



Integrated Project
Management:
Tear Down those Walls

NASA PM Challenge 2008



Agenda

- ▶ Overview of What is Integrated Project Management?
- ▶ Examples of Outputs from an IPM Environment
- ▶ Overview of IPM Process from Planning through Execution



What is Integrated Project Management



There is no universal definition for Integrated Project Management

....disciplined approach to effectively and affordably acquire goods and services to meet user needs....

—*The Integrated Project Management Handbook*

....establish and manage the project and the involvement of the relevant stakeholders according to an integrated and defined process that is tailored from organization's set of standard processes....

— *CMMI, Project Management Process at Maturity Level 3*

... methodology that incorporates a singular centralized data structure to support reporting criteria and actual decision supporting process....

— *PM software company*

...integrating the PMI® key components into an approach to managing business decision and project execution....

— *Integrated Project Management Publication*



Within NASA, the Exploration Systems Mission Directorate (ESMD) has defined Integrated Program Management (IPM)

Per the Memorandum December 7th 2007, from the Associate Administrator for ESMD
Richard J. Gilbrech

Integrated Program Management (IPM) represents:

- ▶ An integrated, disciplined approach to project management designed to ensure that scope, cost, schedule and risk are all addressed in the planning and control process
- ▶ A management structure that provides better planning, more reliable status reporting and an “early warning” system for potential technical, manufacturing, cost, and schedule performance problems

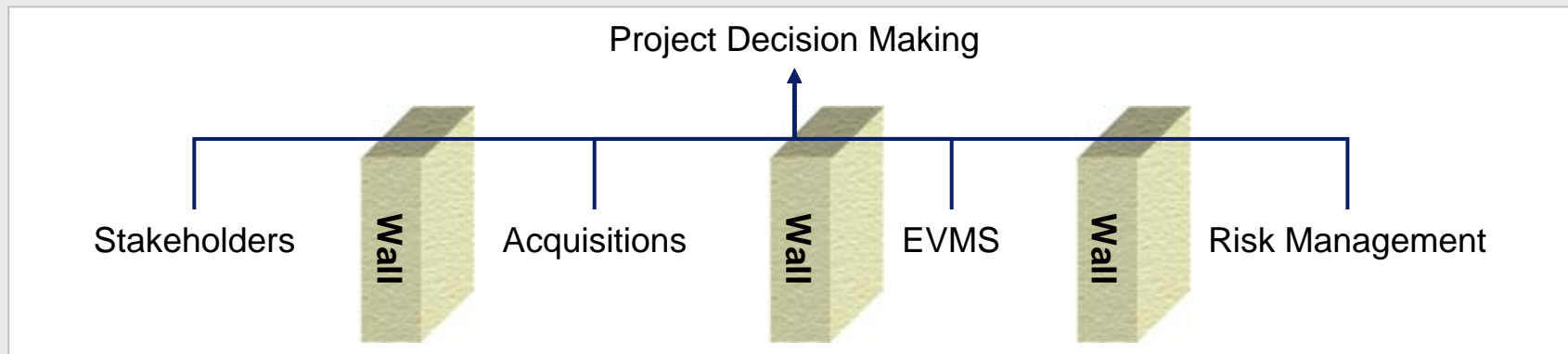
IPM is NOT:

- ▶ A financial or “cost management” discipline that sits along side “regular” project management
- ▶ A software or information system
- ▶ Something for “cost” people to worry about (while others worry about schedule and the technical work scope)
- ▶ A set of financial metrics and specific report formats

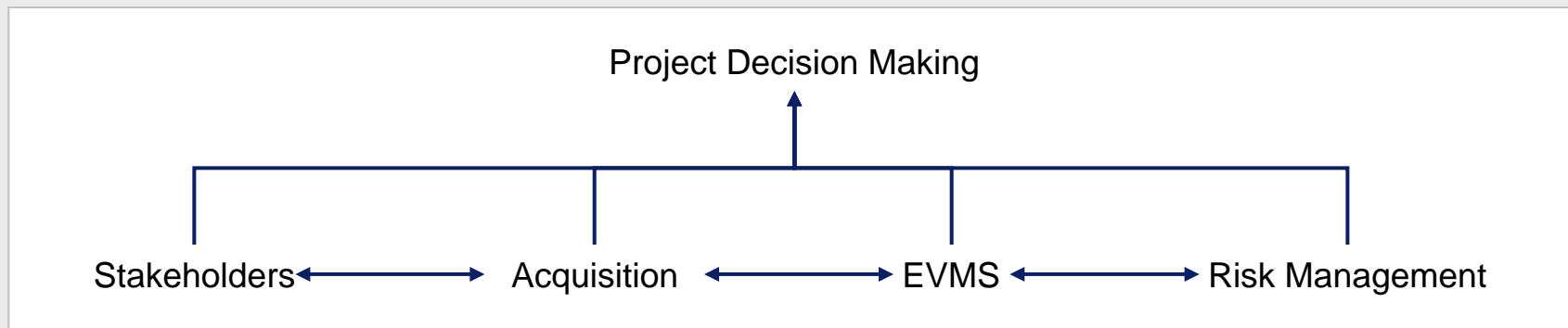


The key to IPM – Tearing down the walls between key project management capabilities to provide realistic decision making

Traditional Project Management Approach



Integrated Project Management Approach



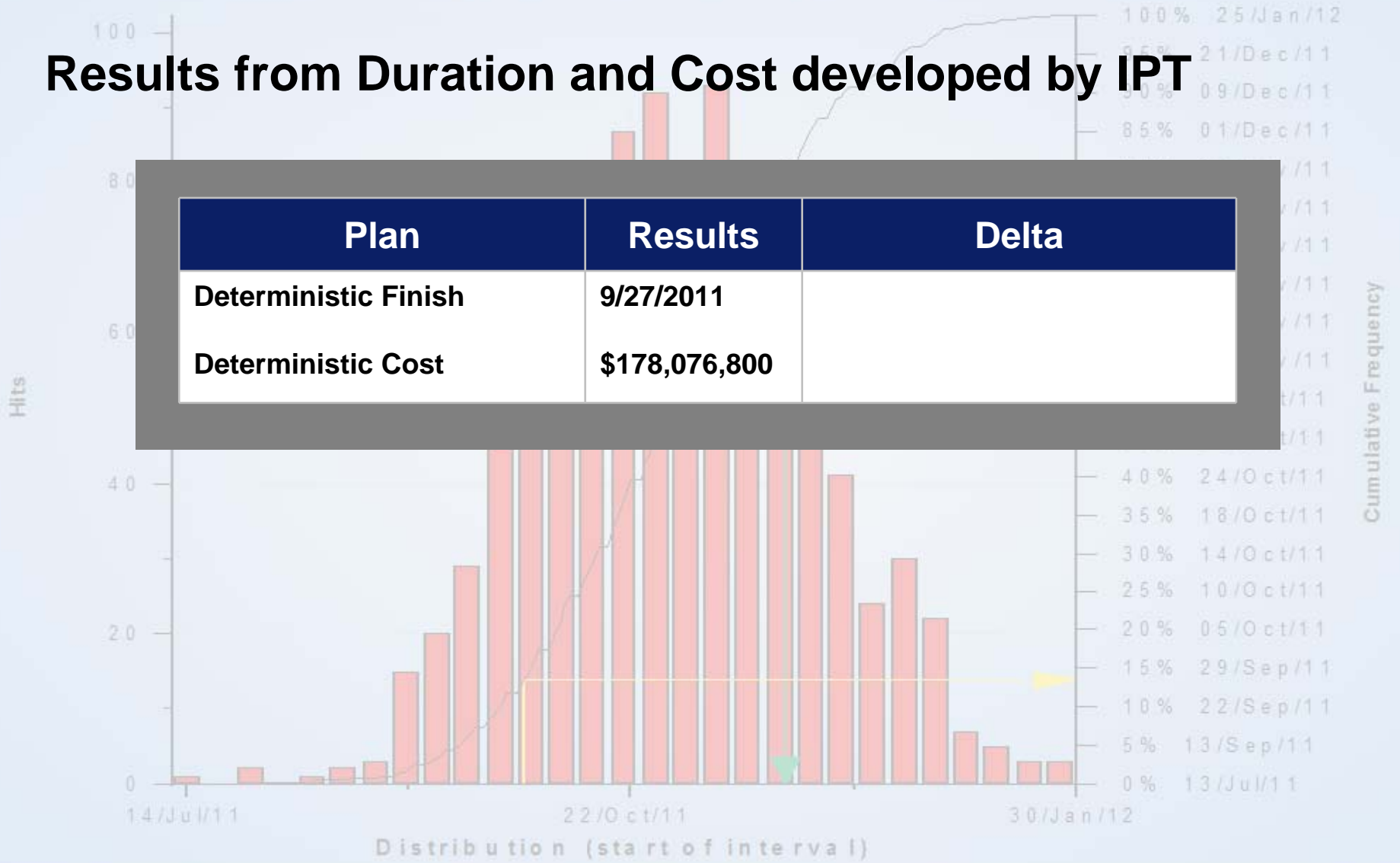
Examples of Outputs from an IPM Environment



