NSF Earned Value Management System (EVMS) Verifications

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Large Facilities Office (LFO)
Large Facilities Workshop
May 1-3, 2017

Outline

- Background
  - 2016 Large Facilities Workshop (LFW) EVMS session
- NSF Approach
  - NSF Oversight Tools
- “Pilot” EVMS Reviews
- NSF Process
  - Compliance Evaluation Review
  - Acceptance
  - Surveillance
- Summary

2016 LFW – EVMS Roundtable Session

- Inspector General (IG) Recommendations
  - Ensure the quality of EVM data
- Reviewed Various Federal Agency Practices
  - DMCA validation/certification (DOD, NASA)
  - Internal Validation/Certification Requirements
  - Third-party validations
  - Self & Peer validations
- Time and Money
- “Pilot” EVMS Review
  - Large Synoptic Survey Telescope (LSST)
- Path Forward: Decide whether NSF uses DCMA certification or it’s own version of written “acceptance & /approval”

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

OFFICE OF FEDERAL PROCUREMENT POLICY

October 23, 2015

MEMORANDUM FOR CHIEF ACQUISITION OFFICERS
SENIOR PROCUREMENT EXECUTIVES

FROM: Anne Rung
Administrator, Office of Federal Procurement Policy

SUBJECT: Reducing the Burden of Certifying Earned Value Management Systems

During last year's Open Dialogue on Federal Procurement, many stakeholders noted that reducing duplicative processes is one way to improve the efficiency and effectiveness of our acquisition practices.[1] For example, individual agency certification of contractors' Earned Value Managem
memoran

improve how agencies manage this process reciprocity.

Federal Acquisition Regulation Subpart 34.2 requires a contractor that receives an award for a major acquisition for development to have an EVMS that complies with the criteria in the American National Standards Institute/Electronic Industries Alliance (ANSI/EIA) Standard 748. Implemented properly, the EVMS will provide an early warning of cost overruns and schedule delays. However, the cost of certif
significant. Depending on the rigo

the cost of a certification can exceed $1 million.

hat achieves certification for its system at one
s having a compliant system and may be
required to complete yet another costly certification process.

NSF Approach - EVMS Verifications

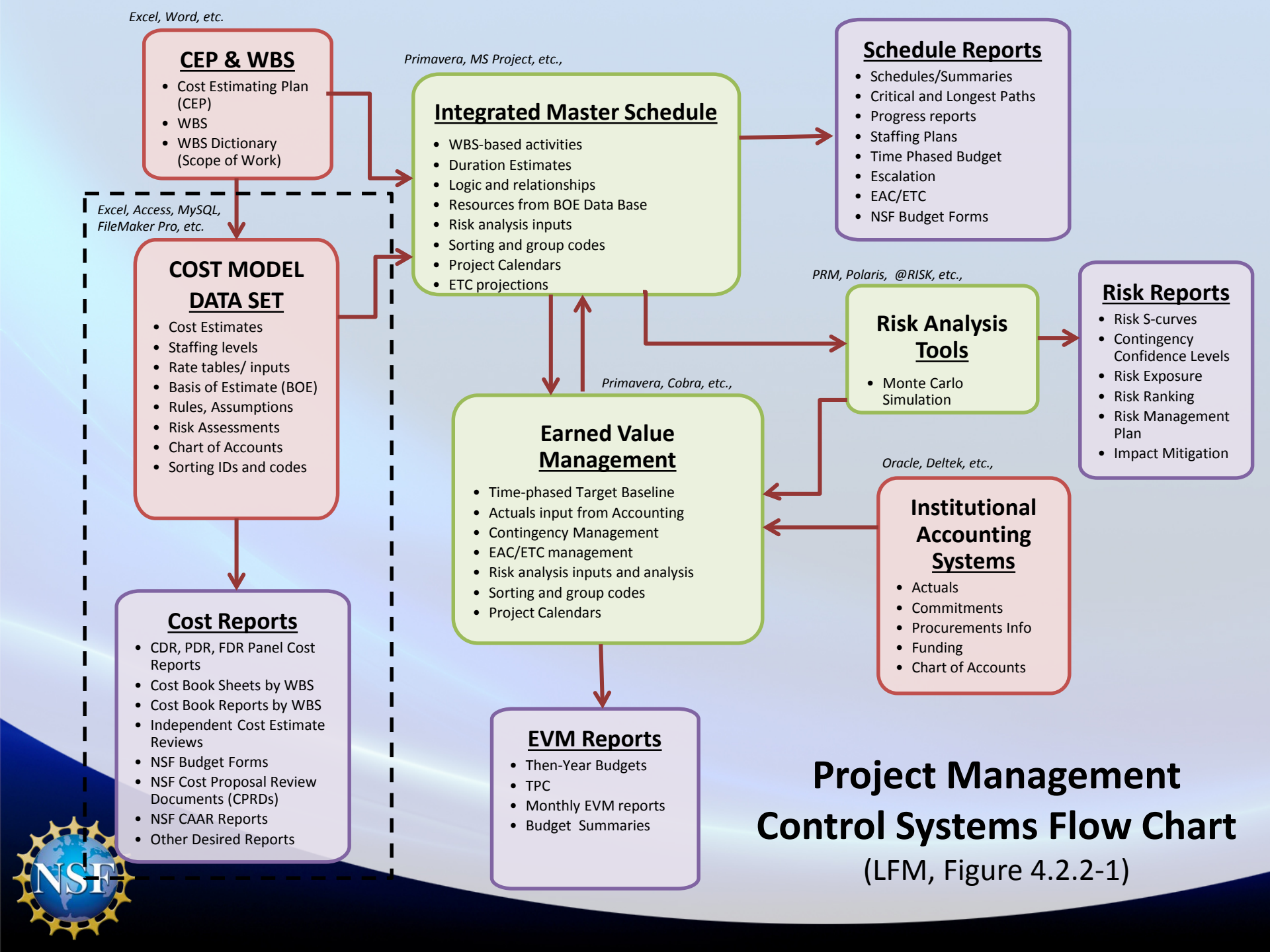
- National Defense Industrial Association (NDIA) EVMS Acceptance Guide
  - EIA-748 Standard 32 management guidelines
  - Tailored to NSF terminology & practices
- Independent Review Team
  - Lead by Large Facilities Office
  - External EVMS Expert(s)
- Focuses on the EVM specific systems
  - Does not perform in-depth review of the inputs
  - Utilizes the results from other NSF Oversight Reviews & Tools
- Project Oriented

