assessment to:
  - Gauge the viability of the preliminary PMB.
  - Identify critical gaps in planning that must be resolved for KDP C confirmation.
  - Provide evidence of compliance with key agency policies (e.g., NPR 7120.5, 7123.1, specific center policies, etc.).
- The outcome of Pre-KDP C IBRs should be a risk-informed programmatic status, identifying:
  - Key maturity gaps needing resolution prior to Confirmation.
  - Summary readiness indicators tied to the five risk areas of an IBR (technical, schedule, cost, resources, and management processes).
- Pre-KDP C IBRs provide an audit trail for future KDP C decision-making.

2. Pre-KDP C Event Timing and Sequencing

- Conducted around the mission level PDR timeframe:
  - Preliminary PMB data (LCC, schedule, WBS, etc.) is available.
  - For development elements >$50M, preliminary PMB must be established within 2 months post-mission level PDR prior to KDP C for a Two-Step PDR. For a One-Step PDR, preliminary PMB must be established on or before the PDR and is tailored by the PM.

- A formal IBR must be held within 6 months post-KDP C, and subsequent IBRs as required.

3. Pre-KDP C IBRs Data Expectations and Content

- Preliminary PMB components (scope, schedule, cost)
- Reserves and margin posture
- Acquisition strategy and contracting status
- Risk and opportunity register (focused on implementation risks)
- Traceability to mission success criteria and constraints
- Standard EVM IBR documents are included, but emphasis is placed on preliminary PMB at this stage.

4. Stakeholder Engagement

- Standing Review Board (SRB), Headquarters, and Procurement Office attendance encouraged at Pre-KDP C IBR's in briefs/out briefs and subsequent IBRs in briefs/out briefs.

5. Post-KDP C Updates

- A formal mission-level IBR shall occur within 6 months of KDP C once:
  - All implementation scope is awarded.
  - A complete PMB is established and resourced.
- Pre-KDP C IBR artifacts can serve as the foundation for follow-on IBRs supporting continuous evaluation and assessments.

6. Policy Integration and Documentation

- Clearly integrate this pre-KDP C IBR into the baseline review lifecycle (e.g., as part of PDR data expectations).
- Artifacts should be archived and accessible, and compliant with:
  - NPR 7120.5, NPR 7123.1, PP&C Handbook, IBR Handbook, and other center or mission-specific requirements.

1.2 Requirements

IBRs are required whenever EVM is required:

- **For In-house projects:** NPR 7120.5F, 2.2.8.3: Integrated Baseline Reviews (IBRs) are required whenever EVM is required. 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.

- **For Contracts:** NASA FAR Supplement 1852.234-2 Earned Value Management System (June 2025 (Deviation), section (c): The Government shall conduct Integrated Baseline Reviews (IBRs)). IBRs shall be conducted within 180 calendar days after contract, subcontract, or task order award, or the exercise of significant contract options, or within 60 calendar days after distribution of a supplemental agreement that implements a significant funding realignment or effects a significant change in contractual requirements (e.g., incorporation of major modifications). The objective of IBRs is for the Government and the Contractor to jointly assess the Contractor's Performance Measurement Baseline (PMB) to

ensure complete coverage of the statement of work, is completely planned, sound schedule, logic exists and follows best practices, adequate resourcing, and identification of inherent risks, etc.

- **NASA FAR Supplement Companion Guide. Integrated Baseline Review's Guidance (previous PIC 24-05.**

(a) Earned Value Management (EVM) (See FAR 34.2 and NFS 1834.2) is one of NASA's and industry's most powerful proven program management tools for over 50 years. Government and industry program managers use EVM to provide joint situational awareness of program status; assess cost, schedule, and technical performance on programs; and support proactive decisionmaking as program teams navigate constraints and risks in the performance of programs.

(b) As a program management system, EVM practices and competencies must be integrated into the program manager's acquisition decision-making processes. The data provided by the EVM System (EVMS) must be timely, accurate, reliable, auditable, and implemented in a disciplined approach consistent with the EIA-748, EVMS Guidelines. The Office of the Chief Financial Officer serves as the EVM policy and competency owner and ensures that EVM requirements and guidance are current and correct (see NPR 7120.5).

(c) IBRs are a critical component of EVM, establishing a common understanding and baseline for the program within 180 days of contract, subcontract, or task order award. Delays in completing an IBR introduces greater risk to the Government and Industry partners in executing requirements, within cost and schedule. NASA promotes an incremental approach for conducting an IBR to facilitate communication and ensure a common understanding of the approved contract work scope, budget, schedule, and risks at contract award or before.

(d) EVM is a cost-effective system that shares program situational awareness between the Government and contractor. In an oversight role, a critical function of the Government Program Office is to utilize all data, including cost, schedule, and technical performance metrics, to identify early indicators of problems so that adjustments can be made to make effective decisions and influence future program performance. The decision to apply EVM and the related EVM reporting requirements should be based on work scope, complexity, and risk along with the threshold requirements in the NFS.

(e) A contract is awarded based on a plan as it relates to EVM (e.g., schedule, basis of estimate, technical approach, risks). An IBR is not a one-time occurrence or event, but rather a process to allow the Government and the contractor to jointly assess the plan for completing the contractual scope of work. In accordance with NFS 1852.234-2(c), an IBR should be conducted as early as practical for the program to ensure an understanding and agreement of the performance measurement baseline (PMB). A letter from the Contracting Officer (or other communication) to the contractor may be needed to clarify initial IBR requirements.

(f) An IBR must be conducted within 180-calendar days after contract, subcontract, or task order award, even if it does not cover the entire scope of an (priced or unpriced) contract action. In situations where the entire work scope is not completely known within 180 calendar days, an IBR can be conducted in stages, such as with an Undefinitized Contract Action (UCA). However, a review of the known scope of work should be conducted within the 180-calendar day window, with follow-up IBRs scheduled for the work not yet completed in the context of the entire PMB. As a rule of thumb, the initial IBR should extend through the first major milestone for the program. Any IBR event increment should not be driven by contract definitization but should represent the best time to assess the plan of work. A timely and thorough IBR is to the benefit of all parties involved including the Government and the contractor.

Because IBRs are performed on a relatively infrequent basis, their purpose, importance, and expectations are frequently misunderstood. There is a common misperception that IBRs are a one-time event or can only be done after PDR, or at Phase C, after contract definitization, etc. The NFS and NPR 7120.5 are clear on the timing of IBRs Suppliers projects.

IBRs are in fact conducted many times throughout the program/project lifecycle (delta IBRs, major modifications, contract options, rebaselining due to a breach in the Agency Baseline Commitment (ABC), reprogramming due to an Over-Target Baseline/Over-Target Schedule (OTB/OTS).

Although this approach is not recommended, due to the risk of delaying an important review needed to measure progress against the baseline plan, creating confusion within the Project Management Office (PMO), and lacking consistency across Mission Directorates, if contracts or task orders are awarded to suppliers by phase, the expectation is to apply the NFS and conduct an Integrated Baseline Review (IBR) at the award of each phase (see NASA Office of JPL Management and Oversight (NOJOMO) and Office of Procurement (OP) for additional guidance).

It is likely that a deviation from the NFS may be requested during Phase A, as products are typically too immature at the start of this phase. Development work generally begins in Phase B and continues through Phase D. An IBR may also be conducted in Phase E if significant development work (added scope) is introduced to an operational system that meets the threshold requirements.

Keep in mind that the frequency of IBRs is independent of the phase, except for the initial award. This means a project may conduct multiple IBRs within a single phase

Therefore, IBRs are required when the PMB is first established, and shall occur whenever changes to the PMB (e.g. rebaselines, funding realignments, significant scope change which increases or decreases the PMB, negotiated equitable adjustments resulting from issuance of a change order, reflect other agreements) become significant enough that a new mutual understanding between all parties is necessary. When reprogramming occurs, OTB/OTS with government approval, this shall also require an IBR. The project phase is not a consideration.

While new risks/opportunities may be identified and actions tracked because of an IBR, it is important to note that an IBR is not a pass/fail event. Completion is contingent on meeting an IBR's objectives. Delta IBRs are typically the result of poor planning (i.e., incomplete/immature cost, schedule,

technical content, lack of training, inexperienced staff, etc.). Thus, it is paramount that the customer ensures the supplier's readiness to conduct an IBR. In addition, during the overall IBR, CAMs are not graded (or color-coded) since an IBR is not a pass/fail event. However, the five risk areas have evaluation criteria which are colored coded. See **Appendix H** for details.

2.0 INITIATION

2.1 General

The IBR process encourages reliable, up-front planning and ensures that a PMB is well understood and is being properly implemented. A primary goal of the risk-based review is to assess existing risks and the Supplier project's plans for mitigating them. It is also the time to identify new risks (and/or opportunities) that may impact project execution. This is accomplished by understanding the PMB (the plan) and how it was established, and in the end all parties walk away with a mutual understanding and confidence that the baseline plan is realistic and achievable given the risks, and budget/schedule constraints.
The IBR process will include the activities listed below.

- A review of the documentation that establishes the PMB will occur prior to and during an IBR. This will include technical scope, cost Estimates-to-Complete (ETCs), Basis of Estimates (BOE), budgets, resource plans, schedules, PMTs, etc. Findings/Action Items will be generated and submitted because of an IBR and from the supplier subcontractor's IBRs findings.
- Conducting data traces is part of the pre-activities and preliminary analysis that is done prior to an IBR event and is used to formulate specific questions. The analysts performing the analysis can also utilize some of the sample questions in the IBR Handbook that are part of their area of expertise. Data traces combined with analysis are vital to understanding the entire scope is captured, data is adequate and integrated and follows management processes.

    - TECHNICAL (e.g., Statement of Work (SOW)/Project Plan -> Contractor Work Breakdown Structure (CWBS) -> CWBS Dictionary -> Technical Performance Measures (TPM) -> Control Account Plans (CAP))
    - SCHEDULE (e.g., Integrated Master Schedule (IMS) (summary, intermediate, detailed schedules) -> critical path(s) charts -> Work Authorization Document (WAD) period of performance -> CAPs -> other reports/analysis)
    - COST (e.g., BOEs w/assumptions -> WAD -> CAPs, time-phased budget in Cobra or other tools)
    - RESOURCES (e.g., -> Facility Schedule -> Critical Materials, etc.) BOEs -> WADs -> Staffing -> CAPs -> IMS)
    - MANAGEMENT PROCESSES (e.g., PMTs -> Risks w/ mitigation plans -> Management Reserve -> Estimate at Complete (EAC) examples/process -> Variance Analysis Reports (VAR) examples/process, baseline maintenance (Baseline Change Request (BCR) Log) -> subcontractor management)

- IBR training to familiarize the review team with the IBR process, purpose, and documentation. Also, a supplier discussion regarding expectations of an IBR is recommended.
- A short in-brief by the customer/supplier consisting of the project overview, intent of an 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. During the CAM Discussions the CAM also needs to demonstrate the data artifacts by pulling them up and walking through the data which may prompt additional questions.

- 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 an IBR.

2.2 Determination of IBR Need

As mentioned previously (see section **1.2 Requirements**), IBRs are required whenever EVM is required. 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 Supplier work should be identified within the program and project plan. As per 7120.5, In-house work is defined as 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.

The requirement for contract IBRs is contained in NFS Part 1852. The requirement for In-house 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 (PM).

Including the clause at 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 IBRs in the Statement of Work (SOW). This will ensure that clear expectations are established and provide NASA the ability to tailor IBR requirements.

3.0 PLANNING

3.1 IBR Preparation

The customer should begin preparation for an IBR as soon as practical after determining the need based on requirements. The PM should appoint an IBR Coordinator and a Review Facilitator early to help plan and conduct an IBR. The IBR Coordinator helps coordinate various activities to ensure an efficient IBR. An IBR Facilitator provides EVM expertise to the team. The roles of an IBR Coordinator and Review Facilitator are further described below. See **Appendix B** for a sample checklist of IBR activities, flow chart and schedule.