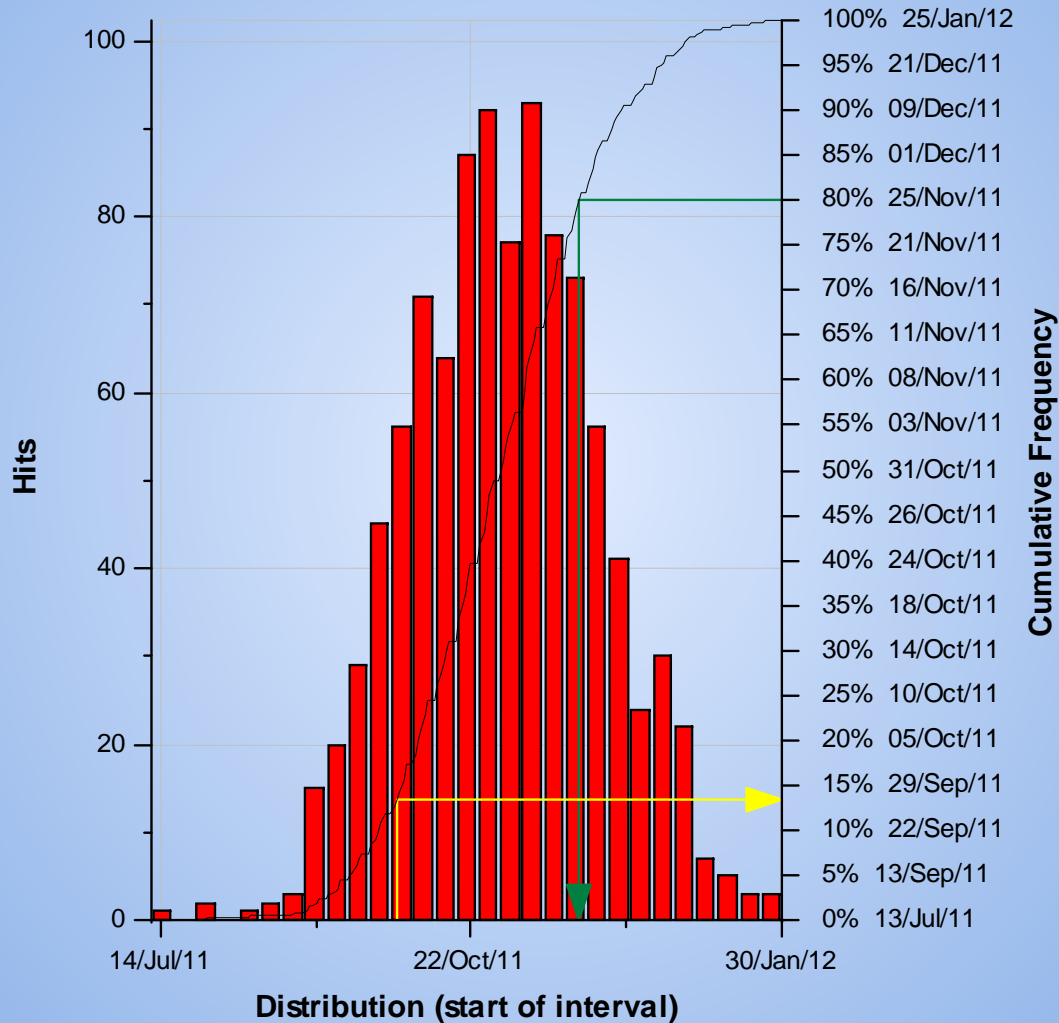
New Attack Submarine Entire Plan : Finish Date

Results from Duration and Cost developed by IPT

Plan	Results	Delta
Deterministic Finish	9/27/2011	
Deterministic Cost	\$178,076,800	



DoD Program (Sample Data) Entire Plan : Finish Date



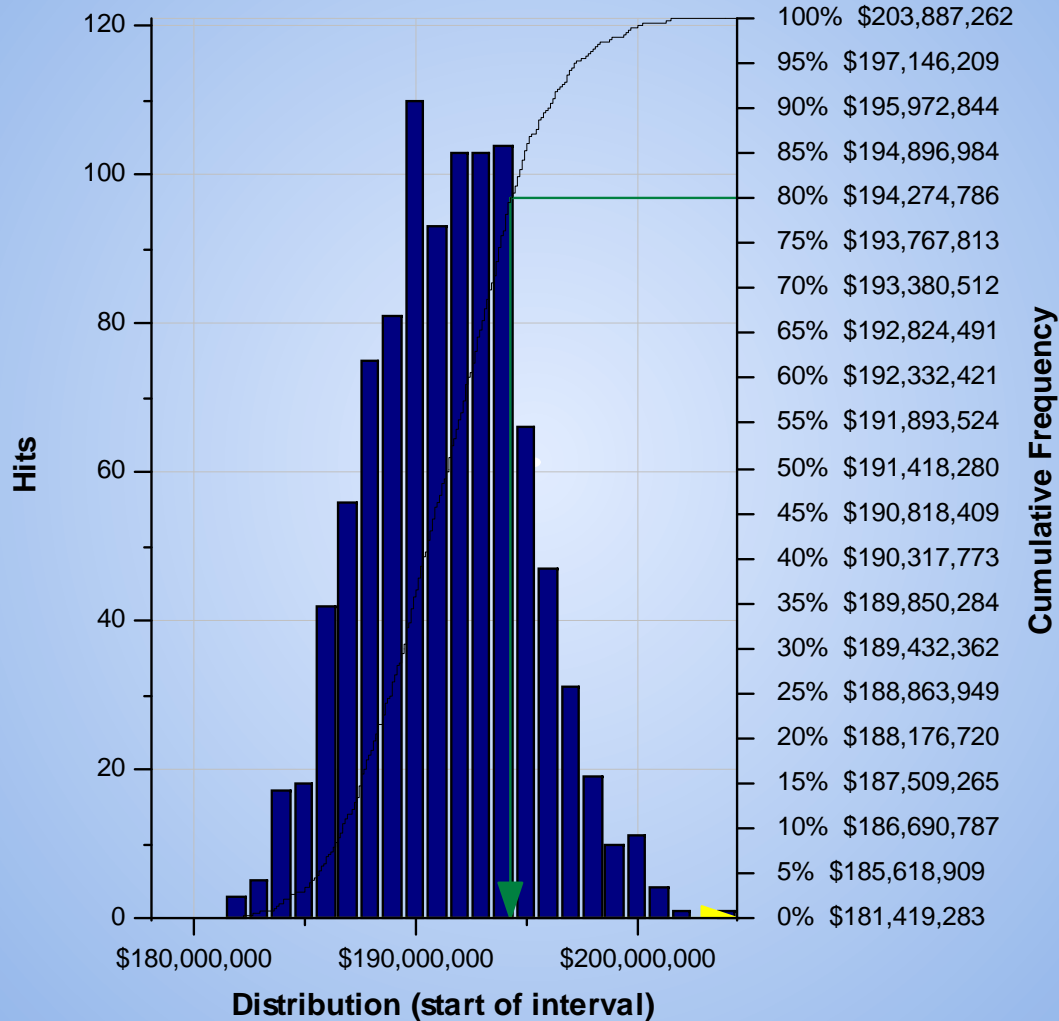
Results from Duration Uncertainty

Once Duration Uncertainty is applied to the schedule there is only a 14% chance of meeting the Deterministic Finish date of 9/27/2011, but there is an 80% chance that the project will finish on or before 11/25/2011.

14% (Deterministic)	9/27/2011
80%	11/25/2011



DoD Program (Sample Data) Entire Plan : Cost



Cost Results from Duration and Cost Uncertainty

Reveals a 0% probability of finishing the project at or under the Deterministic Cost of \$178,076,800, but an 80% probability of completing the project at or below \$194,274,786.

0% (Deterministic)	\$178,076,800
80%	\$194,274,786



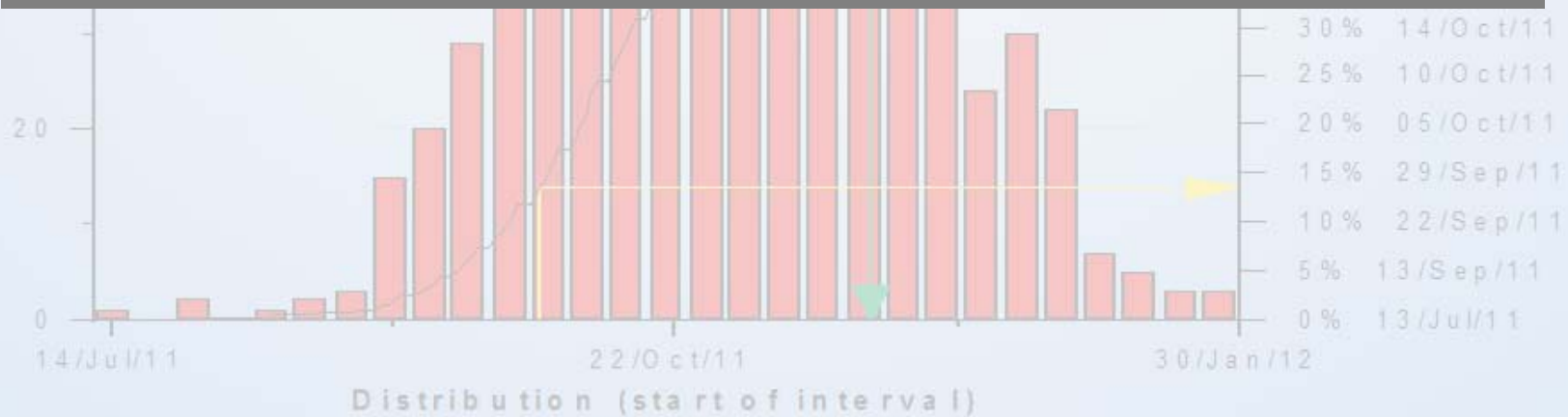
New Attack Submarine Entire Plan : Finish Date

Results from Duration Uncertainty

Plan	Results	Delta
Deterministic Finish	9/27/2011	
Deterministic Cost	\$178,076,800	
Finish Dates with Uncertainty	11/25/2011	2 months beyond predicted finish
Cost Results with Uncertainty	\$194,274,785	\$16,197,985 delta