Timely and Reliable Project Performance Data

NSF Various Oversight Tools*

- Expert Panel Review
  - Design: Concept, Preliminary, & Final
  - Construction and Operations: Annual
- Transition to Operations Review
- Monthly Reporting
- Cost Proposal Review & Analysis
  - Independent Cost Analysis
- Business Systems Review
- Accounting System Review/Audit
- Cost Incurred Audit

* More detail in Large Facilities Manual


Excel, Word, etc.
CEP & WBS
Cost Estimating Plan (CEP)
WBS
WBS Dictionary (Scope of Work)
Primavera, MS Project, etc.,
Integrated Master Schedule
WBS-based activities
Duration Estimates
Logic and relationships
Resources from BOE Data Base
Risk analysis inputs
Sorting and group codes
Project Calendars
ETC projections
Schedule Reports
Schedules/Summaries
Critical and Longest Paths
Progress reports
Staffing Plans
Time Phased Budget
Escalation
EAC/ETC
NSF Budget Forms
Excel, Access, MySQL, FileMaker Pro, etc.
COST MODEL DATA SET
Cost Estimates
Staffing levels
Rate tables/ inputs
Basis of Estimate (BOE)
Rules, Assumptions
Risk Assessments
Chart of Accounts
Sorting IDs and codes
PRM, Polaris, @RISK, etc.,
Risk Analysis Tools
Monte Carlo Simulation
Risk Reports
Risk S-curves
Contingency Confidence Levels
Risk Exposure
Risk Ranking
Risk Management Plan
Impact Mitigation
Primavera, Cobra, etc.,
Earned Value Management
Time-phased Target Baseline
Actuals input from Accounting
Contingency Management
EAC/ETC management
Risk analysis inputs and analysis
Sorting and group codes
Project Calendars
Oracle, Deltek, etc.,
Institutional Accounting Systems
Actuals
Commitments
Procurements Info
Funding
Chart of Accounts
Cost Reports
CDR, PDR, FDR Panel Cost Reports
Cost Book Sheets by WBS
Cost Book Reports by WBS
Independent Cost Estimate Reviews
NSF Budget Forms
NSF Cost Proposal Review Documents (CPRDs)
NSF CAAR Reports
Other Desired Reports
EVM Reports
Then-Year Budgets
TPC
Monthly EVM reports
Budget Summaries
Project Management Control Systems Flow Chart
(LFM, Figure 4.2.2-1)

CEP & WBS

- Cost Estimating Plan (CEP)
- WBS
- WBS Dictionary (Scope of Work)