The first step in planning an IBR is to determine which Control Accounts (CAs) will be reviewed at an IBR. A dollarized Responsibility Assignment Matrix (RAM) that shows the budget separately broken out for each CA will help in this assessment. See **Appendix C** for an example of a dollarized RAM. The dollarized RAM must be requested from the supplier early on to help with the planning. Typically, 85% of the total dollar value CAs are to be reviewed, which includes all high dollar, high risk, and those CAs on the critical path. If time allows, consider at least one LOE and one material CA is included to provide insight into various aspects of the project. The PM, with advice from the Review Facilitator, should choose the CAs for an IBR and inform the supplier of the ones selected. This will also form the basis of an IBR agenda. It's important to note that an IBR's duration is not predetermined before a review of the CAs to be assessed has been accomplished. At least two hours for CAM Discussions are needed to ensure a meaningful IBR. See **Appendix D** for a sample 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., CAM counterparts, system engineering, manufacturing, integration and test, etc.). When appropriate, the team may include Defense Contract Management Agency (DCMA) personnel for awareness and/or participation in CAM Discussions. There may be several sub-teams with discussions scheduled concurrently based on the amount of CAs to be assessed. 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 4 people or so per team, and equivalent on supplier side. Ideally, 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. Again, it is recommended to allow at least two hours to conduct the CAM discussions and 30 minutes for caucus and to complete the CAM Discussion Assessment Form.

3.2 Customer Team Roles and Responsibilities

An 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 an IBR. Team members are expected to:

- Ensure IBR objectives and expectations are clear
- Understand your assigned roles and responsibilities for an IBR/CAM Discussions
- Participate in team meetings, and attend training sessions to prepare for the documentation review/data traces and CAM Discussions
- Become familiar with control account data and any other supplementary information provided to formulate specific questions

- Prepare and submit potential findings/action items in a timely manner to IBR Coordinator (see CAM Discussion Assessment Form)
- Ensure all findings (i.e., new risks) are documented by factual evidence in accordance with 5 risk areas
- Assist the Review Leader with preparation of the Out-brief, IBR Log, and IBR Report

Program or Project Manager (PM)/Team Leader/Review Leader: The PM either acts as or assigns the Team Leader for an IBR. The overall responsibility of conducting an 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.

- Oversees and approves activities associated with the review (IBR strategy, team planning, meetings, agendas, etc.)
- Ensures the IBR team is staffed with qualified technical Subject Matter Experts (SME) and analysts, and approves team assignments
- Ultimate responsibility for the IBR readiness decision and final PMB assessment
- Approves the risk evaluation criteria to categorize the risks identified at an IBR: cost, schedule, technical, resources, and management processes
- Oversees development and coordination of the out brief and IBR Report to document findings and action items
- Conducts joint in brief with Supplier project, and solely conducts a brief out brief

IBR Coordinator: The Team Leader appoints 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:

- Assists with planning, training, data collection/distribution, team meetings, etc.
- Coordinates all logistics (travel, meeting rooms, conference rooms, security requirements, etc.)
- Collects CAM Discussion Assessment Forms, maintains IBR Log, and supports the Review Leader and Review Facilitator throughout the IBR process. 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.
- Ensure that data submitted by supplier meets the requirements stated in the IBR notification letter.
- 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 the 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 (MS Teams, SharePoint, etc.) Team members should ensure they have access to the data.
- Distribute IBR forms, electronic format, to team members prior to 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, or a member of the Agency EVM team. The items listed below are provided as a recommended guide to assist the facilitator.

- Understand the Supplier project EVM System, monthly business rhythm, reporting requirements
- Supports the Review Leader as required with activities related to the entire IBR process
- Provides IBR training
- Provides overall EVM guidance to team members
- Elevates any issues to Review Leader for resolution
- Assists Review Leader with development of risk evaluation criteria
- May participate in CAM Discussions to achieve mutual understanding of the baseline
- Complete CAM Discussion Assessment Form, document potential findings/action items
- Report to Review Leader daily
- Assist the Review Leader with preparation of the Out-brief, IBR Log, and IBR Report

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

- Lead CAM Discussions in their technical area of expertise
- Assess technical areas of expertise by conducting data traces and data review, formulate specific questions
- Achieve mutual understanding of the baseline with counterparts
- Complete CAM Discussion Assessment Form, document potential findings/action items
- Lead CAM Discussion Caucus and support Daily Caucus
- Report to Review Leader daily

Cost/Schedule/Resource Analysts: The responsibilities include:

- Assess earned value data, budget, resources, and schedule areas of expertise by conducting data traces and data review, formulate specific questions
- Support Sub-Team Technical Lead with CAM Discussions
- Achieve mutual understanding of baseline with counterparts
- Complete CAM Discussion Assessment Form, document potential findings/action items
- Support CAM Discussion Caucus and Daily Caucus

Other's (Other Technical SMEs, Contracts, Business Office, DCMA, etc.): The responsibilities include:

- Must have roles and responsibilities, and held accountable for products by conducting data traces and data review, formulate specific questions
- May participate in baseline discussions, typically depends on the forum

- Support Sub-Team Technical Lead with CAM Discussions
- Achieve mutual understanding of baseline with counterparts
- Complete CAM Discussion Assessment Form, document potential findings/action items
- Support CAM Discussion Caucus and Daily Caucus
- 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 CA information.

3.3 Determination of Readiness

Prior to an 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.
- The data, for analyzing performance trends, can be useful to see if the baseline being reviewed is experiencing issues; however, it is not required. Again, the purpose of an IBR is to review the baseline plan and should not be delayed because performance data is requested. See the timing of IBRs and NFS requirements.
- Look for detail planning to the Work Package (WP) level for six months to one year to ensure an adequate assessment of the baseline.
- IBRs on subcontractors with flow down requirements should be complete prior to project-level IBR. Alternatively, prime contractor or program integrator offices utilize a good proposal evaluation practice for changes in scope.
- All preliminary documentation requested in an IBR Notification Letter has been assessed to ensure the customer/supplier is ready for an on-site review. If it is determined that the requested documentation is incomplete or inadequate, an on-site IBR should be rescheduled or a delta IBR considered. For supplier IBRs, follow NFS requirements on timing of IBRs. Any deviation to this must be approved by the Contracting Officer and notify 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 an on-site IBR. An IBR is not just putting a check in the box and adequate time should be allocated for an IBR duration based on the number of CAs to be reviewed and number of teams conducting CAM discussions. As discussed previously, typically 85% of total dollar value CAs are to be reviewed, which includes all high dollar, high risk, any CAs on the critical path, and if time permits reviewing an LOE/material CAs.

If after an IBR, the PM does not feel that an IBR met the objectives, significant deficiencies were identified relative to PMB maturity (although this should be determined at IBR Readiness), 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/traces and CAM Discussions (the heart of an IBR).

3.4 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, preliminary agenda, documentation request, logistics (example: security access needs, IT equipment, full team conference room, CAM Discussion rooms, etc.), IBR team members and roles, and points of contact for follow-up. See **Appendix A** for an IBR notification letter template. For contracts, an IBR notification letter should be sent from the government Contracting Officer Representative (COR) to the contractor organization. The local DCMA rep, if applicable, should also be informed of an IBR as well.

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

Table 1 Documentation List

#	Artifact	Special Instructions
1	RAM $	Dollarized-Responsibility Assignment Matrix ($RAM) – Primary data artifact to begin IBR planning (preferred format Excel)
2	WBS*	Contract Work Breakdown Structure (CWBS), CWBS Dictionary (WBS In-house). Only if changed since formal submittal. Must meet content requirements identified within the DRD. SOW Para Identification
3	OBS	Organizational Breakdown Structure (OBS) at control account level
4	SOW	Statement of Work (SOW), or Project Plan including major deliverables (In-house)
5	Project Plan	Including the EVM Implementation Plan, if available
6	Supplier List	Supplier/subcontractor List (include type, supplier, contract value, flow down requirements)
7	WAD	Work Authorization Documents (WADs) or equivalent
8	CAP	Time-phased, resource loaded Control Account Plans (CAPs). (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 with time-phased budget (BCWS) and forecast (ETC). In addition, include performance (BCWP) and actual costs (ACWP), if available. Native file format required, (preferred format Excel)
9	BOE	Basis of Estimates (BOEs) (Include WBS, tasking, labor categories for time-phased budget with justification, material BOM, assumptions/ constraints, estimating method (e.g., analogy, bottoms up, parametric) and risks at CA level)
10	Performance reporting (if available) *	Integrated Program Management Report (IPMR)* or Integrated Program Management Data Analysis Report (IPMDAR)* data sets, and/or project performance reports/monthlies (include latest Estimate at Completion (EAC) with supporting documentation)
11	Staffing	Staffing Plans/charts

#	Artifact	Special Instructions
12	IMS*	Integrated Master Schedule (IMS)* in native file format w/ proper coding (e.g., CA, WP, PP, PMT, SVT, Margin, etc.). Include any detailed schedules and summary schedule (one pager)
13	Schedule Data	Schedule data dictionary, critical path(s) reports, Schedule Risk Assessment (SRA), other schedule metrics including health checks, Basis of Schedule (BOS)
14	Risk List	Risk Register with quantified cost/schedule impacts and mitigation plans, any opportunities
15	Material List	Critical Materials List, and High/low dollar threshold
16	Logs	Baseline Control Logs (Baseline Change Request, Management Reserve, Undistributed Budget, Schedule Reserve, etc.)

* Data Requirements Description (DRD)

Table 2 Supplemental Documentation List

#	Artifact	Special Instructions
1	SDD*	Supplier EVM System Description Document*, or NASA In-house Project's EVM Implementation Plan (move to supplemental data)
2	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 (move to supplemental data)
3	Latest Estimate at Completion	Including supporting documentation
4	NASA form 533 M/Q*	If applicable

* Data Requirements Description (DRD)

Request only the data that has not already been received. Although the government should have issued a DRD for the EVM System Description (EVMSD), these documents are typically proprietary, and suppliers may be reluctant to non-government IBR team members. However, the suppliers should provide an overview of their IBR Processes, Monthly Business Rhythm during the In Brief. The nature of the CAM discussions will satisfy aspects of the suppliers EVMSD. Also, this list is not all-inclusive and can be tailored based on information required for preparation and insight. The supplier may have the data described above in different formats or names, and these documents are acceptable, but the native file formats are requested for analysis purposes. Also, make sure supplier is clear on an 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 an on-site IBR should be rescheduled. However, keep in mind the NFS requirements on timing of IBRs. Suppliers should know prior to contract award of NASA IBR requirements. Questions may be held for discussion at an IBR or can be provided to the supplier prior

to an IBR, allowing time to respond prior to an 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.

3.5 Training

Training should be conducted at a pre-IBR meeting. Joint Customer/Supplier IBR training is beneficial to an IBR by ensuring all IBR participants have a clear understanding of expectations. The supplier can 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, an IBR is not an EVM compliance review or EVMS guideline discussions.

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 on SATERN and/or by contacting the NASA Center or Mission Directorate EVM FP. Names of members and contact information are listed on the NASA EVM website at https://www.nasa.gov/ocfo/ppc-corner/evm/.

The training and documentation review should occur prior to an 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 an on-site review.

3.6 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 conference rooms, CAM Discussion rooms that support the number of team members, and any working rooms for the IBR Team.
- Scheduled times for CAM Discussions and other project management staff and ensure all personnel are available. This needs to be reconfirmed prior to an IBR in case any adjustments need to be made due to CAM availability, or arrangements need to be made to hold a special CAM discussion at an alternate time if a CAM becomes unavailable.
- IT equipment for main conference room, and CAM Discussion rooms should be tested prior to event to avoid any unnecessary delays.

4.0 EXECUTION

4.1 General

The preparation and planning done up to this point will the team is ready for an 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 an IBR.

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

4.2 On-site Discussions

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

4.3 In Briefs

4.3.1 Joint IBR Team and Supplier

The IBR Team Leader should provide an in-brief to the supplier at the start of an IBR. The main theme of this discussion is to re-emphasize that the purpose of an 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.

4.3.2 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.

4.3.3 CAM Discussions

The CAM Discussions are the heart of an IBR. These discussions focus on five IBR risk areas (technical, schedule, cost, resources, and management processes. Overall success of IBR results is 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 an IBR.

4.3.4 CAM Discussion Guidelines

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

- Utilize the CAM Discussion Assessment Form. See **Appendix F**
- 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.
- You should also take notes when not speaking and compare during the team caucus.
- Prior to the CAM discussions, 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 traces 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, can demonstrate data artifacts during the CAM Discussion, 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, for the most part. 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 demonstrate artifacts 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).