Hits

Cumulative Frequency

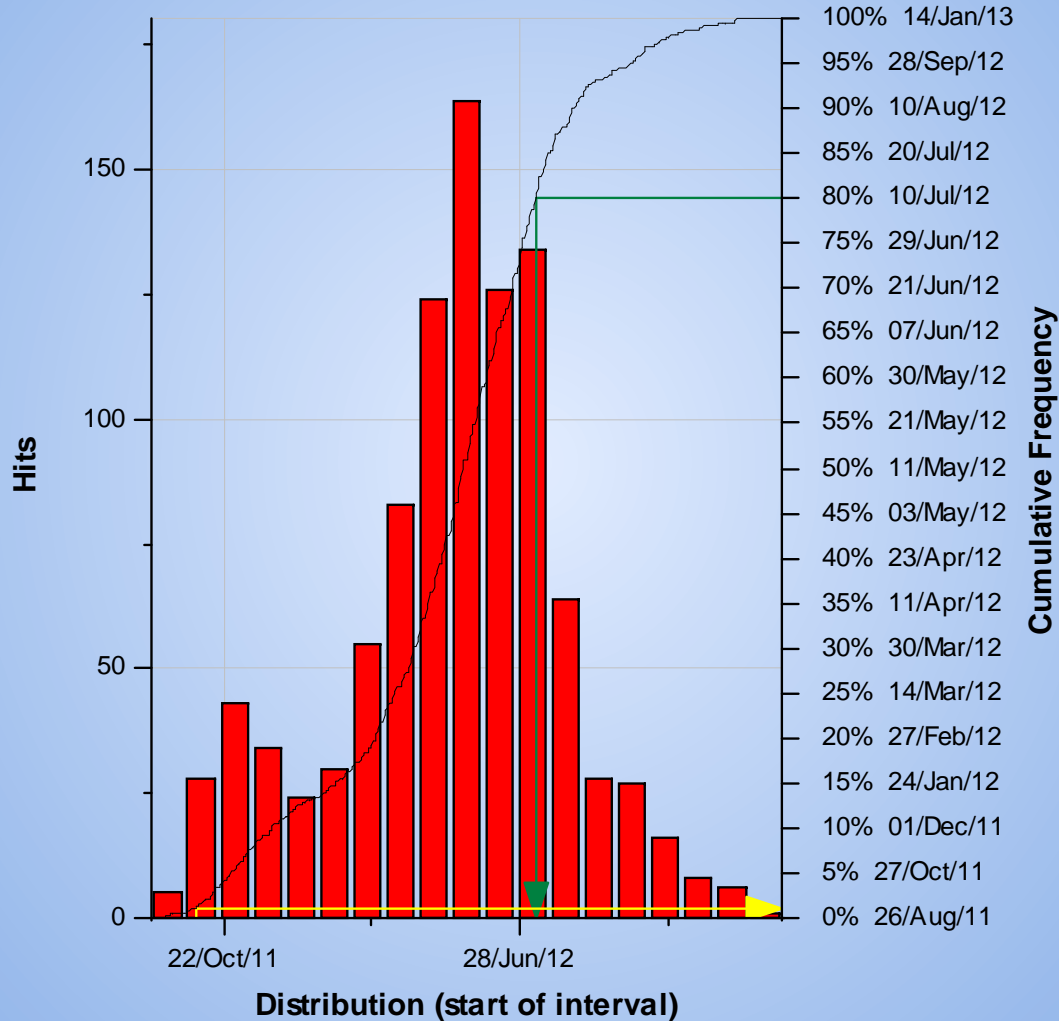


Now we can simulate results from a Pre-Mitigation and Post-Mitigation perspective

Plan	Results	Delta
Deterministic Finish	9/27/2011	
Deterministic Cost	\$178,076,800	
Finish Dates with Uncertainty	11/25/2011	2 months beyond predicted finish
Cost Results with Uncertainty	\$194,274,785	\$16,197,985 delta
Finish Dates with Uncertainty and Risks (Before Mitigation)	?	?
Cost Results with Uncertainty and Risks (Before Mitigation)	?	?
Finish Dates with Uncertainty and Risks (After Mitigation)	?	?
Cost Results with Uncertainty and Risks (After Mitigation)	?	?



DoD Program (Sample Data) (Pre-mitigated) Entire Plan : Finish Date



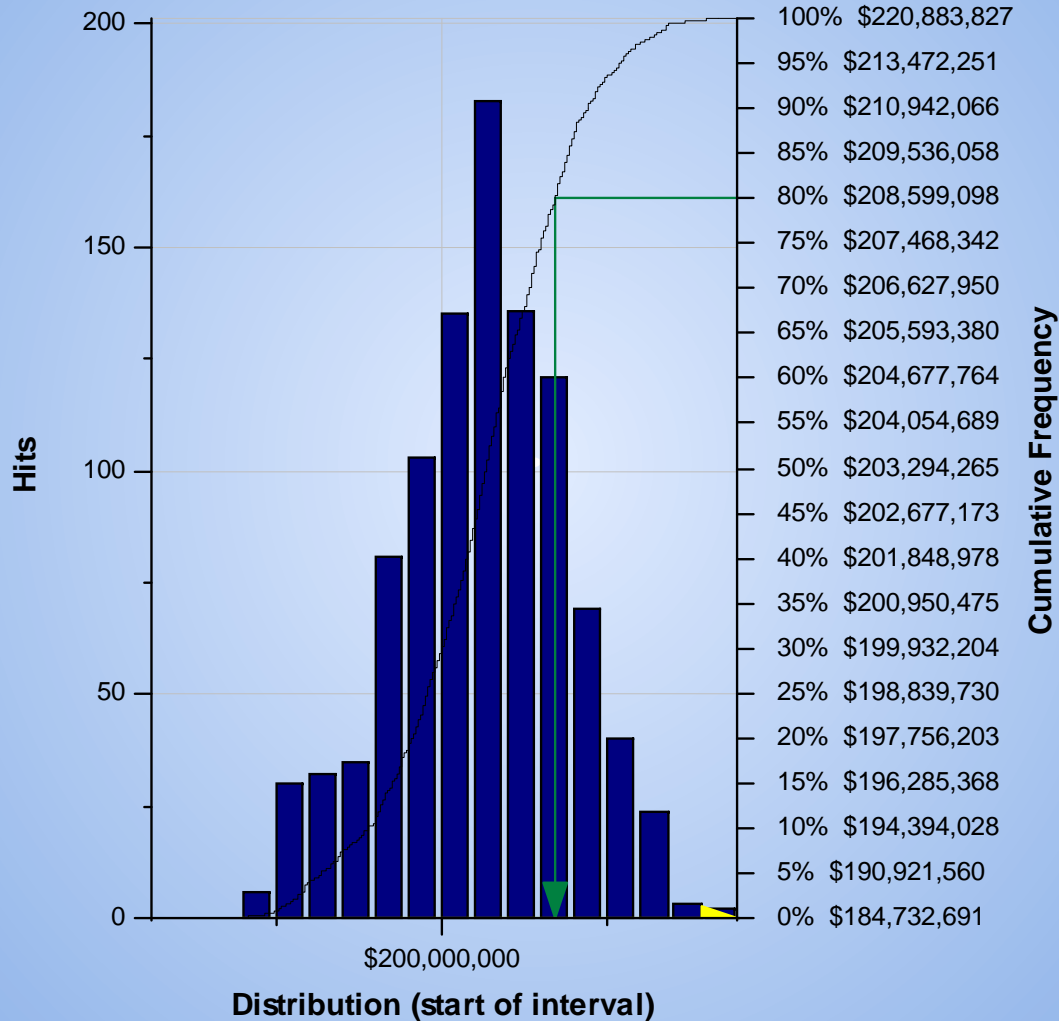
Results from combining Duration Uncertainty and Risk Register (before mitigation)

When risks are applied to the schedule the odds of meeting the Deterministic Finish date drop to 1% and the 80% date extends to 7/10/2012

1% (Deterministic)	9/27/2011
80%	7/10/2012



DoD Program (Sample Data) (Pre-mitigated) Entire Plan : Cost



Cost results from combining Duration and Cost Uncertainty with Risk Register (before mitigation)

When risks are applied to the schedule the 80% cost threshold increases to \$208,599,098

0% (Deterministic)	\$178,076,800
80%	\$208,599,098

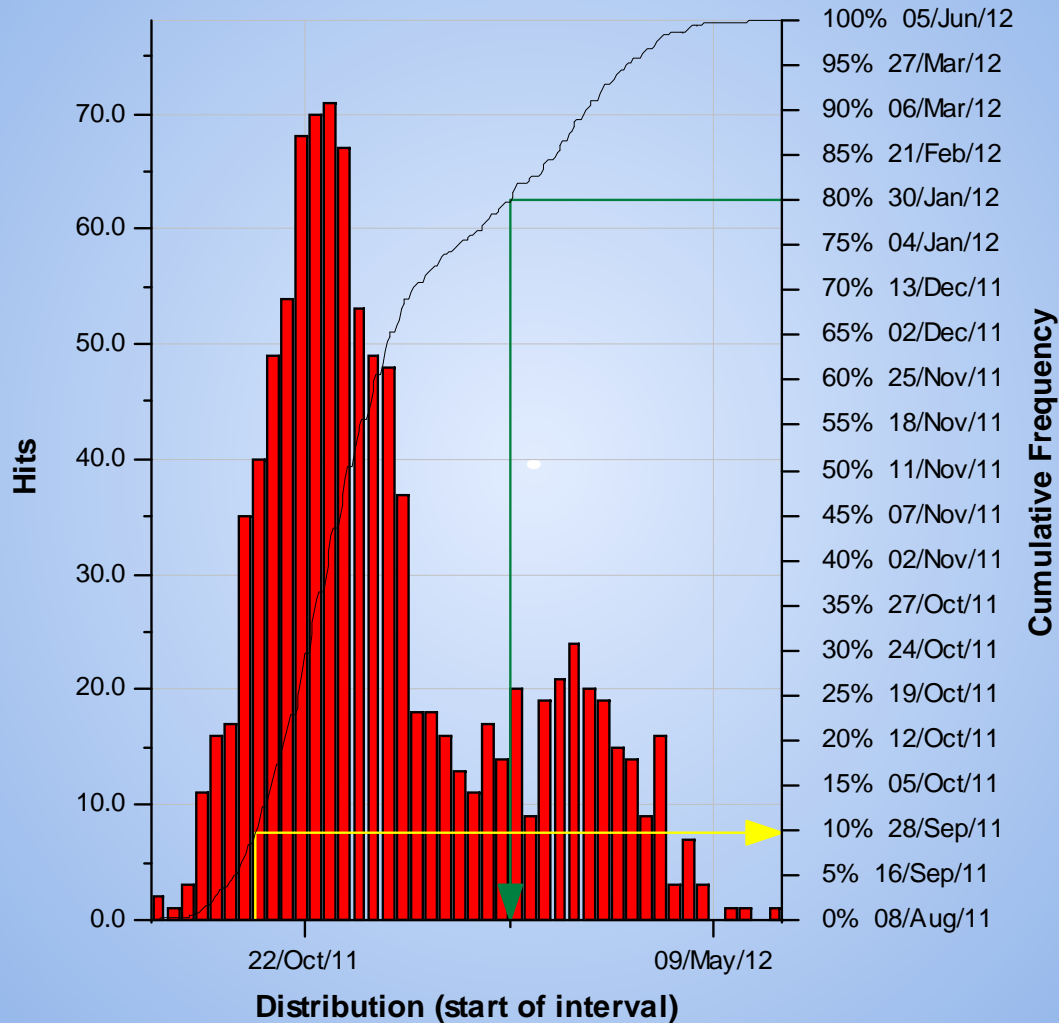


Results from Duration Uncertainty and Risks (before mitigation)