Schedule Reports

- Schedules/Summaries
- Critical and Longest Paths
- Progress reports
- Staffing Plans
- Time Phased Budget
- Escalation
- EAC/ETC
- NSF Budget Forms

Integrated Master Schedule

- WBS-based activities
- Duration Estimates
- Logic and relationships
- Resources from BOE Data Base
- Risk analysis inputs
- Sorting and group codes
- Project Calendars
- ETC projections

Expert Panel Review Focus

COST MODEL
DATA SET

- Cost Estimates
- Staffing levels
- Rate tables/ inputs
- Basis of Estimate (BOE)
- Rules, Assumptions
- Risk Assessments
- Chart of Accounts
- Sorting IDs and codes

Cost Reports

- CDR, PDR, FDR Panel Cost Reports
- Cost Book Sheets by WBS
- Cost Book Reports by WBS
- Independent Cost Estimate Reviews
- NSF Budget Forms
- NSF Cost Proposal Review Documents (CPRDs)
- NSF CAAR Reports
- Other Desired Reports

Risk Analysis Tools

- Monte Carlo Simulation

Risk Reports

- Risk S-curves
- Contingency Confidence Levels
- Risk Exposure
- Risk Ranking
- Risk Management Plan
- Impact Mitigation

Cost Proposal Review & Analysis

- Expert Panel Reviews
- Independent Cost Analysis
- Contingency Analysis
- Indirect Costs, Financial Viability

(LFM Figure 4.2.1-1)

- **Business Systems Review**
- **Accounting System Review/Audit**
- **Cost Incurred Audit**

Institutional Accounting Systems

- Actuals
- Commitments
- Procurements Info
- Funding
- Chart of Accounts

EVMS Verification Focus

Earned Value Management

- Time-phased Target Baseline
- Actuals input from Accounting
- Contingency Management
- EAC/ETC management
- Risk analysis inputs and analysis
- Sorting and group codes
- Project Calendars

EVM Reports

- Then-Year Budgets
- TPC
- Monthly EVM reports
- Budget Summaries

Results from:

- Preliminary & Final Design Review Reports
- BSR Reports
- Cost Proposal Review

Additional “Pilot” EVMS Reviews

Daniel K. Inouye Solar Telescope (DKIST)

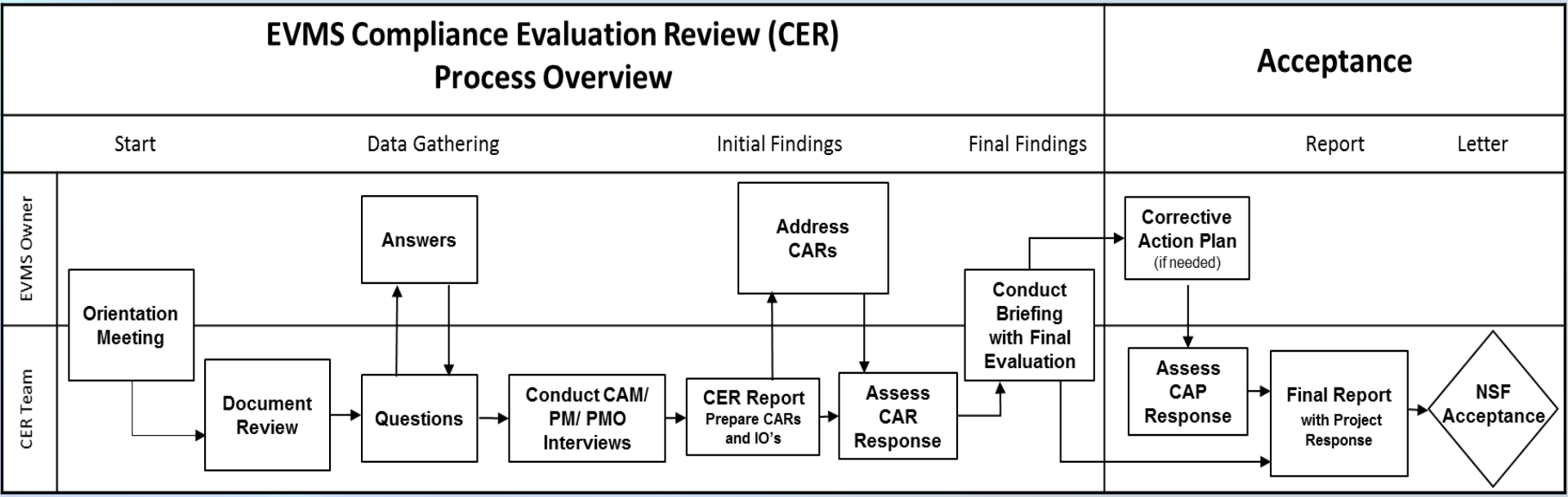
- Under Construction
- Compliance Evaluation & Surveillance Review
- Periodic Estimates at Completion (EAC) – aligned with Large Facilities Manual (LFM) to include update risk exposure
- Indirect Costs – variable at lower levels including down to work packages