4.3.5 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.

CAM Discussion Assessment Form: Team members should complete these forms prior to, during, and after each CAM discussion. The Sub-team Technical Leader is responsible for consolidating these forms and/or the entire team submits them to the IBR Coordinator. Keep in mind that the CAM Discussion Assessment Form can be tailored based on risk. See **Appendix F**

Findings/Action Items: A Finding is a significant deficiency or new risk that warrants documentation and corrective action with factual evidence. Any new risks need to be added to the risk register (e.g., poor schedule health check results, missing scope, inadequate BOE, risks not quantified, staffing issues, improper PMTs, etc.), and should be logged and categorized by the risk areas and/or a general finding. See **Appendix I** for log template. *Note: the IBR Log is expected to be submitted to the NASA EVM PE for incorporation into the Agency IBR Findings database.* Findings should be submitted immediately to the IBR Coordinator via the CAM Discussion Assessment Form. A supplier response or plan should be provided to the IBR Team as shortly after an IBR event, and then worked until closure. However, if 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 resolved quickly (e.g., additional documentation request, complete schedule coding, schedule a follow-on discussion, inadvertently labeling a WP/PP LOE instead of a proper PMT, missed status on one work package, 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, technical, schedule, cost, resources, or management processes and assigned a rating based on risk evaluation criteria. The goal of the risk assessment area of an 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 an IBR. IBRs are not pass/fail events and rating the overall IBR or CAM discussions is not appropriate.

All findings/action items should be captured in the IBR Log, with appropriate detail, owners, completion dates, status, etc. Ensure adequate detail in the Finding description to fully understand the deficiency and impact to the project. It is also needed to risk rate the IBR risk areas during the Out Brief prep. Therefore, it is critical that enough time is allotted for a caucus after each CAM Discussion, and each team member completes the CAM Discussion Assessment Form. The IBR Log will support the Letter of Findings during the IBR Close-Out Phase. See **Appendix I**.

4.4 Out briefs

4.4.1 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. Ensure adequate time is allotted at the end of each day. It is optional at the end of the daily IBR Team caucus to invite the Supplier project to hear the potential Findings. The IBR Team needs to discuss first prior to this, so concerns can be properly aired. This is not a time to resolve or debate potential Findings.

4.4.2 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 an 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 for the out brief.

The Team Leader should out brief the supplier at the end of an on-site IBR. The out brief should be tailored for each Supplier project. However, several areas should be included: Summary assessment w/ risk evaluation criteria for each IBR risk area; detailed assessments by each IBR risk areas (technical, schedule, cost, resources, management processes) on a separate chart; include preliminary findings and action items; next Steps (path forward) with dates; the Team Leader should assess whether a follow-on IBR will be required. This decision is based on the Team Leader's assessment of whether the objectives of an IBR have been achieved. Again, 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 based on direction from the Team Leader.

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. The Team reserves the right to continue to review the Findings and Action Items after an IBR, for further clarification and consolidation as well as conducting any follow-up CAM Discussions.

5.0 MONITORING

5.1 General

Once an on-site IBR is completed, a formal review of all Findings and Action Items identified during an IBR will be done for possible consolidation and clarification (approximately 10 workdays). The supplier will be given a timeframe to respond with a "plan" to address the Findings and Action Items (approximately 20-30 workdays). The customer and supplier should agree on the plan and identify individuals responsible for all identified Findings and Action Items. This phase also includes capturing lessons learned from the IBR process. The purpose of the 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 an IBR out brief. Findings and Action Items are worked to closure during their monthly project management reviews.

5.2 Reporting IBR Results

The results of an 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, an 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 IBR findings/actions are out of scope.

The purpose of the letter or report is to summarize all the findings documented during 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, **Appendix K** contains the IBR Report template and **Appendix M** contains a sample out brief template. The IBR Findings Log is an attachment 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 an 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 an IBR.

5.3 Tracking Findings

Tracking the progress in resolving each finding/action item 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 findings/action items are dispositioned. Regular project reviews are the venue to status findings/action items. IBR Action Items/Findings should not be assigned to other reviews or go outside the scope of an IBR (e.g., not used to solve systemic agency issues). Approval of corrective actions rests with the Team Leader, and most likely will be an iterative process.

5.4 Lessons Learned

After an 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 PE or Deputy PE and organizational EVM Focal Point members. *In addition, a final IBR Findings log will be forwarded for inclusion in the Agency's IBR Findings database.*

Table 3 Lessons Learned

Item	Description
Follow Policy	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.
Perform Joint Training	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 IBR goals and clear expectations
Plan for the CAM Discussion	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). Consider having a dedicated scribe which would allow the team member asking the question to actively engage and not be distracted with note taking. This will ensure that team members understand roles and responsibilities during the CAM discussions.
Follow the 85% Rule	Ensure CAM discussions focus on 85% of the total budget including the high-dollar, high-risk, CAs on the critical path. If time allows review at least one LOE and one material CA.
Do Homework	Ensure the IBR Team does their homework and has reviewed data specific to their areas prior to an on-site IBR. More structured questions will help to satisfy their understanding of the data and may also highlight issues before an on-site IBR. Ensure team members are qualified in one or more of the risk areas: Technical, Cost, Schedule, Resources and Management Processes.
Out brief Daily	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 the event discussion without the Supplier present is needed, and then invite them in.

Item	Description
Enforce Daily Schedule	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 and ensures that the whole team is aware of the information. This of course depends on the CAs to be reviewed during a CAM discussion. If a CAM has multiple CAs, 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.
Enforce CAM Availability	Reconfirm CAM availability prior to an 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 an IBR. The Supplier should not notify the IBR Team at the last minute that a major CAM is unavailable and offer a substitute CA that is not of equal importance.
Limit Attendance	Limit the number of participants in the CAM discussion. Experience has shown that CAMs are reluctant to share the real story of their CAs with many people in the room. Recommendation is to always hold a small group. Observers should be kept at a minimum.
Ensure Periodicity	Ensure that all data has a consistent data date or status date (e.g., IPMR, IPMDAR, IMS).
Ensure Expectations	Ensure clear expectations with customers Supplier on what data will be required up-front, roles and responsibilities, how an on-site IBR will be conducted, and what is expected after the review.
Ensure Timely Data Submission	Ensure data is submitted prior to an 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 an IBR.
Ensure Logistics	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). 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. Avoid distractions (cell phones, other conversations, conference rooms not reserved for the whole time, etc.).

Item	Description
Calculate IBR Duration Based on Dollarized RAM	Ensure the length of an 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 an 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 CAs needs to be agreed upon by the Project Manager and the NASA EVM Program Executive.
Target CAM Questions to CAMS	Ensure CAMs answer questions, instead of their support personnel. Support personnel may assist, but CAMs need to understand data and be able to navigate the data traces.
Show Evidence	Ensure CAM discussions are “show me” versus “tell me”.
Use Out-brief Template	The IBR Out brief should consist of a reiteration of the intent of an 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
Only color code risk as per 5 categories	Ensure the overall IBR, CAMs, etc. are not graded (or color coded) because an IBR is not a pass/fail event and subject to grading. Of course, the five risk areas are scored by the color coding representing high/medium/low based on the objective evaluation criteria. These are the only appropriate color-coding ratings.
Use Mock Discussions	Conduct a mock CAM discussion prior to on-site review, if time permits.
Do Not Allow PM to Dictate Attending Every Discussion	PMs can intimidate the CAMs during the discussion, with or without intention. It is optimal to host the CAM Discussion without the PM. Further, it prevents the use of concurrent CAM discussion sessions using multiple IBR teams, a recommended practice.
Demonstrate a Data Trace	Early on during the IBR preparation and to augment the training, it is recommended that the IBR Coordinator/ Facilitator demonstrate how to perform a data trace using the artifacts provided by the project and share with the IBR team. This ensures team members are well prepared to performed data traces themselves.
Use of Concurrent IBR Teams	The IBR team should be divided into sub-teams to allow for CAM Discussions to be performed in parallel. This allows to shorten the overall schedule and allow for caucus after each the discussion session.

6.0 CLOSEOUT

6.1 IBR Closeout Letter

The Team Leader will approve the close out of an IBR once all findings/actions items have been dispositioned. It should be noted that IBR findings do not belong nor are to be moved to EVMS Surveillance reviews. An IBR closeout letter is sent to the Supplier indicating that all findings are closed, and the IBR process is complete. Reporting the results of an IBR may take the form of an informal letter, email, or memo for record, depending on the size and formality of an IBR. See **Appendix L** for an IBR Close-out Letter template.

6.2 Documentation Storage

At the conclusion of an IBR, the related artifacts should be consolidated in a single folder and archived for future reference.

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 budget/resource plan, and management processes. Discussions will focus on the scope of work, work authorization, scheduling, budget, 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, teamwork 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>.

_____

<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 (to the letter in Appendix A)

#	Artifact	Special Instructions
1	RAM $	Dollarized-Responsibility Assignment Matrix ($RAM) – Primary data artifact to begin IBR planning (preferred format Excel)
2	WBS*	Contract Work Breakdown Structure (CWBS), CWBS Dictionary (WBS In-house). Only if changed since formal submittal. Must meet content requirements identified within the DRD. SOW Para Identification
3	OBS	Organizational Breakdown Structure (OBS) at control account level
4	SOW	Statement of Work (SOW), or Project Plan including major deliverables (In-house)
5	Project Plan	Including the EVM Implementation Plan, if available
6	Supplier List	Supplier/subcontractor List (include type, supplier, contract value, flow down requirements)
7	WAD	Work Authorization Documents (WADs) or equivalent
8	CAP	Time-phased, resource loaded Control Account Plans (CAPs). (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 with time-phased budget (BCWS) and forecast (ETC). In addition, include performance (BCWP) and actual costs (ACWP), if available. Native file format required, (preferred format Excel)
9	BOE	Basis of Estimates (BOEs) (Include WBS, tasking, labor categories for time-phased budget with justification, material BOM, assumptions/ constraints, estimating method (e.g., analogy, bottoms up, parametric) and risks at CA level)
10	Performance reporting (if available) *	Integrated Program Management Report (IPMR)* or Integrated Program Management Data Analysis Report (IPMDAR)* data sets, and/or project performance reports/monthlies (include latest Estimate at Completion (EAC) with supporting documentation)
11	Staffing	Staffing Plans/charts
12	IMS*	Integrated Master Schedule (IMS)* in native file format w/ proper coding (e.g., CA, WP, PP, PMT, SVT, Margin, etc.). Include any detailed schedules and summary schedule (one pager)
13	Schedule Data	Schedule data dictionary, critical path(s) reports, Schedule Risk Assessment (SRA), other schedule metrics including health checks, Basis of Schedule (BOS)
14	Risk List	Risk Register with quantified cost/schedule impacts and mitigation plans, any opportunities
15	Material List	Critical Materials List, and High/low dollar threshold
16	Logs	Baseline Control Logs (Baseline Change Request, Management Reserve, Undistributed Budget, Schedule Reserve, etc.)