Plan	Results	Delta
Deterministic Finish	9/27/2011	
Deterministic Cost	\$178,076,800	
Finish Dates with Uncertainty	11/25/2011	2 months beyond predicted finish
Cost Results with Uncertainty	\$194,274,785	\$16,197,985 delta
Finish Dates with Uncertainty and Risks (Before Mitigation)	7/10/2012	10 months beyond predicted finish
Cost Results with Uncertainty and Risks (Before Mitigation)	\$208,599,098	\$30,522,298 delta



DoD Program (Sample Data) (Post-mitigated) Entire Plan : Finish Date



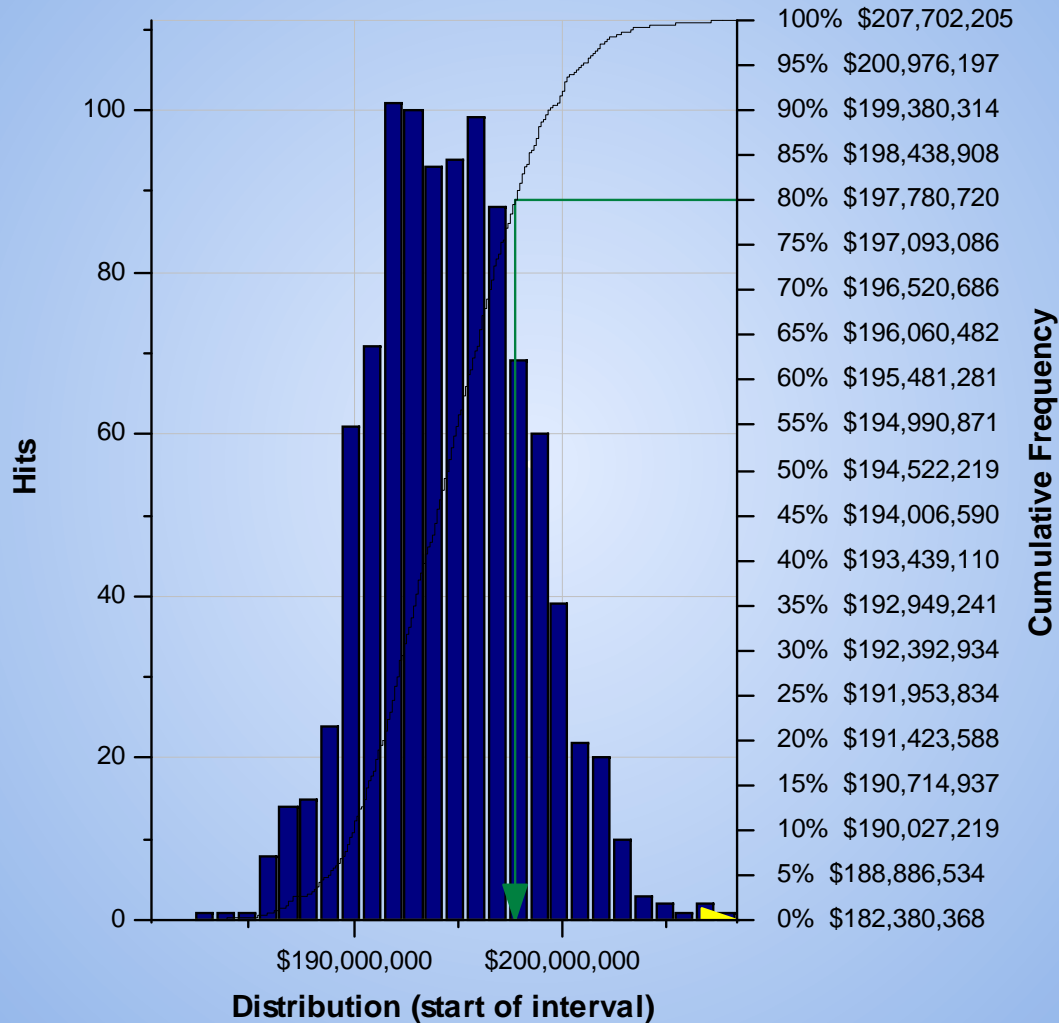
Results from combining Duration Uncertainty and Risk Register (after mitigation)

After risks have been mitigated the odds of completing by the Deterministic Finish date increase to 10% and the 80% date moves closer to the Deterministic Finish date

10% (Deterministic)	9/27/2011
80%	1/30/2012



DoD Program (Sample Data) (Post-mitigated) Entire Plan : Cost



**Cost results from combining
Duration and Cost
Uncertainty with Risk
Register (after mitigation)**

When risks are mitigated the
80% cost threshold
decreases to \$197,780,720

0% (Deterministic)	\$178,076,800
80%	\$197,780,720



Results from Duration Uncertainty and Risks (after mitigation)

Plan	Results	Delta
Deterministic Finish	9/27/2011	
Deterministic Cost	\$178,076,800	
Finish Dates with Uncertainty	11/25/2011	2 months beyond predicted finish
Cost Results with Uncertainty	\$194,274,785	\$16,197,985 delta
Finish Dates with Uncertainty and Risks (Before Mitigation)	7/10/2012	10 months beyond predicted finish
Cost Results with Uncertainty and Risks (Before Mitigation)	\$208,599,098	\$30,522,298 delta
Finish Dates with Uncertainty and Risks (After Mitigation)	1/30/2012	4 months beyond predicted finish
Cost Results with Uncertainty and Risks (After Mitigation)	\$197,780,720	\$19,703,920 delta



Overview of IPM Process from Planning through Execution



Planning

Step 1 Key Stakeholder

- ▶ ESMD, AA, SOMD – define the “What”
 - Key Performance Parameters (KPP)
- ↕
- ▶ NASA Org (Center, Program, Project)
 - KPP defined within the Performance Measurement Baseline (PMB)
- ↕
- ▶ Contract

Step 2 Integrated Baseline Review (IBR)

- ▶ Understand and verify KPP
- ▶ Verify the Contractor's Technical, Cost, Schedule, Resources and Management Risks and Drivers as they relate to KPPs

Step 3 Post IBR

- ▶ Update/Revise Project Management Plan Documents
 - Risk Management Plan
 - EVMS
 - IMS
 - Technical Documents
 - CDRL

Verification

Step 4 Verify Technical Drivers

- ▶ Verify link to KPPs
- ▶ Verify Feasibility
- ▶ Define Technical Performance Metrics (TPM) to verify KPPs (if necessary)
- ▶ Negotiate modifications

Step 5 Verify IMS

- ▶ WBS is complete
- ▶ IMP/IMS is integrated
- ▶ KPP and milestones are identified and achievable
- ▶ Critical path verified
- ▶ Risks identified

Step 6 Verify EVMS

- ▶ Evaluate EVMS approach
 - Data Utilization and Management
 - Reporting and Communication
 - Management Decision Making

Step 7 Verify PMB

- ▶ Codification of KPP, IMS and EVMS
- ▶ Baseline maintenance process to ensure PMB represents the current plan
- ▶ Verify EVMS baseline correlates with actual performance

Execution

Step 8 Cost and Schedule Analysis

- ▶ Verify correlation between EV schedule metrics, critical path and risk drivers
- ▶ Verify correlation between EV cost metrics, critical path and risk drivers

Step 9 Estimate at Complete

- ▶ The EVMS provides an EAC range using EVM performance factors (SPI,CPI)
- ▶ Risk can be applied to EAC factors for risk-adjusted EAC