Regional Class Research Vessel (RCRV)

- Final Design Review
- Compliance Evaluation Review
- Most of scope - Firm-fixed price contract with Shipyard
- Delayed acceptance after Shipyard is incorporated into the EVMS processes.
- Indirect Costs - fixed

Finalization of EVMS Standard Operating Guidelines (SOG) and LSST & DKIST EVMS Acceptance – Closure of IG Recommendations

NSF EVMS CER & Acceptance Flowchart



- Initiated during Final Design
- 4 – 8 Months
- Acceptance by Head, LFO
- Prior to Construction Funding

Abbreviations:

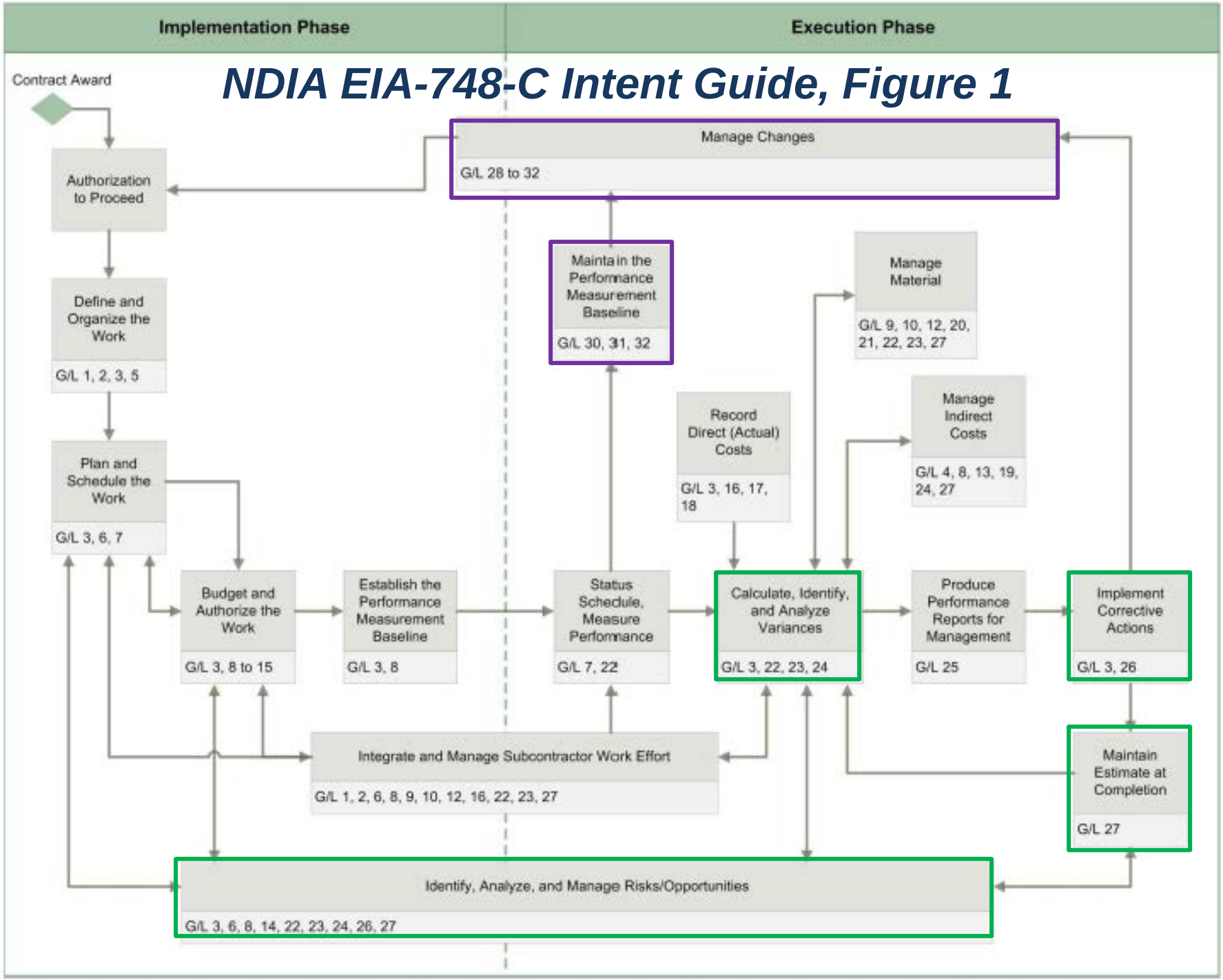
- *CAR – corrective action request*
- *IO – improvement opportunity*
- *CAP – corrective action plan*