** Data Requirements Description (DRD)*

Supplemental Data

#	Artifact	Special Instructions
1	SDD*	Supplier EVM System Description Document*, or NASA In-house Project's EVM Implementation Plan
2	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
3	Latest Estimate at Completion	Including supporting documentation
4	NASA form 533 M/Q*	If applicable
5	Staffing	Staffing Plans/charts

* *Data Requirements Description (DRD)*

APPENDIX B: Sample IBR Checklist

Checklist Items	Target Date	Done	Responsibility	Comments
Organizing & Planning				
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 for analysis and data traces			Coordinator	
Determine supplier IBR readiness			Team Lead	
Prepare & Train for an IBR				
Conduct pre-IBR meeting			Team Lead	
Provide Joint IBR training (EVM Overview for government team if necessary)			Facilitator	
Coordinate logistics with team/supplier			Coordinator	
Finalize IBR agenda			Team Lead/Coordinator	
Determine specific CAM discussion questions			Sub-team Leads	
On-site IBR Activities				
Present IBR In-brief			Team Lead	
Conduct CAM Discussions and PM meetings			Sub-team Leads	
Hold daily team status meetings to discuss findings/action items			Team Lead	
Request additional data, as required			Coordinator	
Complete CAM Discussion Assessment Form			Sub-team Leads	
Prepare/present IBR Out brief			Team Lead	
Follow-up Activities				
Formally notify supplier of IBR Findings/Action Items			COR	
Document lessons learned			Team Lead	
Monitor Findings and action items to closure			Team Lead	
Notify supplier of IBR closure			COR	

APPENDIX C: Example Dollarized Responsibility Assignment Matrix (RAM)

Sum of BAC	ObsNum										
WBS	PM0001	SE0001	SMA001	SCI001	SUB001	SUB002	SUB003	OPS001	MOP001	I&T001	Grand Total
000000.05.01					$13,419,830						$13,419,830
000000.05.02						$11,361,247					$11,361,247
000000.06							$64,673,432				$64,673,432
000000.01	$6,824,481										$6,824,481
000000.02		$3,882,274									$3,882,274
000000.03			$1,098,479								$1,098,479
000000.04				$10,454,749							$10,454,749
000000.07								$22,722,495			$22,722,495
000000.08									$11,813,545		$11,813,545
000000.09										$10,691,138	$10,691,138
Grand Total	**$6,824,481**	**$3,882,274**	**$1,098,479**	**$10,454,749**	**$13,419,830**	**$11,361,247**	**$64,673,432**	**$22,722,495**	**$11,813,545**	**$10,691,138**	**$156,941,670**

APPENDIX D: Sample Agenda

IBR Day 1 Agenda: [Date]

Time	Bldg/Room	Activity	Attendance	Responsibility	
7:30 – 8:00	HQ/Main Conference	Assembly	All	IBR Coordinator	
8:00 – 8:15	HQ/Main Conference	In Brief: Welcome/Introductions, IBR Objectives, Agenda	All	Gov. PM (Review Leader)	
8:15 – 10:00	HQ/Main Conference	In Brief: Project Overview, EVM Process, Monthly Business Rhythm	All	Contractor PM/Business Team	
10:00 – 11:45	200/1234	CAM Discussion 1: 05.01.01, Fuselage	Contractor Team, Gov. IBR Team A	CAM:	Gov CAM:
11:45 – 12:00	200/1234	CAM Discussion 1: Team Caucus	Gov. IBR Team A	NA	Gov CAM:
10:00 – 11:45	300/5678	CAM Discussion 2: 05.02.01, Cockpit Systems	Contractor Team, Gov IBR Team B	CAM:	Gov CAM:
11:45 – 12:00	300/5678	CAM Discussion 2: Team Caucus	Gov IBR Team B	NA	Gov CAM:
12:00 – 1:00		Lunch	All	IBR Coordinator	
1:00 – 2:45	200/1234	CAM Discussion 3: 05.03.01, Landing Gear	Contractor Team, Gov IBR Team A	CAM:	Gov CAM:
2:45 – 3:00	200/1234	CAM Discussion 3: Team Caucus	Gov IBR Team A	NA	Gov CAM:
1:00 – 2:45	300/5678	CAM Discussion 4: 05.04.01, Wings	Contractor Team, Gov IBR Team B	CAM:	Gov CAM:
2:45 – 3:00	300/5678	CAM Discussion 4 Team Caucus	Gov IBR Team B	NA	Gov CAM:
3:00 – 4:45	200/1234	CAM Discussion 5: 05.05.01, Empennage	Contractor Team, Gov IBR Team A	CAM:	Gov CAM:
4:45 – 5:00	200/1234	CAM Discussion 5: Team Caucus	Gov IBR Team A	NA	Gov CAM:
3:00 – 4:45	300/5678	CAM Discussion 6: 04.01.01, Systems Engineering	Contractor Team, Gov IBR Team B	CAM:	Gov CAM:
4:45 – 5:00	300/5678	CAM Discussion 6: Team Caucus	Gov IBR Team B	NA	Gov CAM:
5:00 – 5:30	HQ/Main Conference	Daily Caucus	All	Gov. PM (Review Leader)	

IBR Day 2 Agenda: [Date]

Time	Bldg/Room	Activity	Attendance	Responsibility	
7:30 – 8:00	HQ/Main Conference	Assembly	All	IBR Coordinator	
8:00 – 9:45	200/1234	CAM Discussion 7: 05.06.01, Nacelle	Contractor Team, Gov. IBR Team A	CAM:	Gov CAM:
9:45 – 10:00	200/1234	CAM Discussion 7: Team Caucus	Gov. IBR Team A	NA	Gov CAM:
8:00 – 9:45	300/5678	CAM Discussion 8: 05.07.01, Alternate Power Unit (APU)	Contractor Team, Gov IBR Team B	CAM:	Gov CAM:
9:45 – 10:00	300/5678	CAM Discussion 8: Team Caucus	Gov IBR Team B	NA	Gov CAM:
10:00 – 11:45	200/1234	CAM Discussion 9: 05.08.01, Avionics	Contractor Team, Gov. IBR Team A	CAM:	Gov CAM:
11:45 – 12:00	200/1234	CAM Discussion 9: Team Caucus	Gov. IBR Team A	NA	Gov CAM:
10:00 – 11:45	300/5678	CAM Discussion 10: 05.09.01, Environmental Control System (ECS)	Contractor Team, Gov IBR Team B	CAM:	Gov CAM:
11:45 – 12:00	300/5678	CAM Discussion 10: Team Caucus	Gov IBR Team B	NA	Gov CAM:
12:00 – 1:00		Lunch	All	IBR Coordinator	
1:00 – 2:45	200/1234	CAM Discussion 11: 05.10.01, Electrical	Contractor Team, Gov IBR Team A	CAM:	Gov CAM:
2:45 – 3:00	200/1234	CAM Discussion 11: Team Caucus Only	Gov IBR Team A	NA	Gov CAM:
1:00 – 2:45	300/5678	CAM Discussion 12: 05.11.01, Hydraulics	Contractor Team, Gov IBR Team B	CAM:	Gov CAM:
2:45 – 3:00	300/5678	CAM Discussion 12 Team Caucus	Gov IBR Team B	NA	Gov CAM:
3:00 – 4:45	200/1234	CAM Discussion 13: 05.12.01, Powerplant	Contractor Team, Gov IBR Team A	CAM:	Gov CAM:
4:45 – 5:00	200/1234	CAM Discussion 13: Team Caucus	Gov IBR Team A	NA	Gov CAM:
3:00 – 4:45	300/5678	CAM Discussion 14: 01.01.01, Project Management	Contractor Team, Gov IBR Team B	CAM:	Gov CAM:
4:45 – 5:00	300/5678	CAM Discussion 14: Team Caucus	Gov IBR Team B	NA	Gov CAM:
5:00 – 5:30	HQ/Main Conference	Daily Caucus	All	Gov PM (Review Leader)	

IBR Day 3 Agenda: [Date]

Time	Bldg/Room	Activity	Attendance	Responsibility	
7:30 – 8:00	HQ/Main Conference	Assembly	All	IBR Coordinator	
8:00 – 9:45	200/1234	CAM Discussion 15: 05.13.01, Software	Contractor Team, Gov. IBR Team A	CAM:	Gov CAM:
9:45 – 10:00	200/1234	CAM Discussion 15: Team Caucus	Gov. IBR Team A	NA	Gov CAM:
8:00 – 9:45	300/5678	CAM Discussion 16: 06.01.01, Ground Support	Contractor Team, Gov IBR Team B	CAM:	Gov CAM:
9:45 – 10:00	300/5678	CAM Discussion 16: Team Caucus	Gov IBR Team B	NA	Gov CAM:
10:00 – 12:00	HQ/Main Conference	Out Brief prep, complete IBR Log, risk rate IBR Areas (Technical, Schedule, Cost, Resources, Management Processes)	Gov Only	Gov PM (Review Leader)	
12:00 – 1:00		Lunch	All	IBR Coordinator	
1:00 – 1:30	HQ/Main Conference	Out Brief (Acknowledgements, Preliminary Findings, Action items, Next Steps	All	Gov PM (Review Leader)	
1:30		Adjourn			

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 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, most of the IBR Team questions should come from the results of their data review prior to the IBR meetings.

#	Question	Risk Area
1	Can you provide an OBS Dictionary or Chart?	Resource
2	Can you provide the RBS (Resource Breakdown Structure) Dictionary or Chart?	Resource
3	What is your scope? (The CAM should be able to refer to a SOW paragraph, a WBS, or WBS narrative, WBS Dictionary and a WAD.)	Technical
4	What are your schedule responsibilities?	Schedule
5	How did you plan the work into CAs? (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.)	Technical
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 WPs, planning packages, or summary level planning packages and the budgets and ETCs associated with each. The sum of the WPs and planning packages should equal the CA budget. The actual costs plus the ETCs should equal the EAC.)	Technical
7	Show me your WADs 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.	Technical
8	Reconcile the complete WBS to the schedule. (This should be done prior to on-site review)	Technical
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?	Technical
10	What role did you play in formulating the budget?	Cost
11	How did you arrive at your budget figures? Do you have the backup or worksheets from which you arrived at your estimates?	Cost
12	Was there a negotiation process for your budgets? Is your budget adequate?	Cost
13	What is your total budget? (For each subcontract and the corresponding CAs). How is profit or fee included in your budget?	Cost
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).	Management
15	How many CAs are you responsible for and what is the total dollar value of your accounts? Show me a (CAP).	Management
16	How are your budgets time-phased, and is this reflected in your Control Account Plan?	Management
17	Does it reflect an achievable value for the resources to fully accomplish the CA scope of effort?	Management

#	Question	Risk Area
18	How many people work for you and what do they do?	Resource
19	How do they report to you? How do you know the performance status of their work?	Resource
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.)	Resource
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?	Resource
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?	Resource
23	To the level of detail your schedule is resource loaded, how do you reconcile changes to resource allocation?	Resource
24	Has the schedule been resource leveled?	Resource
25	Are the maximum units per resource accurately identified?	Resource
26	What comparison has been done between the resources required as tasks are currently scheduled and the resources available during the same time frames?	Resource
27	If there are tasks in the schedule that do not have resources assigned, how are you addressing this in your EVMS?	Resource
28	Are the time phased budget resources consistent with your IMS? (Show the trace from your CA to intermediate or master schedules.)	Resource
29	Is all your scope of work detail planned?	Multi
30	What rationale was used to time phase the budget into planning packages, tasks, WPs or summary activities?	Cost
31	What is the procedure and time frame for developing WPs from the planning packages?	Management
32	Are your planning packages time-phased?	Management
33	Do you have any LOE accounts? Describe the tasks of these accounts.	Management
34	Do you have any CAs that contain a mixture of LOE and discrete effort? What is the highest percentage of LOE within an account that also contains discrete effort?	Management
35	What percent of your work is measured or discrete effort? What percent is LOE?	Management
36	Is the time-phased budget related to planned activities of the WP?	Management
37	Who prepares the budgets for your WPs?	Management
38	Does anyone review labor hours charged to your WPs?	Management
39	Do you ever have mischarges to your WPs? How are these corrected?	Management
40	Have you had retroactive changes and/or re-planning efforts to the budget baseline?	Cost
41	[Choose a CA to be the example CA]: What is your total budget amount? Of this total budget amount, how much is distributed to WPs and how	Cost

#	Question	Risk Area
	much is retained in planning packages? Do you have an UB or MR reserve account?	
42	How was the budget time-phased for each WP? (i.e., what was the basis for the spread?)	Cost
43	How are material budgets planned? How do you track material prior to delivery? How do you track material when deliveries are late?	Cost
44	How are you authorized to begin work? (Provide an example of work authorization documentation.)	Management
45	Have you ever opened WPs earlier than the scheduled start date? If so, how is this accomplished?	Management
46	What document authorizes you to begin work on a subcontract?	Management
47	How do you open a CA?	Management
48	How do you close a CA?	Management
49	How can you tell when a CA is opened or closed?	Management
50	How were/are you advised of budget, tasks, and schedule changes?	Management
51	How do you status your accounts? How does the performance status of your accounts get into the system?	Management
52	Have you had any changes to your accounts? (Provide an example of how these are handled.)	Management
53	Are budget transfers between your accounts and MR and undistributed budget traceable? How?	Management
54	Do you have any work originally planned for In-house that was off-loaded subcontracted out? How was this accomplished? (Make vs. Buy)	Management
55	For off-loaded work that has been contracted out, was the budget transferred directly, returned to MR, or to UB?	Management
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.	Management
57	Has your effort been impacted by any directed or contractual change?	Management
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)?	Management
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]	Management
60	Did you re-phase or re-plan work? In process work? Completed work? Unopened WPs? Make current period or retroactive changes? If so, how was this accomplished?	Management
61	Did you transfer budget between CAs?	Management
62	How have contract changes or other changes been incorporated into the CA?	Management
63	If one of the CAs had an unfavorable cost or schedule variance, did you re-plan or request MR to reduce or eliminate the variance?	Management