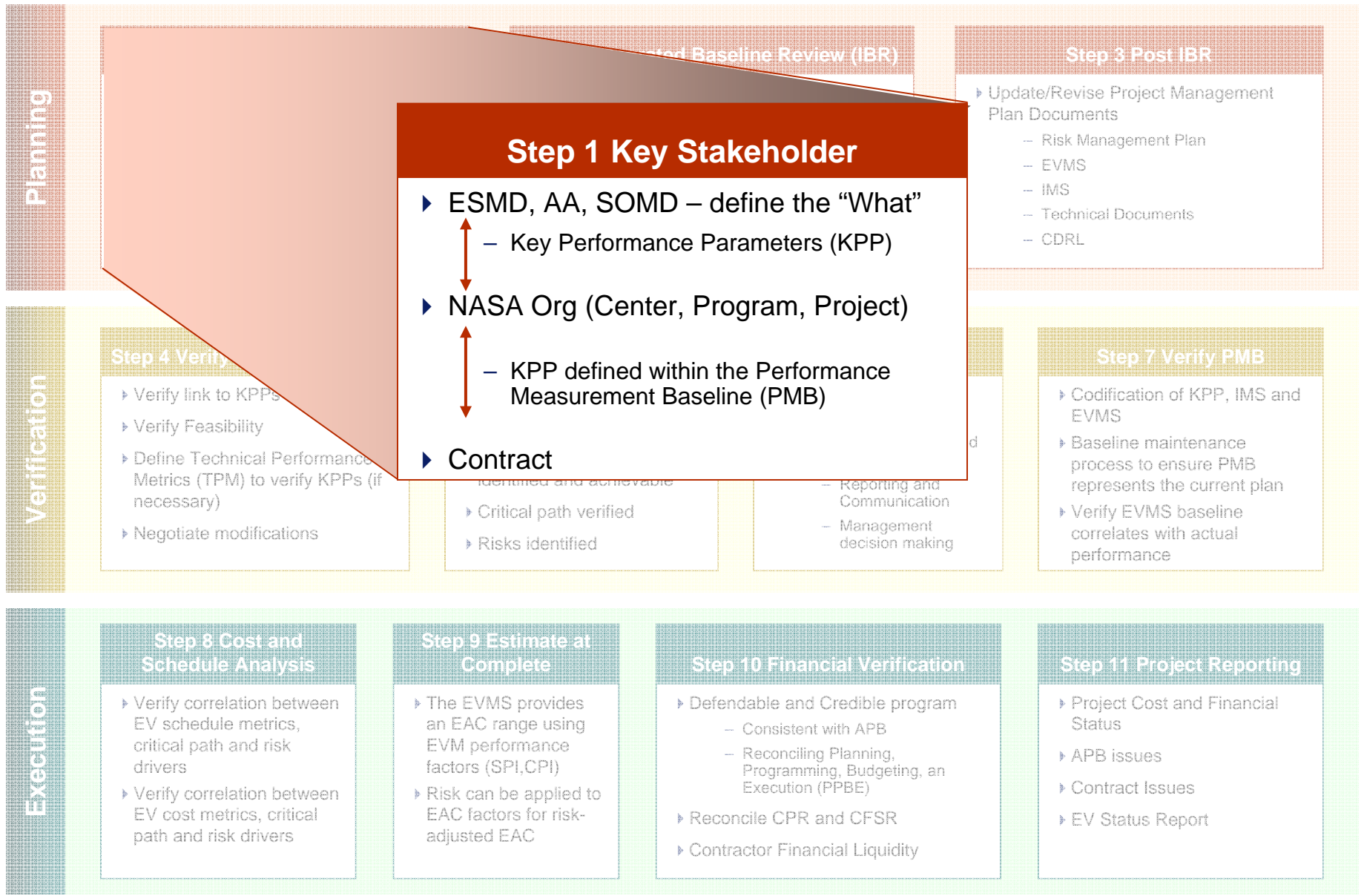
Step 10 Financial Verification

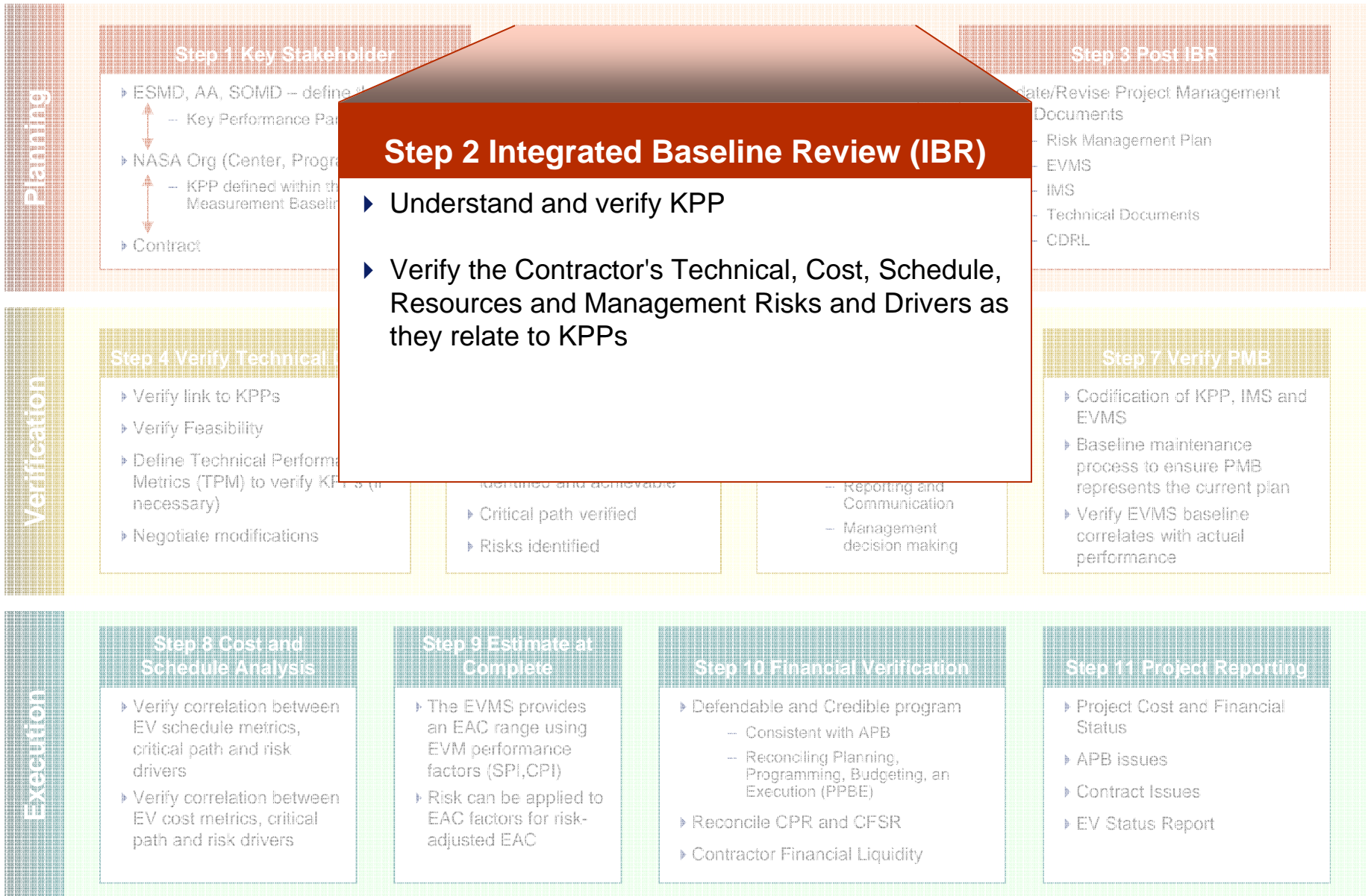
- ▶ Defendable and Credible program
 - Consistent with APB
 - Reconciling Planning, Programming, Budgeting, an Execution (PPBE)
- ▶ Reconcile CPR and CFRS
- ▶ Contractor Financial Liquidity