Compliance Evaluation Review (CER)

EIA-748 32 Guidelines in 5 Categories

- Organization (*guidelines 1-5*)
  - Define & organize the work
- Planning, Scheduling and Budgeting (*guidelines 6-15*)
  - Develop & establish the performance baseline
- Accounting Consideration (*guidelines 16-21*)
- Analysis and Management Reports (*guidelines 22-27*)
  - Identify & analyze variances
  - Corrective actions
  - Manage risks
- Revisions and Data Maintenance (*guidelines 28-32*)
  - Manage changes
  - Maintain performance baseline

NDIA EIA-748-C Intent Guide, Figure 1



Guidelines Tailored to Large Facilities Manual (LFM)

- Guideline 1: No co-mingling of funds (*LFM 3.4*)
- Guideline 9: Identification of NSF cost category elements (*LFM 4.2*)
- Guideline 14: Identify cost and schedule contingency budget per LFM 4.2 and 5.2
- Guideline 15: No management reserve & contingency held separately from the baseline (*LFM 4.2.5.1)*
- Guideline 26: CPI & SPI variances greater than 10% requires submission of recovery plan to NSF (*LFM 4.5.4*)
- Guideline 27: Periodic ETC with updated risk exposure (*LFM 4.2.5.8 & 5.2.11.4*)
- Guideline 28: Incorporate changes per award instrument (*LFM 4.2.5.5 & 5.2.11.2*)
- Guideline 32: Maintain change log and provide all change request to NSF (*LFM 4.2.5*)

CER Report Format - sample

Guideline - EIA-748-C	NSF-Adjusted Guideline Description	Intent Met? High-Green Medium-Yellow Low-Red	References Project Procedure/ Document/ Interview	Observations/Comments/Findings
2.5d Prevent unauthorized changes	31. Prevent revisions to the project budget except for authorized changes.	High	•Contingency Management Plan – PEP App 6.3 •Configuration Control Plan - PEP Section 8 & App 8.1 •Financial Reporting Plan – PEP App 10.4 •Contingency Database •Interviews	•RCRV has a well-defined change control process, with prescribed approval levels, which RCRV uses for revisions to project budget and schedule. •Budget approval thresholds have been established. •Thresholds for approvals have not been established for schedule nor scope. •The Contingency Database program integrated with the Shipyard Office, Accounting, and Procurement is a best practice. The system is a new program and the readiness of staff to use it was not assessed. The assessment of the program implementation will be done during the first surveillance review.
2.5e Change documentation and reporting	32. Document change requests and the resultant changes to the performance measurement baseline. Maintain a change log and provide all change requests to NSF. (LFM section 4.2.5)	High	•Configuration Control Plan - PEP Section 8 & App 8.1 •Contingency Management Plan – PEP App 6.3 •Financial Reporting Plan – PEP App 10.4 •Contingency Database •Interviews	•RCRV has a well-defined web-based change control process that will be utilized by the Shipyard Representative's Office and the RCRV Project office, with prescribed approval levels, which RCRV uses for revisions to the project budget and schedule. •Change log is generated from the contingency database.

Medium: Non-critical aspects of guideline not met

Low Red: Critical aspects of guideline not met

EVMS Surveillance Reviews

- During the Construction Stage
  - Accepted EVMS is being maintained and followed
  - Combined with verification if NSF acceptance not in place
- Part of the Annual Reviews
  - May be different frequency if determined beneficial
- Does not include a complete compliance check of the 32 guidelines
- Targeted surveillance reviews
  - Corrective actions,
  - New procedures, and/or
  - Demonstration of practice

Summary

- Verification vs Validation/Certification
  - Assess system reliability
- Focuses on EVMS Systems and Processes
  - Utilizes Results from other Oversight Tools
- Lead by NSF Large Facilities Office
- NSF Acceptance
  - EVMS effectively implemented
  - Reliable project management information