#	Question	Risk Area
64	What formal training have you had in EVM?	Management
65	Do you feel you have had adequate training, or do you need more?	Management
66	What type(s) of PMTs (or EVT) indicators have been assigned by you?	Management
67	Is the PMT chosen appropriate for the type of work being performed?	Management
68	If the Percent Complete PMT is used, show us how you take status. (Quantifiable Back-up Data (QBDs) to support that percentage).	Management
69	Does the earned value assessment correlate with technical achievement?	Management
70	Do you use interim milestones on any of your WPs to measure Budgeted Cost for Work Performed (BCWP)?	Management
71	What options does your management system provide for taking BCWP? Do your (CAP)s indicate the method used in taking BCWP?	Management
72	Demonstrate how you earn BCWP in the same way that Budgeted Cost for Work Scheduled (BCWS) was planned?	Management
73	Can you provide examples of how you measure BCWP or earned value for work-in-process?	Management
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?	Management
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.)	Management
76	What reports do you receive that give you cost and schedule progress of your CAs?	All
77	Are you responsible for any subcontracts? If so, what are they? How do you monitor performance on these? How do you take BCWP?	Management
78	How are subcontracts managed? (Ask the Subcontracts Manager to describe the process for managing subcontractor earned value.)	Management
79	What subcontractor technical, schedule and cost reports are required to be submitted to you or your team?	Management
80	How do you check the status and performance of work on your CA by a subcontractor? How are actual costs recorded against your CA?	Management
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?	Management
82	What is specifically needed by you from other CAMs to generate subcontractor outputs or products? How do you monitor its progress?	Management
83	When is BCWP taken on material? How much BCWP is earned when material is withdrawn from inventory or received?	Management
84	Will an account accept BCWP or Actual Cost of Work Performed (ACWP) if there is no BCWS?	Management
85	Identify risks/opportunities that are included/not included in the baseline.	Management
86	What are the major risks or challenges remaining to accomplish the CAM's or subcontractor's responsibilities?	Management

#	Question	Risk Area
87	Ask the CAM to describe why it is a risk or opportunity.	Management
88	Exchange ideas about risks or opportunities.	Management
89	Establish the likelihood of the risk/opportunity event.	Management
90	Ask the CAM to explain the risk mitigation plan emphasizing risk mitigation milestones and associated risk performance measurement.	Management
91	Determine the impact (cost/schedule) for medium and high risks.	Management
92	Ask the CAM to consider extreme values for the effort (optimistic/pessimistic).	Management
93	Document results of the Risk Assessment Form.	Management
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?	Management
95	How and when is risk assessment or risk management plan updated for technical/schedule/cost risk items affecting your CA?	Management
96	How does the EAC compare to the Budget at Completion (BAC)? (Note: The ETC should be reviewed monthly by the CAM.)	Cost
97	What is an EAC?	Cost
98	Have you updated your EAC?	Cost
99	What is your current EAC and how was the EAC developed?	Cost
100	How often do you update your EAC?	Cost
101	Have you done a Comprehensive EAC? If not, do you know when the next comprehensive EAC will be done? If so, When?	Cost
102	What guidance or instructions did you receive from management in order to develop your EAC?	Cost
103	If written instructions were provided, what were these and who authored them?	Cost
104	Who reviews updates to the EAC?	Cost
105	Discuss your management's involvement in developing the estimate of the cost remaining to complete your program tasks.	Cost
106	Can you outline the steps you took to arrive at your estimate? [Choose a CA to demonstrate/validate CAM understanding and adherence to process]	Cost
107	How did you determine the effort or resource amounts required to complete the remaining work?	Cost
108	Demonstrate that your EAC is segregated by labor, material, and other direct charge categories.	Cost
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.	Cost
110	Explain how EAC's are calculated for material?	Cost
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.)	Cost

#	Question	Risk Area
112	Did you consider the current cost performance trend (TCPI vs CPI)? What performance level was assumed and why?	Cost
113	How does the projected performance level compare to your experienced level of performance?	Cost
114	Describe and demonstrate how you projected the cost to complete over the time remaining.	Cost
115	Does the EAC require PM approval?	Cost
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.)	Cost
117	Are variance analysis thresholds or requirements established for reporting technical, schedule or cost variances to planned goals established for your CAs? Do you informally/formally report the cause of variance, impact or corrective action for these variances?	Management
118	Do you have any variance thresholds on your CAs? If so, what are they?	Management
119	How do you know when you have exceeded a threshold?	Management
120	How do rate changes affect your CAs?	Management
121	How do you know when you must prepare a variance report?	Management
122	Do you have samples of any variance analysis reports?	Management
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]	All
124	How do you determine whether the reported cost variance is due to usage or rates? Subcontractor effort or a company overhead rate?	Management
125	Who is responsible for rate variance analysis?	Management
126	Does your variance analysis show a statement of problem, the variance, cause, impact and proposed corrective action?	Management
127	Who receives your variance reports?	Management
128	What action is taken on the reports?	Management
129	Which reports do you use most frequently? Why?	Management
130	Have you ever found errors in the data? How are data anomalies identified and corrected?	Management
131	Provide the methodology that illustrates the schedule development and integration with the EVMS.	Schedule
132	What sources of data or information are used in the development of your schedule?	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.)	Schedule
134	Is the schedule data grouped and organized logically?	Schedule
135	How is it determined which activities are tied together with logic?	Schedule
136	Discuss Schedule interfaces and constraints.	Schedule
137	How does your WP relate to the CWBS or WBS? Discuss with actual examples.	Technical

#	Question	Risk Area
138	What is the difference between a WP and a planning package?	Schedule
139	How is the Earned Value Technique determined? Is it easily identified in the schedule?	Schedule
140	Describe your method of determining task durations.	Schedule
141	Do you directly support any major master or intermediate schedule milestones? Do you have detailed schedules below the WP? How do detailed schedules below the WP support the WP schedules?	Schedule
142	Are the OBS, RBS and WBS horizontally (identified) within the schedule?	Schedule
143	If applicable, how are subcontractor(s) schedules developed and integrated into the master project schedule?	Schedule
144	Is the status date accurately reflected in your schedule(s)?	Schedule
145	When was the last official schedule baseline established?	Schedule
146	How do you know that the work within your CAs to be performed by subcontractor has been properly planned?	Schedule
147	Are there additional coding schemes not addressed above? If so, describe the nature and intent of these schema.	Schedule
148	Have you considered risks in developing the plan? Are they incorporated into the schedule? Are they easily identified in the schedule?	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).	Schedule
150	Discuss Schedule impacts related to other work/organizations.	Schedule
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 CA?	Schedule
152	Do you have schedule margin? If so, how is it used? Do you use funded schedule margin? Explain the use.	Schedule
153	How do you know the schedule is structured correctly to report accurate critical paths? Show health check and other metrics.	Schedule
154	How do you determine your critical path(s)?	Schedule
155	How do you use the critical path?	Schedule
156	Provide a critical path analysis for the project.	Schedule
157	Is the critical path realistic?	Schedule
158	Does the critical path contain LOE tasks?	Schedule
159	Has a schedule risk assessment been performed? When was the last assessment performed?	Schedule
160	How often do you perform a schedule risk assessment and at what level of detail?	Schedule
161	Who is involved in developing schedule risk assessments?	Schedule
162	What method(s) are used in developing your schedule risk assessment?	Schedule
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.	Schedule

#	Question	Risk Area
164	What tasks in your schedule are pacing or being paced? Describe your method of pacing control.	Schedule
165	Are there external project dependences in the schedule? How are external project dependencies identified and monitored?	Schedule
166	How are your WP activities related to the IMS or underlying intermediate supporting schedules? Actual examples will support this discussion.	Schedule
167	How often do you give the update of the schedule to your customer?	Schedule
168	Discuss the relationships of WPs to milestones.	Schedule
169	Discuss Resource levels to support schedule milestones.	Schedule
170	Discuss Relationships to other organizations.	Schedule
171	What schedule milestones did you use in planning the CAs? (Ask the CAM to show the team the schedule milestones used in planning the CAs.)	Management
172	Select a WP at random. Trace the WP through CA and the schedule. Verify cost and schedule vertical and horizontal integration.	Management
173	Define how data flows from the schedule into the EVMS.	Management
174	Define the EVM indicators used on this project and state their current values (e.g. CV, SV, CPI, and SPI).	Management
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?	Management
176	Elaborate on your schedule management and change control techniques.	Management
177	Reconcile the EVMS BCWP with the percent complete in the schedule.	Management
178	What is your current schedule variance from the approved baseline?	Management
179	How are updates and changes to the schedule reconciled in the EVMS?	Management
180	How are you informed by other organizations of changes in their output that may affect your CA schedules? (Horizontal Trace)	Management
181	Demonstrate that the progress reflected on the master project schedule or underlying intermediate schedules correlates to the relative progress reflected in the EVMS	Management

APPENDIX F: CAM Discussion Assessment Form

IBR Team: [e.g., Team A, etc. if multiple teams]
Team Member: [name]
Team Member Role: [area of expertise, e.g., Technical, EVM Analyst, Scheduler, etc.]
Date: [Insert date]

Project: [insert project name]
WBS/Control Account(s): [insert number & name, e.g., 05.01.02 Mechanical]
CAM: [name]
Support Staff: [name (Scheduler), name (Business Office), etc.]
Total Value: [insert value, e.g., $1.19K]
Work Type %: [insert percentages, e.g., 70% Discrete, 20% LOE, 10% Apportioned]

GENERAL (~10-15mins)

Brief Introductions. CAM to provide a brief overview of the Control Account(s). Where do you fall within the organization? (Show org chart), what is your responsibility? (Show WAD) what is the dollar value of your control account(s)? (Show WAD, CAP, etc.), What CAM and EVM training have they had? (Show evidence, certificate, email, etc.).

IBR RISK AREAS (~1.5hrs)

Conduct a Technical, Schedule, Cost, Resources, Management Processes traces. CAM Discussions are a demonstration (show and tell) of the products associated with the management of their control account(s). Avoid technical discussions, getting too detailed (off in the weeds), tangents, etc. There is limited time for questions, answers, and demonstrations. Avoid yes/no questions as much as possible. Document preliminary Findings. Use the risk evaluation criteria in the NASA IBR Handbook to rate the five IBR risk areas.

1. **TECHNICAL RISK:** The ability of the project's technical plan to achieve the objectives of the scope of work and key performance parameters-based thoroughness of the plan. Technical risks include the effects of available technology, software development capability, design maturity, etc.

   OVERALL EVALUATION: *Ideally all parties will mutually agree that all scope is accounted for, adequate definition, authorized, responsibility properly allocated with performing org, consistent with the SOW/Project Plan, contract requirements, discrete work/products, etc.* ***The below questions for Evaluation Factors are your assessment that support the overall question: Are key performance parameters adequate? If no or unknown, there is likely risk and findings should be documented.***

Technical Risk Evaluation Factors	Yes/No/Unk	Comments (Identify Risks/Opportunities)
1. Does the plan cover all effort within the SOW/Project Plan?		
2. Is the plan consistent with requirements?		

Technical Risk Evaluation Factors	Yes/No/Unk	Comments (Identify Risks/Opportunities)
3. Is there adequate definition and identification of tasks in the baseline?		
4. Is work scope responsibility properly allocated to the performing organization that controls budget and schedule?		
5. Does the plan consider the effects of available technology, software development capability, human systems design options, design maturity, rework, etc.?		