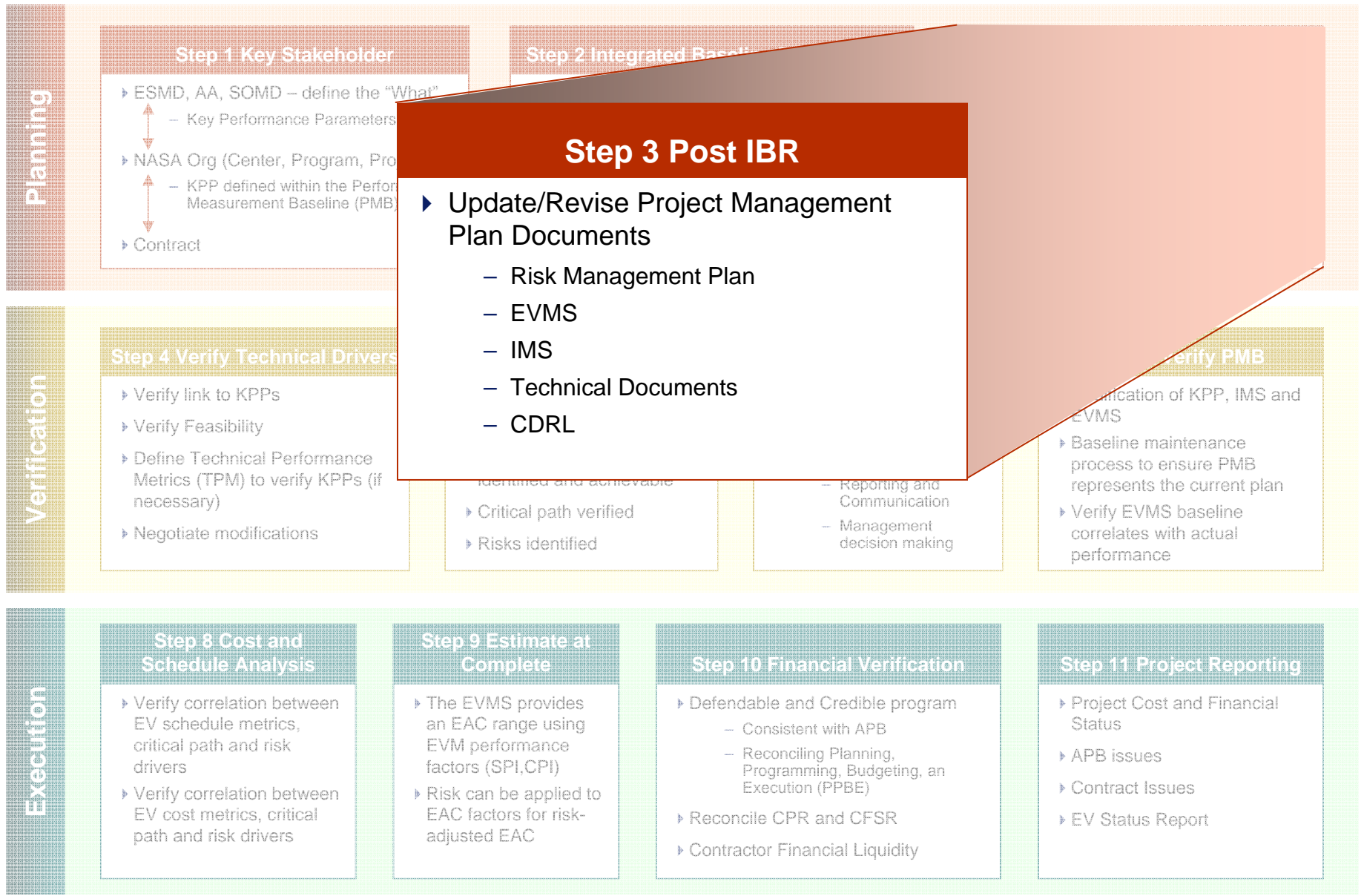
Step 11 Project Reporting

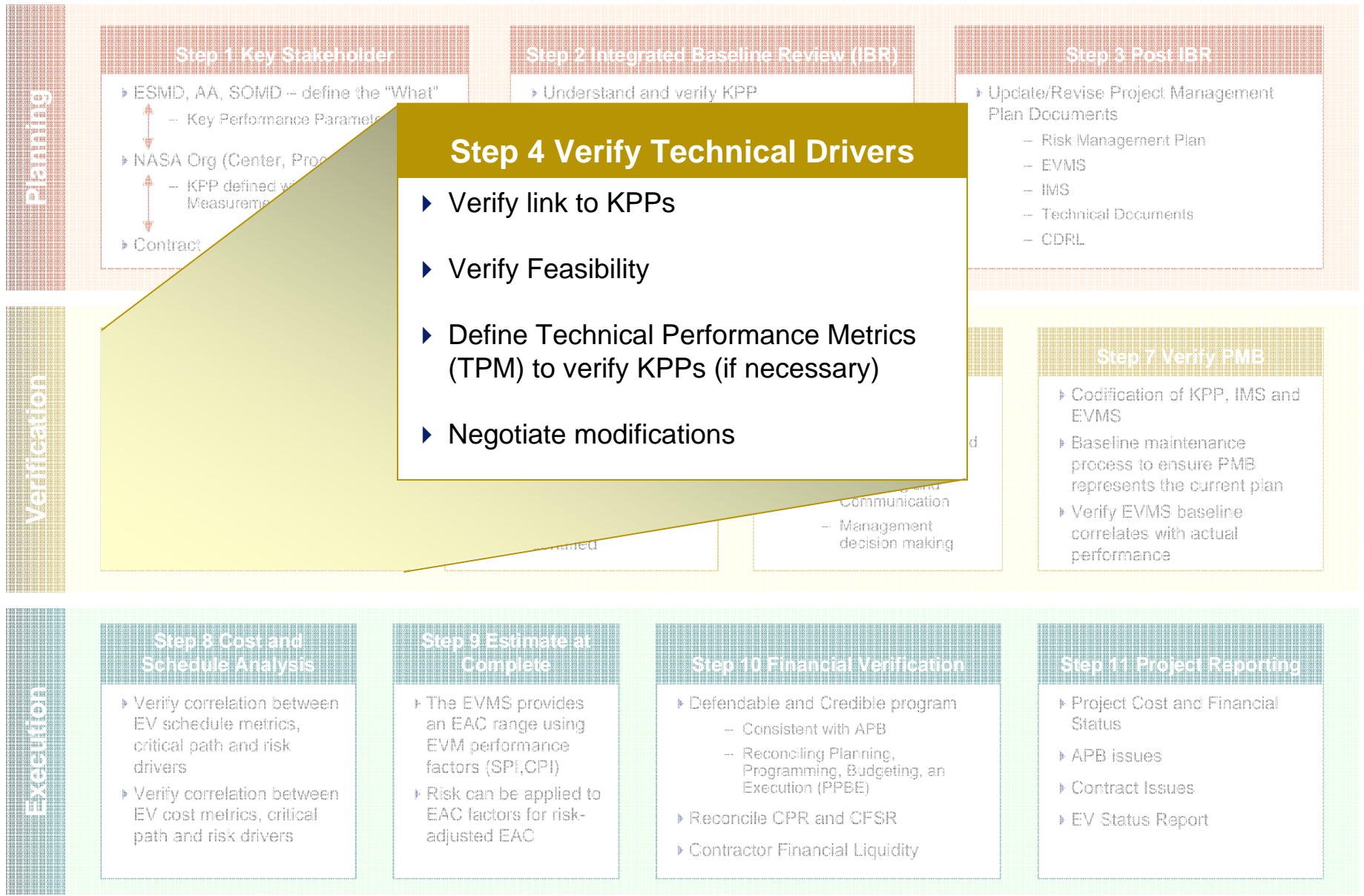
- ▶ Project Cost and Financial Status
- ▶ APB issues
- ▶ Contract Issues
- ▶ EV Status Report