PRE-ACTIVITY: *Conduct technical traces (pre-activity) and preliminary analysis / CAM Demonstrations (e.g., SOW/Project Plan -> WBS -> WBS Dictionary -> TPMs -> CAPs, etc.)*

Q1: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:
Q2: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:
Q3: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:

POTENTIAL FINDINGS (Risk Rated): *Findings are serious deficiencies or discrepancies that pose additional risk and require formal notification/disposition. Any new risks approved should be added and tracked in the supplier's/In-house project's Risk Register.*

Technical Risk Short Description	Detailed Description	High/ Medium/ Low
Example: Missing Scope	*Spare flight unit, per SOW, is missing in the WBS Dictionary, however, it is in the IMS and an adequate BOE exists.*	*Low*

POTENTIAL ACTION ITEMS: *Action Items are typically minor, typically closed quickly, and are not as serious as findings (risks).*

1. *Example: Document Request for revised WBS Dictionary*
2. [insert action item]
3. [insert action item]

2. **SCHEDULE RISK:** The adequacy of the time allocated for performing the defined tasks to successfully achieve the project schedule objectives. Schedule risks include 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(s).

OVERALL EVALUATION: *Ideally all parties will mutually agree that baseline schedule(s) is mechanically sound (health check), realistic, has adequate detail, includes all technical scope/objectives, etc.* ***The below questions for Evaluation Factors are your assessment that support the overall question: Are key performance parameters adequate? If no or unknown, there is likely risk and findings should be documented.***

Schedule Risk Evaluation Factors	Yes/No/Unk	Comments (Identify Risks/ Opportunities)
1. Is the time allocated for performing defined tasks adequate to successfully achieve project objectives?		
2. Is all required contract work scope represented in the baseline schedule?		
3. Is the sequence of work logical?		
4. Do discrete task interdependencies, including major critical subcontractors, clearly identify the critical path to completion and critical paths to all major milestones?		
5. Is the scheduling methodology sound (based on Schedule Health Check)?		

PRE-ACTIVITY: *Conduct schedule traces (pre-activity)/CAM Demonstration (IMS -> any detailed schedules -> critical path(s) -> WAD period of performance -> CAPs -> other reports/analysis, etc.)*

Q1: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:
Q2: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:
Q3: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:

POTENTIAL FINDINGS (Risk Rated): *Findings are serious deficiencies or discrepancies that pose additional risk and requires formal notification/disposition. Any new risks approved should be added and tracked in the Supplier project's Risk Register.*

Schedule Risk Short Description	Detailed Description	High /Medium /Low
Example: Schedule Integrity Issues	*Schedule integrity (mechanics) issues resulting from poor health check results. e.g., missing logic, excessive leads/lags, out of sequence tasks, tasks not statused, high durations, high float, excessive constraints, etc. (see Acumen Fuse results)*	*Low*

POTENTIAL ACTION ITEMS: *Action Items are typically minor, typically closed quickly, and are not as serious as findings (risks).*

1. e.g., Complete IMS coding of control accounts and work packages
2. [insert action item]
3. [insert action item]

3. **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 risks, which includes the assumptions used for both estimates and resource allocation on the budgets for work items.

OVERALL EVALUATION: *Ideally all parties will mutually agree that the BOE to derive the control account budget (labor, materials, ODC, etc.) with assumptions is sufficient and reasonable to accomplish the work. Budgets are properly resource loaded to demonstrate cost/schedule integration.* ***The below questions for Evaluation Factors are your assessment that support the overall question: Are key performance parameters adequate? If no or unknown, there is likely risk and findings should be documented.***

Cost Risk Evaluation Factors	Yes/ No/ Unk	Comments (Identify Risks/ Opportunities)
1. Is the performance measurement baseline (PMB) derived from a sound BOE using historical data or similar projects?		
2. Has the PMB been adjusted using documented assumptions/complexity factors?		
3. Is PMB time-phasing reasonable and consistent with the schedule baseline dates?		
4. Is the breakout between labor/material/other direct cost assigned reasonable?		

PRE-ACTIVITY: *Conduct budget traces. (BOEs w/assumptions -> WAD -> CAP, budget time-phased in Cobra or another tool, etc.)*

Q1: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:
Q2: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:
Q3: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:

POTENTIAL FINDINGS (Risk Rated): *Findings are serious deficiencies or discrepancies that pose additional risk and requires formal notification/disposition. Any new risks approved should be added and tracked in the Supplier project's Risk Register.*

Cost Risk Short Description	Detailed Description	High/ Medium /Low
Example: Inadequate BOE	*The basis of estimate does not adequately describe how the budget estimate was derived using historical data, heritage hardware, assumptions, limitations, etc.*	High

POTENTIAL ACTION ITEMS: *Action Items are typically minor, typically closed quickly, and are not as serious as findings (risks).*

1. Example Provide missing assumptions that do exist per CAM
2. [insert action item]
3. [insert action item]

4. **RESOURCE RISK:** The availability of personnel, facilities, equipment, materials, etc. when required, to perform the defined tasks needed to execute the program successfully. Resource risks include 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.

OVERALL EVALUATION: *Ideally all parties mutually agree that the Resources (e.g., personnel (labor, skills), facilities, equipment, and materials) to support task planning (staffing profile aligns with tasks, if not resource loaded) within the project schedule are adequate and consistent with BOE/budget.* ***The below questions for Evaluation Factors are your assessment that support the overall question: Are key performance parameters adequate? If no or unknown, there is likely risk and findings should be documented.***

Resource Risk Evaluation Factors	Yes/ No/ Unk	Comments (Identify Risks/Opportunities)
1. Has the CAM planned sufficient personnel (quantity, skill mix) to perform required tasks and are they		

Resource Risk Evaluation Factors	Yes/ No/ Unk	Comments (Identify Risks/Opportunities)
available when needed? Do they align with the schedule?		
2. Has the CAM identified the facilities needed to perform tasks and will they be available when needed?		
3. Has the CAM identified material/equipment needed to perform tasks and will it be available when needed?		
4. Are there risks of competing projects that would limit the availability of resources (people, facilities, equipment, material, etc.)?		

PRE-ACTIVITY: *Conduct resource trace (BOEs -> WAD -> RAM -> staffing -> CAPs, etc.)*

Q1: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:
Q2: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:
Q3: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:

POTENTIAL FINDINGS (Risk Rated): *Findings are serious deficiencies or discrepancies that pose additional risk and requires formal notification/disposition. Any new risks approved should be added and tracked in the Supplier project's Risk Register.*

Resource Risk Short Description	Detailed Description	High/ Medium / Low
Example: Inadequate Staffing	*CAM revealed critical skills (specialty) have not been hired due to inability to recruit as bid in the proposal. Work is not getting accomplished as planned.*	*High*

POTENTIAL ACTION ITEMS: *Action Items are typically minor, typically closed quickly, and are not as serious as findings (risks).*

1. e.g., Provide/confirm testing facility schedule (vibration test)
2. [insert action item]
3. [insert action item]

5. **MANAGEMENT PROCESSES RISK:** The degree to which the management processes provide effective and integrated technical/schedule/cost planning and baseline change control. The risks 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.

OVERALL EVALUATION: *Ideally all parties will mutually agree that processes are in place and implemented to provide timely and accurate performance data. High probability that the work can be completed within the schedule and budget constraints. Management uses performance data to manage and make informed decisions; PMTs used are the most objective and they represent actual performance on the project; risks been identified, and mitigation plans established; MR is adequate; Baseline Change Logs, control; subcontractor management data is integrated; EAC Maintenance, range; CAM training, etc.* ***The below questions for Evaluation Factors are your assessment that support the overall question: Are key performance parameters adequate? If no or unknown, there is likely risk and findings should be documented.***

Management Process Evaluation Factors	Yes/ No/ Unk	Comments (Identify Risks/Opportunities)
1. Is CAM sufficiently trained in business processes, EVM and CAM roles/ responsibilities?		
2. Are EACs updates timely and/or process understood?		
3. Do work packages have appropriate use of performance measurement techniques (PMTs) to objectively status work (e.g., 0/100, 50/50, % complete, apportioned effort, LOE, etc.)?		
4. Are changes to the baseline controlled and documented per the contractor's process, e.g., recent changes, MR request?		
5. Are known risks quantified with cost/schedule impacts and mitigation plans established?		
6. Do variance analysis reports identify the root cause of the issue, the impact and corrective action sufficiently?		
7. Is subcontractor data adequately integrated?		

PRE-ACTIVITY: *Conduct management processes traces. Discuss/demonstrate processes and products following the approved EVM processes, planning, change control, reliable performance data, risk management…*

Q1: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:

Q2: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:
Q3: [insert questions, screen shots (if necessary) from the preliminary traces/data analysis]
CAM Response:

POTENTIAL FINDINGS (Risk Rated): *Findings are serious deficiencies or discrepancies that pose additional risk and requires formal notification/disposition. Any new risks approved should be added and tracked in the Supplier project's Risk Register.*

Mgmt Process Short Description	Detailed Description	High/ Medium/ Low
Example: Risks not Quantified	*Risk Register does include cost/schedule impacts or risks associated with likelihood and consequences. Also, mitigation plans were not provided or demonstrated showing with proper risk step down and ECDs.*	*High*
Example: Improper use of PMTs	*LOE is being used on discrete work packages hindering performance measurement credibility.*	*Medium*

POTENTIAL ACTION ITEMS: *Action Items are typically minor, typically closed quickly, and are not as serious as findings (risks).*

1. e.g., Provide recent BCR Log
2. [insert action item]
3. [insert action item]

CAM DISCUSSION NOTES (~15-30mins):

Due to limited time for CAM Discussions use this section for general notes if not captured above and when other team members are asking questions. IBR Team members should extend the same courtesy while you are asking questions. Discuss each CAM Discussion Form and notes after each CAM Discussion. These will be used by Review Facilitator and Team Leader at end of day joint caucus and to develop Out Brief.

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

An 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.

Table H-1: Risk Evaluation Criteria

Risk Grouping	Description
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.

Ensure known risks for Control Account(s) been quantified (cost/schedule impacts) and determine any new risks from IBR and track in risk register. In addition, ask these questions:

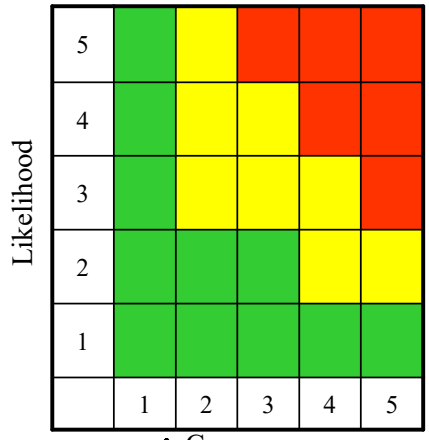
- Are known risks incorporated in the schedule?
- Is there budget or schedule activities (Adequate MR and schedule margin) to support risk mitigation?
- Is the CAM knowledgeable regarding risks and opportunities?

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.

Project Risk Analysis

Likelihood

What is the **likelihood** the risk will happen?		
Lvl	Likelihood	Planned approach and processes
1	Not likely	Will effectively avoid or mitigate this risk based on standard practices
2	Low likelihood	Have usually mitigated this type of risk with minimal oversight in similar cases
3	Likely	May mitigate this risk, but workarounds will be required
4	Highly likely	Cannot mitigate this risk, but a different approach might
5	Near certainty	Cannot mitigate this type of risk, no known processes or workarounds are available



Consequence

Given the risk is realized, what would be the magnitude of the impact?			
Lvl	Technical	Schedule	Cost
1	Minimal or no impact	Minimal or no impact	Minimal or no impact
2	Minor performance shortfall, same approach retained	Additional activities required, able to meet key dates	Budget increase or unit production cost increase <1%
3	Moderate performance shortfall, but workarounds available	Minor schedule slip, will miss need date	Budget increase or unit production cost increase <5%
4	Unacceptable, but workarounds available	Program critical path affected	Budget increase or unit production cost increase <10%
5	Unacceptable, no alternatives exist	Cannot achieve key program milestone	Budget increase or unit production cost increase >10%

Figure H-1: Technical, Schedule, and Cost Risk – Evaluation Criteria (Example)

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

Table H-2: Technical Risk Evaluation Criteria

Technical Risk – Evaluation Criteria	
Low (Green)	• Supplier project has developed a comprehensive technical 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 Supplier project effort and normal customer 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 technical measures of effectiveness and performance (MOE/MOP). • 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 Supplier project emphasis and close customer 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/project requirements, lacks adequate definition and identification of tasks in the baseline, or will not meet technical measures (MOE/MOP) 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 project within acceptable risk and is likely to cause a significant disruption to schedule, increased cost, or degradation of performance. • Risk is unacceptable even with Supplier project emphasis and close customer monitoring.

Table H-3: Schedule Risk Evaluation Criteria

Schedule Risk – Evaluation Criteria	
Low (Green)	• Time allocated for performing defined tasks to successfully achieve project objectives is adequate. All required contract work scope is represented in the baseline schedule. • Virtually all tasks are of appropriate duration, realistic float values, follow a logical sequence of work, and support vertical schedule traceability and contractual milestones. • Use of constraints and leads/lags are minimized to assess risk to critical path. Discrete task interdependencies, including major critical subcontracts, clearly identifies the project critical path to completion and critical paths to all major milestones. Schedule Health Check results have minor issues. • Normal Supplier project effort and customer monitoring are expected to resolve documented difficulties.
Medium (Yellow)	• Time allocated for performing defined tasks to successfully achieve the project objectives is marginally adequate. • Most required contract work scope is represented in the baseline schedule. • Greater than or equal to 80% of tasks are of appropriate duration, realistic float values, follow a logical sequence of work, and support vertical schedule traceability and contractual milestones. • Use of constraints and leads/lags is apparent but minimized to assess risks to critical path. The schedule is capable of forecasting downstream impacts to the demonstrated critical paths and/or most of the major critical subcontract work, and project milestones. Schedule Health Check results indicate moderate issues. • Special Supplier project emphasis and close customer monitoring are expected to resolve documented difficulties.
High (Red)	• Time allocated for performing defined tasks to successfully achieve the project objectives is inadequate. • Much of the required contract work scope is not represented in the baseline schedule. • Less than 80% of tasks are of appropriate duration, have realistic float values, follow a logical sequence of work, and support vertical schedule traceability and contractual milestones. Use of constraints and leads/lags are not minimized. Schedule Health Check results are unacceptable. • Project lacks a valid critical path(s) in which to assess schedule risk and the ability to forecast impacts to major critical subcontract work, and/or downstream milestones. • Risk is unacceptable even with Supplier project emphasis and close customer monitoring.

Table H-4: Cost Risk Evaluation Criteria

Cost Risk - Evaluation Criteria	
Low (Green)	• Performance Measurement Baseline (PMB) is executable within the project cost objectives for the authorized work scope. • Baseline is derived from a sound Basis of Estimate (BOE) using historical data or similar projects 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. • Normal Supplier project effort and normal customer monitoring can overcome difficulties.
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 projects 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 costs assigned are optimistic. • May cause a moderate increase in cost. • Special Supplier project emphasis and close customer monitoring will probably be able to overcome difficulties.
High (Red)	• PMB does not fully address project 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 is unacceptable even with Supplier project emphasis and close customer monitoring.

Table H-5: Resource Risk Evaluation Criteria

Resource Risk - Evaluation Criteria	
Low (Green)	• Resources (e.g., facilities, personnel, skills) to support task planning within the project schedule are adequate. • Has little potential to cause disruption of schedule, increased cost, or degradation of performance. • Normal Supplier project effort and normal customer monitoring can overcome difficulties.
Medium (Yellow)	• Resources (e.g., facilities, personnel, skills) to support task planning within the project schedule are inadequate; availabilities and constraints not fully considered. • Can potentially cause some disruption of schedule, increased cost, or degradation of performance. • Special Supplier project emphasis and close customer monitoring will probably be able to overcome difficulties.
High (Red)	• Resources (e.g., facilities, personnel, skills) to support task planning within the project schedule are inadequate; availabilities and constraints not fully considered and likely to cause a significant disruption of schedule, increased cost, or degradation of performance. • Risk is unacceptable even with Supplier project emphasis and close customer monitoring.

Table H-6: Management Processes Risk Evaluation Criteria

Management Processes Risk - Evaluation Criteria	
Low (Green)	• Management processes provide timely and accurate performance data. • Processes are in place for baseline maintenance, risk mgmt. (MR reasonable), scheduling, EAC updates, subcontract mgmt., managerial analysis, etc. • Performance Measurement Techniques (PMTs) are appropriate, provide objective determination of progress, and correlate with technical achievement. • Processes are formally documented and are being used to manage the project. • CAM sufficiently trained and knowledgeable of business processes, EVM and CAM roles/responsibilities. • Few issues have been identified with the processes or how they are being applied. • Has little potential to cause disruption of schedule, increased cost, or degradation of performance. • Normal Supplier project effort and normal customer monitoring can overcome difficulties.
Medium (Yellow)	• There are concerns that the management processes might hinder timely and accurate performance data. • Most, but not all, processes are in place for baseline maintenance, risk mgmt. (MR questionable), subcontract mgmt., managerial analysis, scheduling, EAC updates, etc. • PMTs could be more objective and correlate more closely with technical achievement. • Some processes are not fully documented. • CAM requires additional training and knowledge of business processes, EVM and CAM roles/responsibilities. • Discussions indicate CAMs are not correctly using the management processes. • Can potentially cause some disruption of schedule, increased cost, or degradation of performance. • Special Supplier project emphasis and close customer monitoring will probably be able to overcome difficulties.
High (Red)	• Concerns that the management processes will prevent accurate and timely reporting of performance data. • Few management processes are in place for baseline maintenance, risk mgmt. (MR inadequate), subcontract mgmt., managerial analysis, scheduling, EAC updates, etc. • Wrong use of PMTs and/or are subjective and do not correlate with technical achievement. • Processes are not documented. • CAM is not trained or knowledgeable of business processes, EVM and CAM roles/responsibilities. • Discussions indicate CAMs are not using the management processes. • High probability of significant schedule issues, increased cost, and/or degradation of performance. • Inadequate integration between cost and scheduling systems. • Risk is unacceptable even with Supplier project emphasis and close customer monitoring.

APPENDIX I: Findings/Action Items Log

No.	Finding Type	IBR Area (Technical, Schedule, Cost, Resources, Management Processes, or General)	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? (Yes/No)	Confirmation of Completion (Objective Evidence)	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,

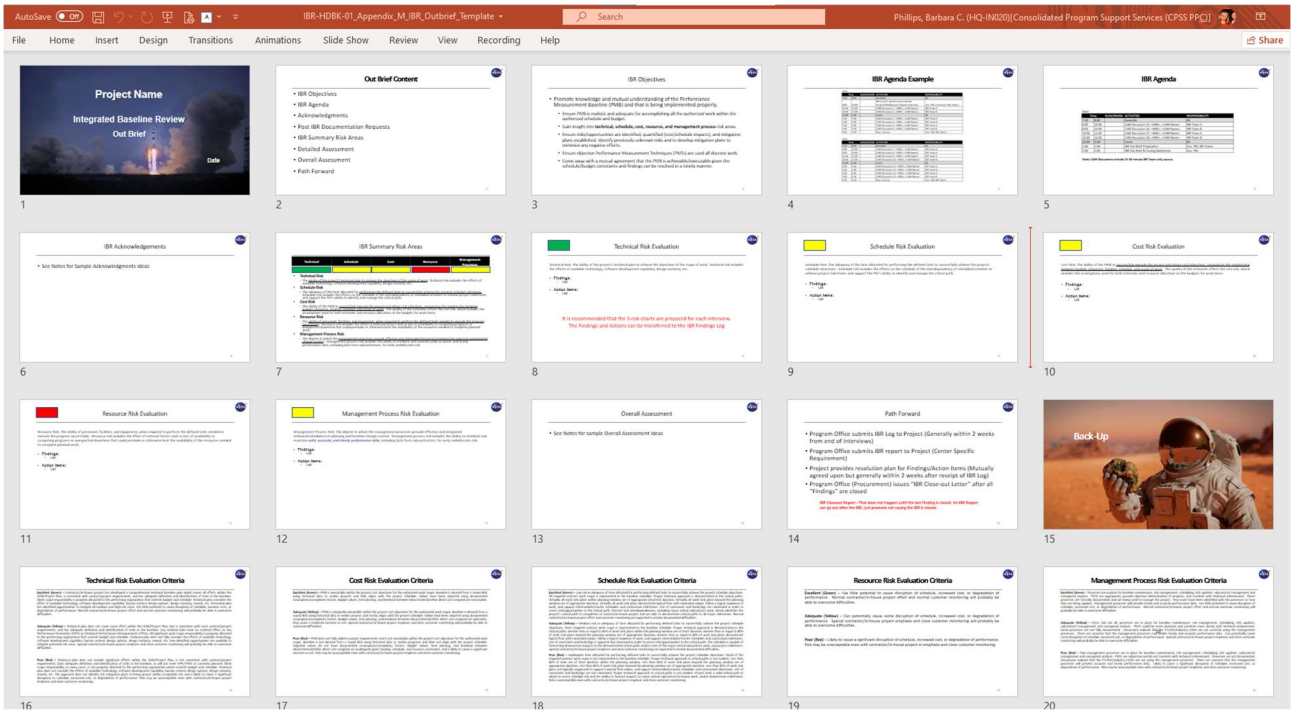
_____

<PM Name>
Project Manager

<Project Name> Project

APPENDIX M: IBR Out brief Template

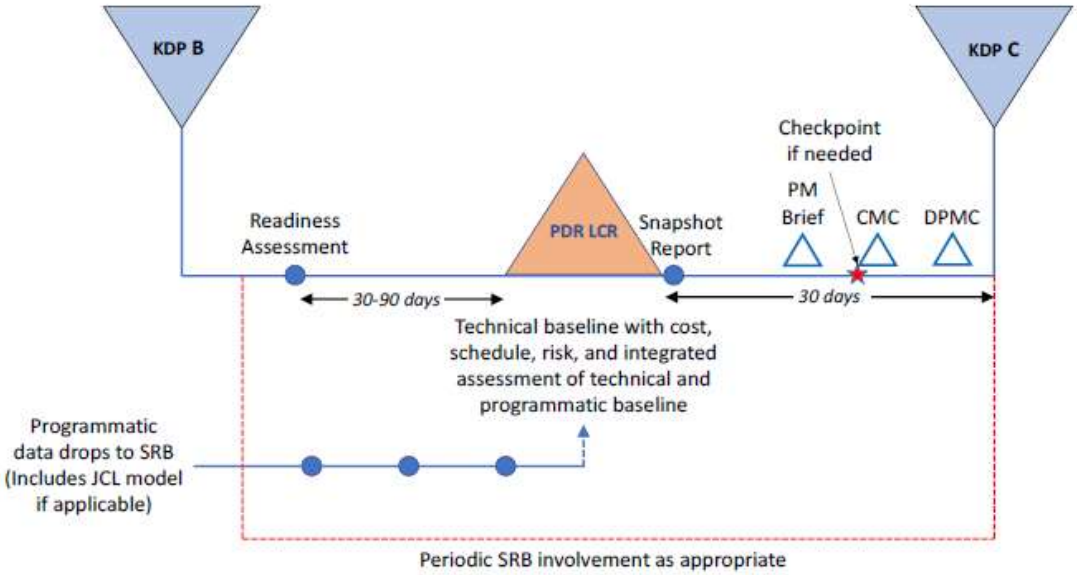
(editable version available at: [NASA EVM WG Community Teams site])



APPENDIX N: Streamlined IBR Process

Streamlined IBR and the One & Two-Step Preliminary Design Review (PDR) Process

- **<u>One-Step PDR Process</u>**
    - For a One-Step PDR, the Pre-KDP C IBR (project-level) should be "part of" or conducted before PDR, because there is only 1-month between a One-Step PDR and KDP C.
    - CAMS are involved in PDR, so extend the duration to account for streamlined CAM Discussions or conduct CAM Discussions prior to PDR. Typically, no more than 2 additional hours of their time.
    - PDR Readiness Assessment is 30-90 days before a PDR. The Pre-KDP C IBR could occur then or during PDR - tailorable by the PM.
    - All programmatic documentation is due at PDR, including the PMB, per NPR 7120.5, a preliminary PMB is acceptable for a Pre-KDP C IBRs.
    - All sub-PDRs/IBRs should be conducted before project level PDR/IBR (see NFS). If not, use the proposal and conduct delta IBRs (CAM Discussions), as necessary.
    - Post KDP C, a formal project-level IBR shall occur within 6-months of KDP C once all implementation scope is awarded, and a complete PMB is established and resourced. The Pre-KDP C IBR artifacts can serve as the foundation for follow-on IBRs supporting continuous evaluation and assessments.