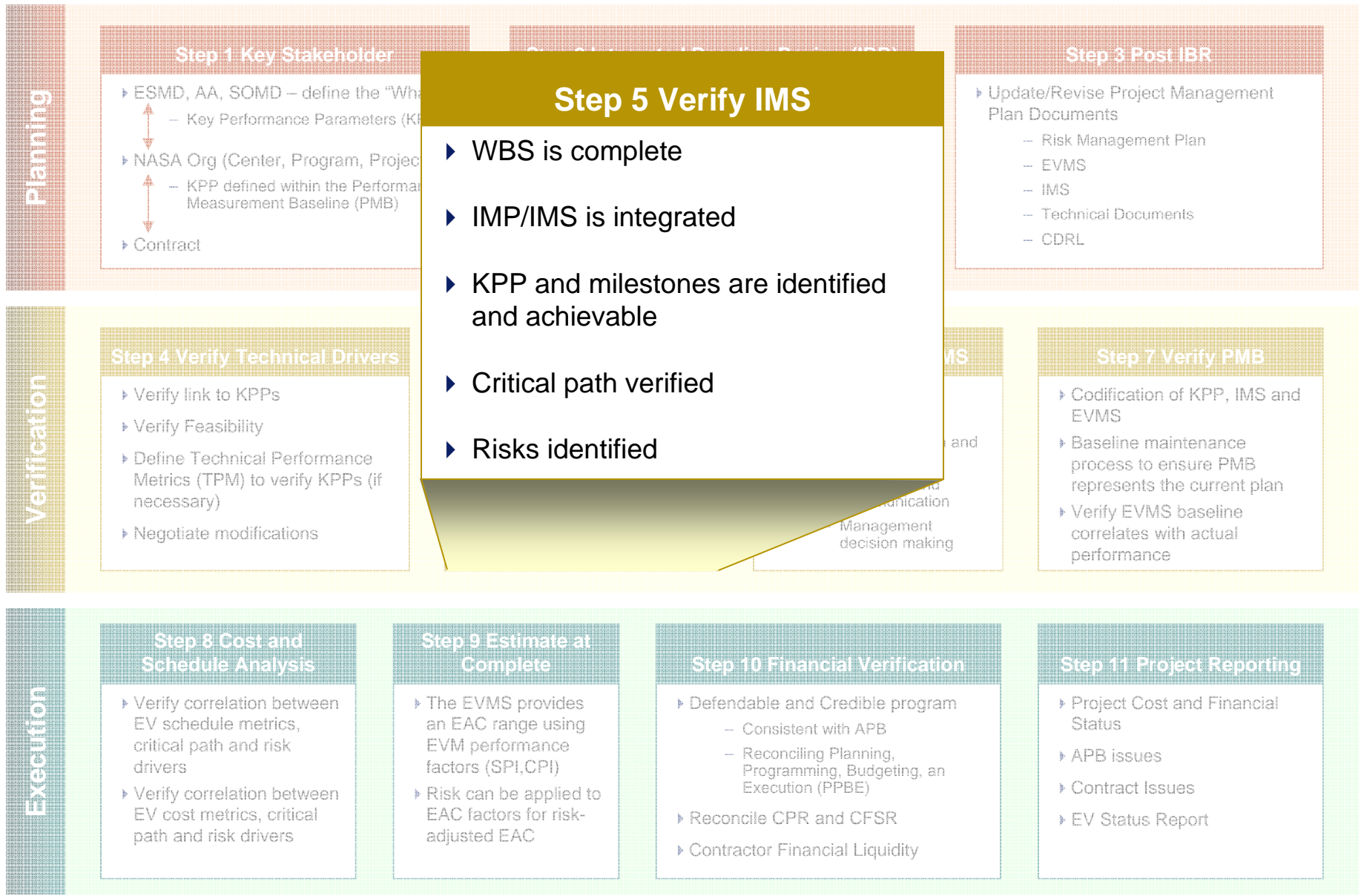


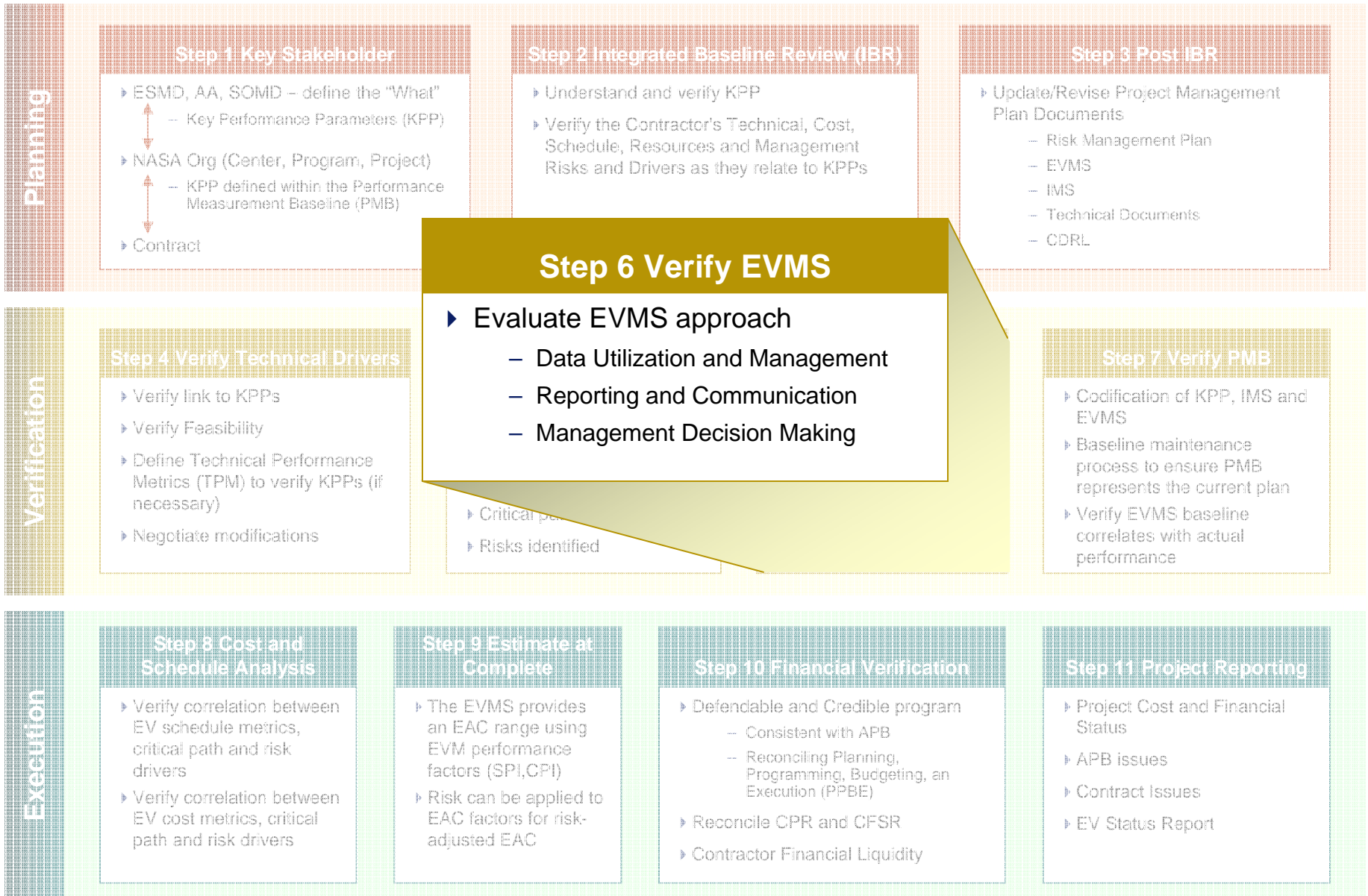


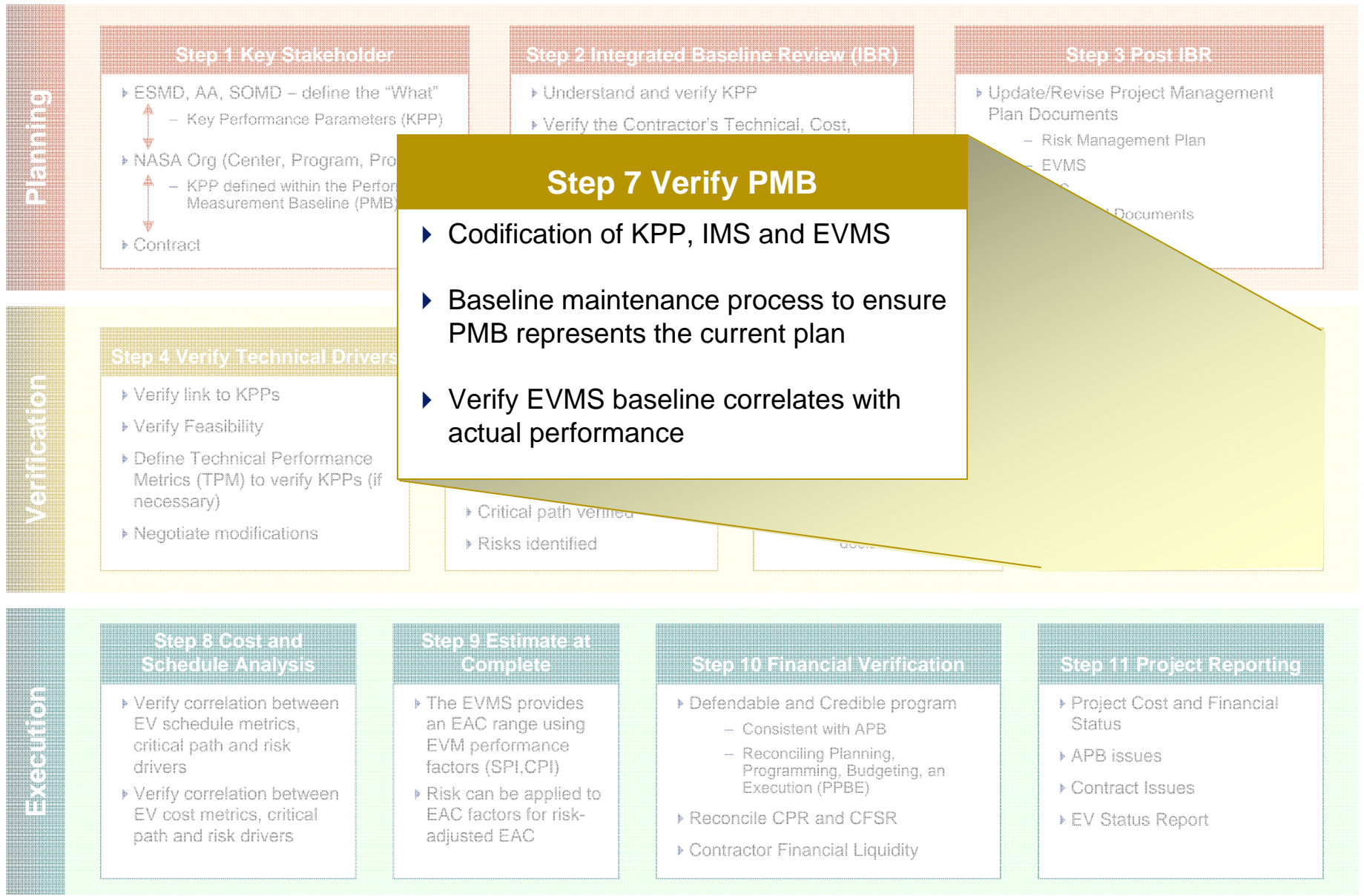


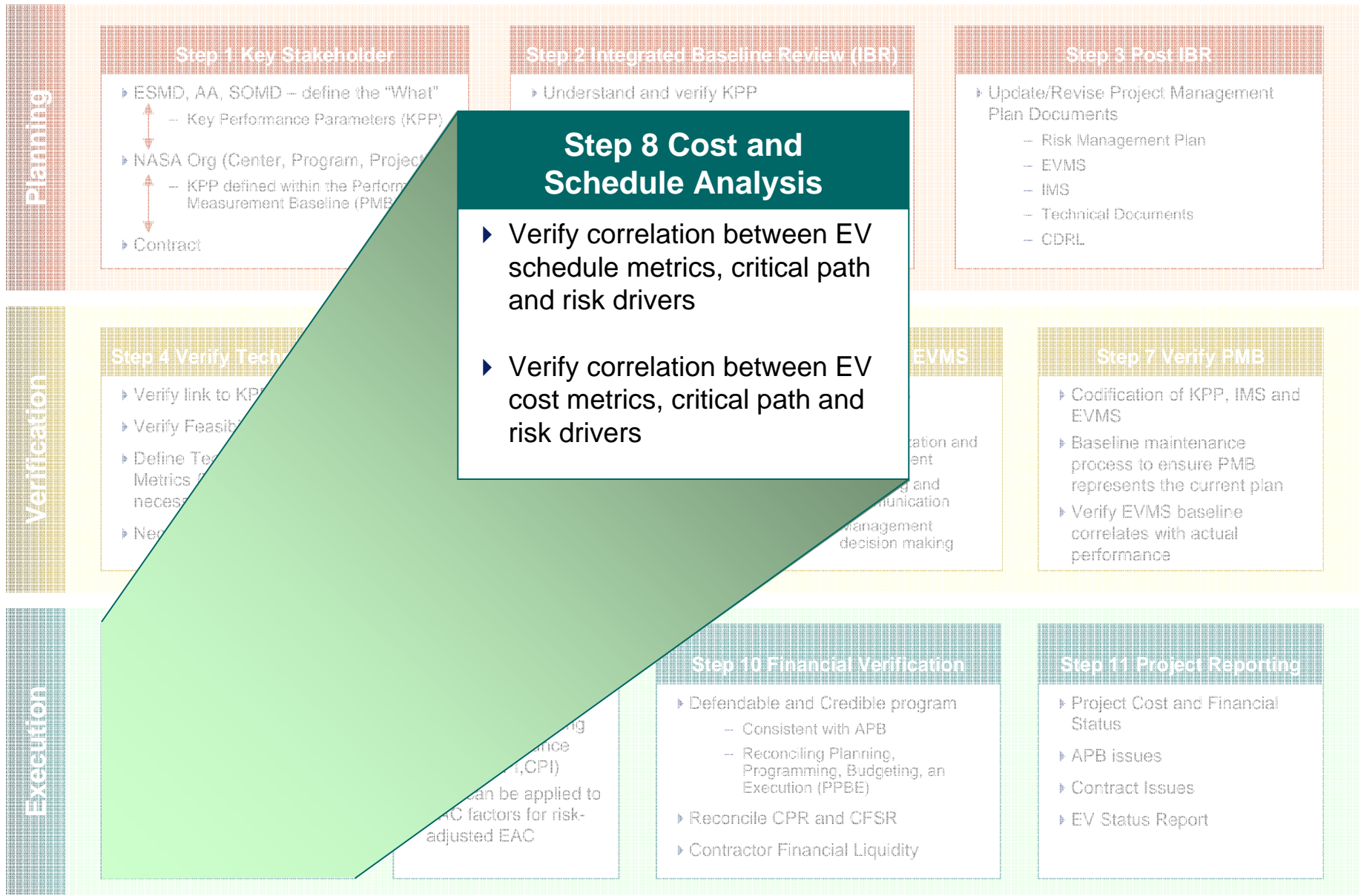