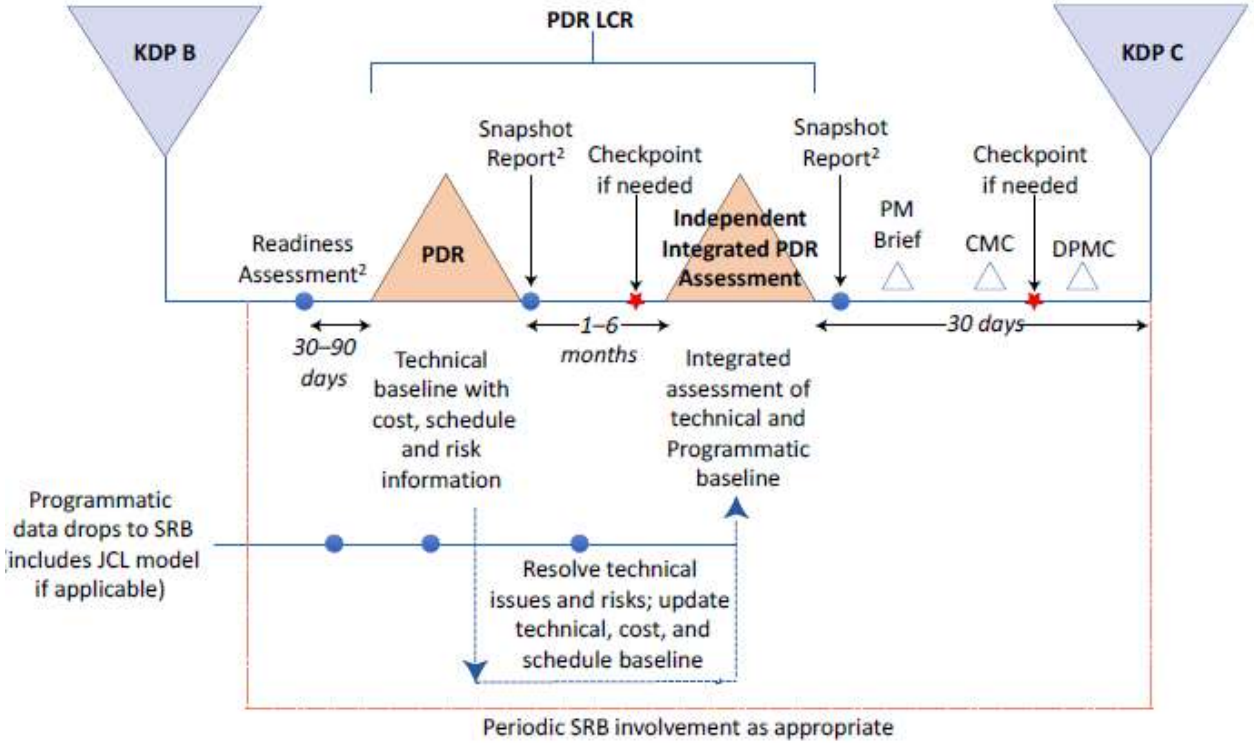


Acronyms: CMC = Center Management Council, DPMC = Directorate Program Management Council, JCL = Joint Cost and Schedule Confidence Level, KDP = Key Decision Point, LCR = Life-Cycle Review, PM = Program or Project Manager.

Notes: A one- or two-step review may be used for any LCR. This handbook provides information on the readiness assessment, snapshot reports, and checkpoints associated with LCRs. Figure is not drawn to scale.

Figure N-1: One-Step PDR Life-Cycle Review Overview from NASA PM Handbook

- **<u>Two-Step PDR Process</u>**
    - For a Two-Step PDR there is approximately 6-months between PDR and KDP C, and agency agreement relative to timing of this IBR is 2-months after PDR.
    - All programmatic documentation is due at PDR, including the PMB, per NPR 7120.5, a preliminary PMB is acceptable for a Pre-KDP C IBRs.
    - All sub-PDRs/IBRs should be conducted before project level PDR/IBR (see NFS). If not, use the proposal and conduct delta IBRs (CAM Discussions), as necessary.
    - Post KDP C, a formal project-level IBR shall occur within 6-months of KDP C once all implementation scope is awarded, and a complete PMB is established and resourced. The Pre-KDP C IBR artifacts can serve as the foundation for follow-on IBRs supporting continuous evaluation and assessments.



Acronyms: CMC = Center Management Council, DPMC = Directorate Program Management Council, JCL = Joint Cost and Schedule Confidence Level, KDP = Key Decision Point, LCR = Life-Cycle Review, PDR = Preliminary Design Review, PM = Program or Project Manager.

Notes: A one- or two-step review may be used for any LCR. This handbook provides information on the readiness assessment, snapshot reports, and checkpoints associated with LCRs. Figure is not drawn to scale.

Figure N-2: Two-Step PDR Life-Cycle Review Overview from NASA PM Handbook

The following tables discuss the activates compared to the Traditional IBR and the Streamlined IBR for the pre, during, and post IBR event.

Table N-1: IBR Process Comparison (Pre-IBR Event)

Activity	Traditional IBR	Streamlined IBR
Determine IBR Need (Notification, request data artifacts)	X	X
Establish Team, Conduct Team Training	X	X
Verify CAMs are trained, and understand CAM Discussion (data demonstration expectations)		X
Conduct Joint IBR Training	X	X
Coordinate Logistics	X	X
Review Data Artifacts (Conduct Data Traces, Formulate IBR Questions, etc.)	X	
Review Data Artifacts (Assess Quality – Go/No Go Decision or Delay Recommendation; Conduct Data Traces; Formulate IBR Questions; Obtain Pre-answers/virtual data demonstrations to generic/common questions)		X
Conduct Project Overview, Monthly EVM/Business Processes, Conduct Schedule Deep Dive		X
Finalize agenda	X	X

Table N-2: IBR Process Comparison (IBR Event)

Activity	Traditional IBR	Streamlined IBR
In-brief (+/- 4hrs) IBR Objectives, Project Overview, EVM/Business Process, etc.	X	
Traditional CAM Discussions	X	
Focused CAM Discussions (2hrs max)		X
CAM Discussion Assessment Form, required		X
Dailey Caucus w/ Everyone (+/- 1hr)	X	
Out-brief (+/- 1hr)	X	
Declare initial PMB (Achievable, Not Achievable (findings), Cannot be Determined (Delta)		X

Table N-3: IBR Process Comparison (Post-IBR Event)

Activity	Traditional IBR	Streamlined IBR
Finalize Findings (Risk Rated) and Action Items Log	X	X
CO Issue IBR Report/Letter, if Contractor IBR	X	X
Out-brief (1hr)		X
Monitor close out of Findings and Action Items	X	X

Streamlined CAM Discussions

- Preparation is paramount!
- CAMs must be trained and available prior to IBR event
- Ensure expectations and responsibilities of Team and CAMs are clearly understood
- No PowerPoints
- Focused questions based on analysis, risk areas
- CAM must be able to demonstrate existing data
- Watch the clock, if time runs out set up a virtual follow on the next week

- Limit attendance (~10 people (5 Gov, 5 Contractor/In-house) CAM, Analysts (Scheduler, EVM, Resource, etc.), Contracts/ Business)
- CAM must demonstrate with their data via an eCAM Notebook, SharePoint, etc.
- Avoid questions that may lead to a Yes/No response only

Benefits of Streamlined IBR Approach

- Significant time/cost savings
    - Many IBR Event activities can be done during the Pre/Post-Event stages
    - No in-briefs and out-briefs are virtual. Many stakeholders will not need to travel and incur expenses/time away
    - Reduce CAM Discussions to 1.5hrs minimum, 2 hours max - more focused discussions
    - CAMs are only needed for their allotted time slot, not sequestered for the multi-day event
    - No PowerPoint Presentations, no data to develop. This is a demonstration of existing data and specific Q&A discussion
- IBRs can be done more often, repeatable/incremental process
- Improves CAM ownership, management, and accountability of their Control Account(s), ensures use of eCAM Notebook or other data repository
- Improves CAM training, and embracing EVM as an integrated program management approach
- Ensures compliance with NPR 7120.5, whether a 1 or 2 Step PDR Process (contractors follow NFS) with establishing an initial PMB/IBR. Official PMB after KDP-C decision /w additional CAM discussions as appropriate
- KDPs and other reviews will benefit from a well-maintained baseline plan, and meaningful IBR findings for informed decision making
- Establishes a proactive, positive working relationship between stakeholders
- Improves communication and risk management (credibility and predictive analysis of risks/opportunities) to enable early warning and accelerate course corrections
- Promotes greater program advocacy of IBR understanding, execution, and overall support of mission objectives

APPENDIX O: 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
COR	Contracting Officer Representative
DCMA	Defense Contract Management Agency
EIA	Electronic Industries Alliance
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
FAR	Federal Acquisition Regulation
IBR	Integrated Baseline Review
IMS	Integrated Master Schedule
IPMDAR	Integrated Program Management Data Analysis Report
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
NDIA	National Defense Industry Association
NFS	NASA FAR Supplement
NOJOMO	NASA Office of JPL Management and Oversight
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
OBS	Organization Breakdown Structure
OCFO	Office of Chief Financial Officer

OP	Office of Procurement
PBB	Project Budget Base
PM	Program or Project Manager
PMB	Performance Measurement Baseline
PMT	Performance Measurement Techniques
RAM	Responsibility Assignment Matrix
RFP	Request for Proposal
SME	Subject Matter Expert
SOW	Statement of Work
SP	Special Publication
SRB	Standing Review Board
STI	Scientific and Technical Information
UB	Undistributed Budget
UFE	Unallocated Future Expense
WAD	Work Authorization Document
WBS	Work Breakdown Structure
WP	Work Package

APPENDIX P: 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 contract in accordance with the terms and conditions of the contract.

Baseline Change Request (BCR). A form used to document and justify a proposed change to either the EAC or the Performance Measurement Baseline (PMB).

Basis of Estimate (BOE). The documentation of the ground rules, assumptions, and drivers used in developing the cost and schedule estimates, including applicable model inputs, rationale or justification for analogies, and details supporting cost and schedule estimates. The BOE is contained in material available to the Standing Review Board (SRB) and management as part of the life-cycle review and Key Decision Point (KDP) process.

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)

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.)

Control Account (CA). 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 (CAM). NASA manager or technical expert responsible for one or multiple control accounts within the PMB and for planning and managing the resources authorized to accomplish such scope.

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 PMTs, 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 SME 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 SMEs from each center, and 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 = Inception to date ACWP + ETC.

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

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 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, or IPMDAR.

Integrated Program Management Data Analysis Report (IPMDAR). Contains data for measuring contract execution progress on Government acquisition contracts. The IPMDAR's primary purpose to the Government is to reflect current contract performance status and the forecast of future contract performance. This Data Item Description (DID) contains the format, content requirements, and intended use of information for the data deliverable resulting from the work task described in the solicitation.

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 PMs 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.

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.

Life Cycle Cost Estimate (LCCE). An estimate of the total of the direct, indirect, recurring, nonrecurring, and other related expenses both incurred and estimated to be incurred in the design, development, verification, production, deployment, prime mission operation, maintenance, support, and disposal of a project, including closeout, but not extended operations. The LCC of a project or system can also be defined as the total cost of ownership over the project or system's planned life cycle from Formulation (excluding Pre–Phase A) through Implementation (excluding extended operations). The LCCE includes the cost of the launch vehicle.

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 PMB.

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. 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 PMTs if EVM is not required. It is formed by the budgets assigned to scheduled CAs and the applicable indirect budgets. For future effort, not planned to the CA level, the PMB also includes budgets assigned to higher level WBS elements and UBs. The PMB does not include UFE, or 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 Budget Base (PBB). The negotiated value of the project plus the estimated cost of authorized, unpriced work. It is the Government project equivalent to the Contract Budget Base. It includes the PMB and MR. Customer approval is generally required to change it.

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

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

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

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

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

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

Work Breakdown Structure (WBS). The product-oriented hierarchical breakdown 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.

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