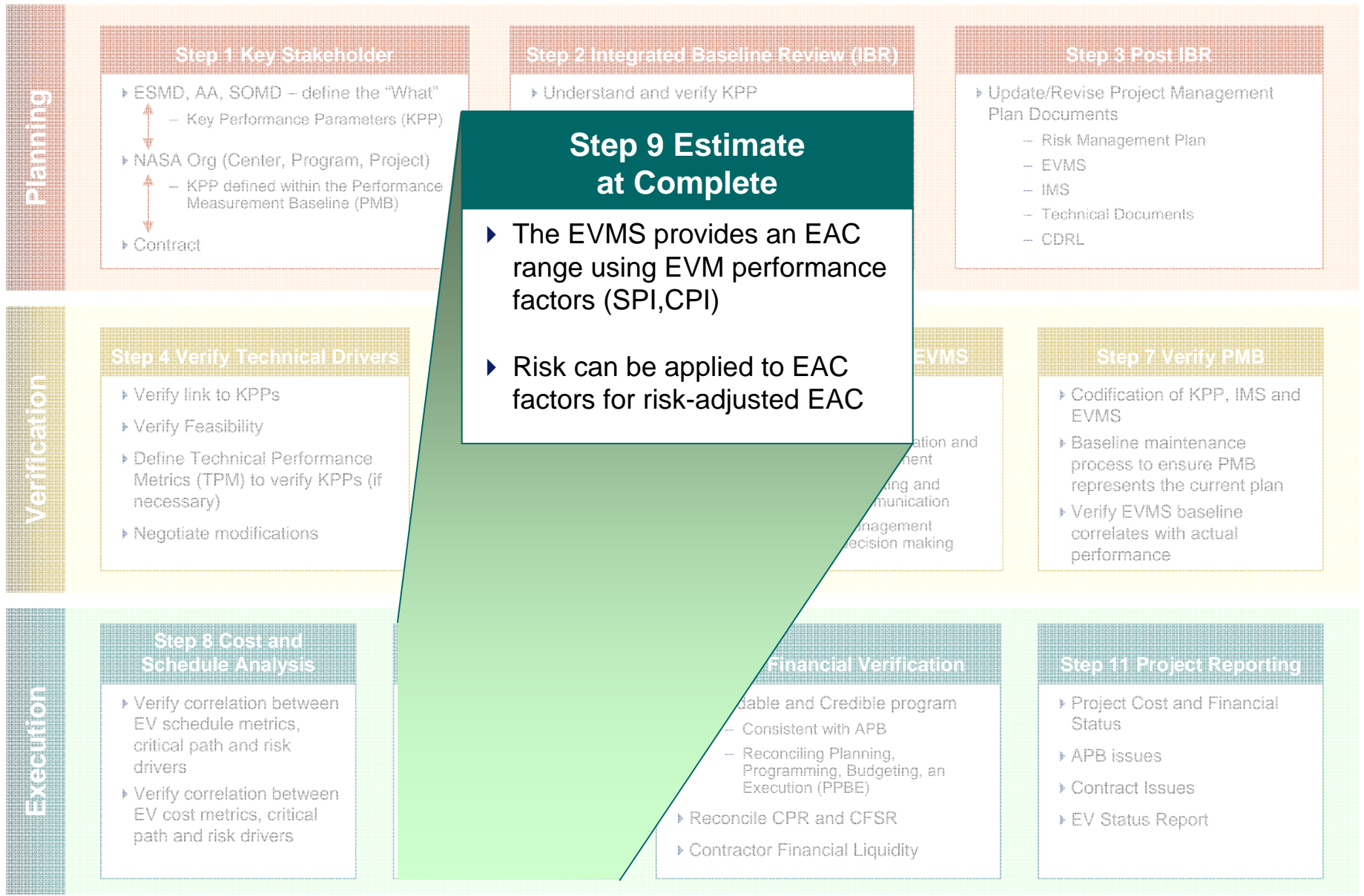


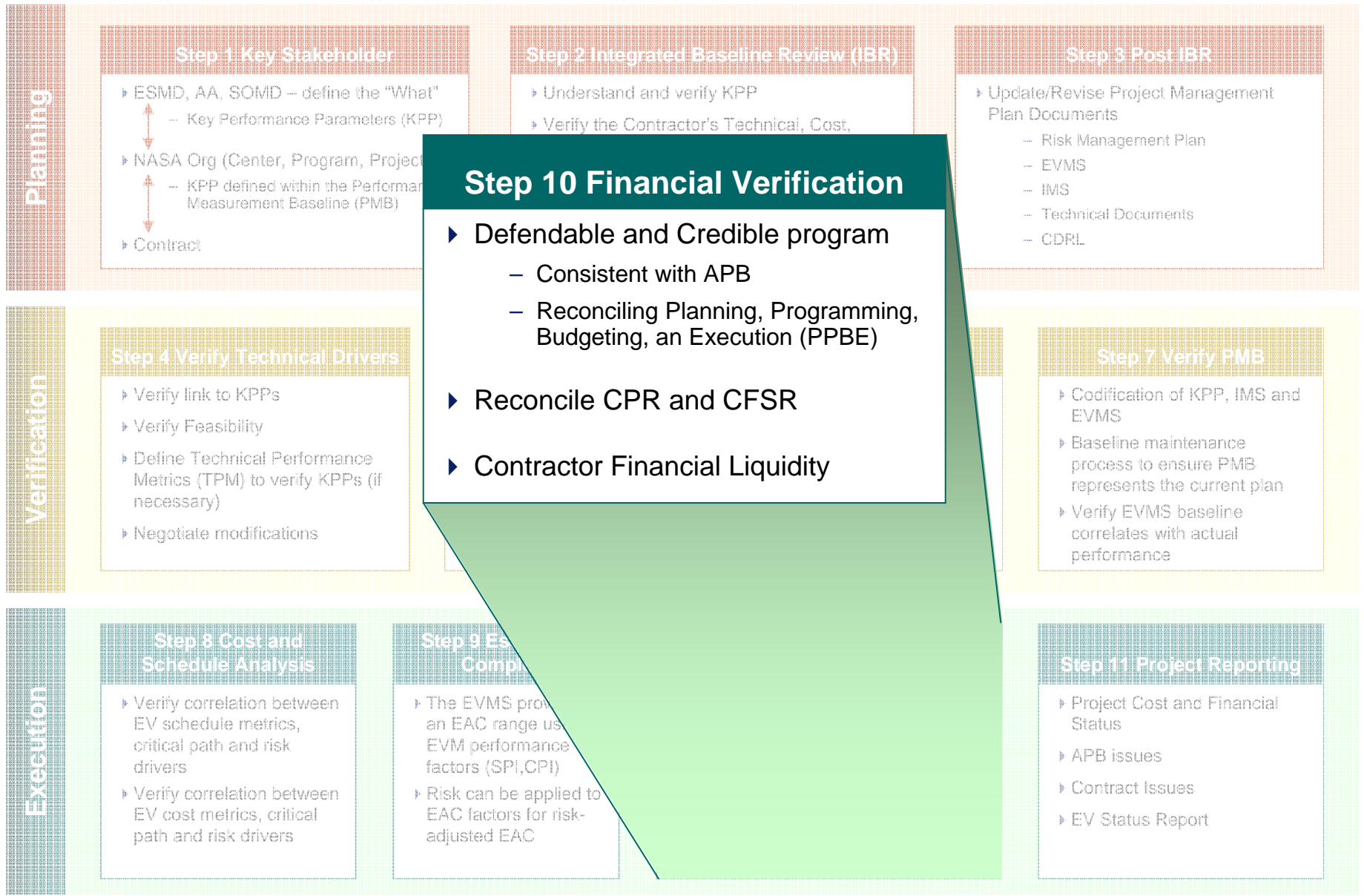


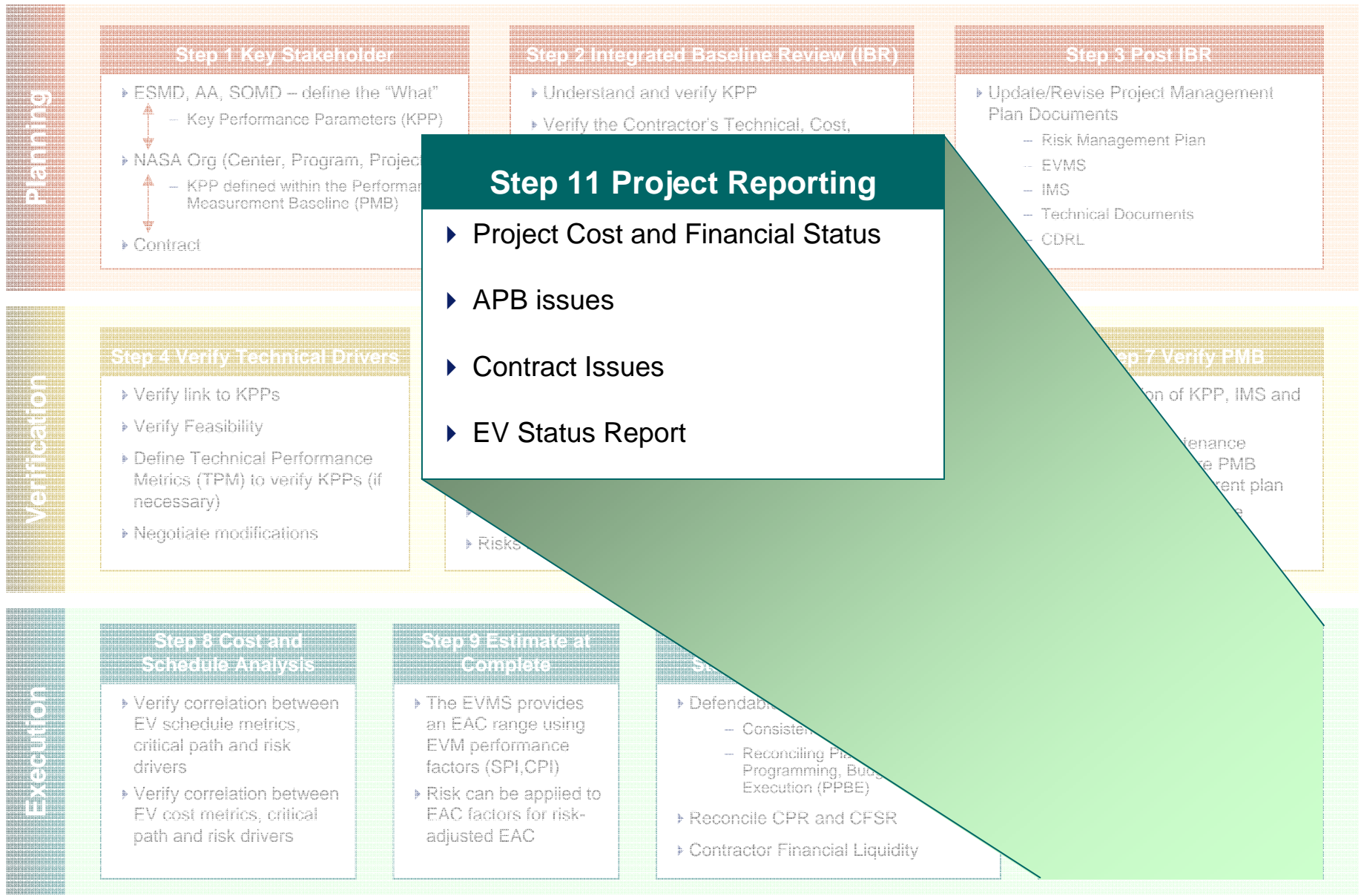












Questions/Comments

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