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"State-of-the-Standard"

A Focus on Challenge and Change

A Presentation for the National Defense Industrial Association
Integrated Program Management Division
September 13, 2017

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Overview

- EVMS Health Challenges
- Schedule Execution Metrics
- Refocused IBR Approach

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EVMS Health Challenges

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What We're Seeing

- Government Focus Areas
  - Considering updates to policy and regulation
  - Reviewing options to update compliance framework, summary health assessments, and independent reviews
  - Changing nature of inter-governmental communications, support, and reliance
  - Challenges with Industry out-reach
  - Maintaining, growing and grooming a skilled workforce
- Industry Focus Areas
  - Commitment, investment, capabilities and discipline
  - Perceptions of compliance and definitions of EVMS
  - Trends in EVMS health: Command media, program implementation challenges, and aging CARs
  - Tools that challenge…or trump…understanding
  - Program Control…what was once, is no more
  - Focus on independent reviewers vs. program implementation
  - Root cause analysis and corrective/preventative actions

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Schedule Execution Metrics

Earlier Warning, Quicker Recovery, and Improved Accountability

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How Schedule Execution Metrics Helps both Industry and Government

The suite of Schedule Execution Metrics tells a more complete story

- Provides feedback to the planning process
  - Is the work really being performed as it was planned? How much can the plan deviate and still be useful as a plan (use of float, margin)?
- Identifies upcoming planning challenges
  - Are future activities in jeopardy of finishing late? Is there a bow wave of activities on he horizon?
- Highlights issues that are not necessarily identified by technical metrics
  - How much effort is regularly being spent on activities that are already more than 30d late?
- Supplements typical schedule presentation
  - Is accomplishment of tasks supporting the standard Gantt Chart view? Is there a potential impact to the critical path?

Challenges in Typical Schedule Reporting

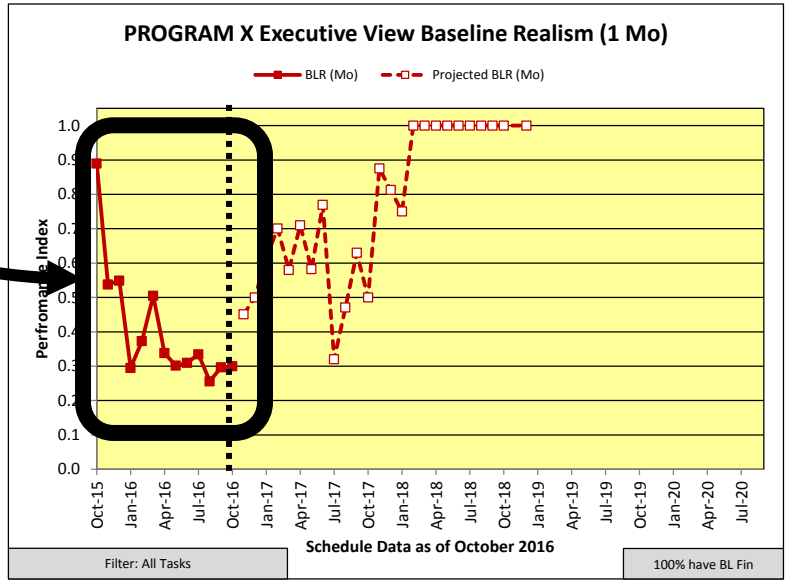
Typically EVM Metrics provided to Senior Leadership

	SV	CV	VAC
Program Level	↑	↑	↔
BUS	↑	↑	↑
PAYLOAD	↑	↑	↑

Notional Data

EVM vs SEM

Schedule Execution Metrics can provide Additional Insight



Notional Data

Program-level Cumulative *Schedule Variance* can look favorable, even if there are execution challenges:

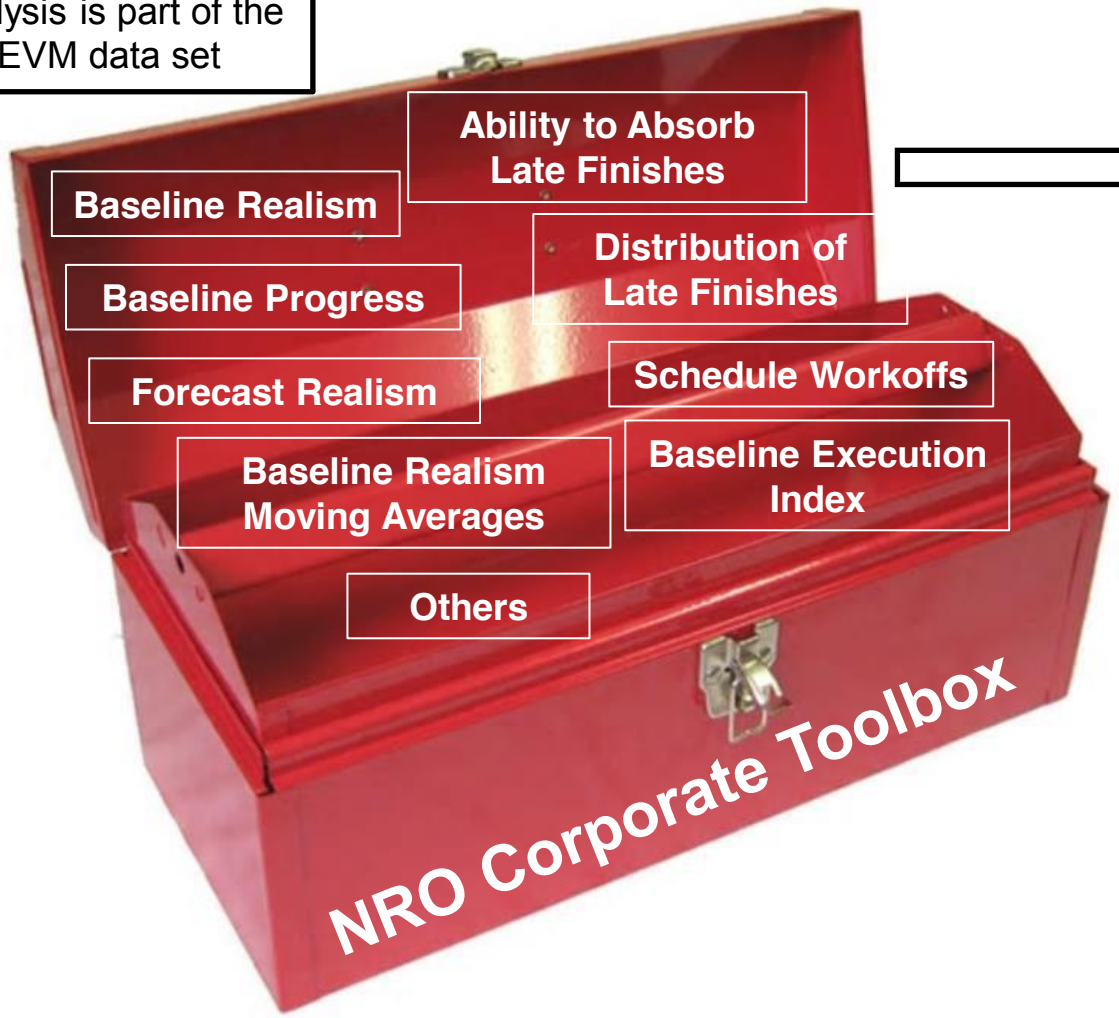
- Historic performance can heavily weight the indicator to "green"

Baseline Realism can provide an early indicator that a contractor is not performing the work as planned

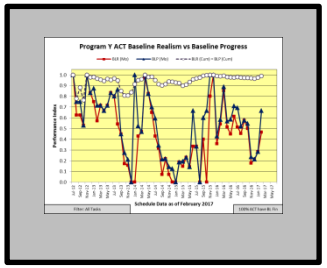
Senior Leaders ask for leading indicators of execution challenges

Schedule Execution Metrics as part of the NRO Corporate Toolbox

Schedule data and analysis is part of the EVM data set



Baseline Realism is one of many metrics that can be used to assess schedule performance

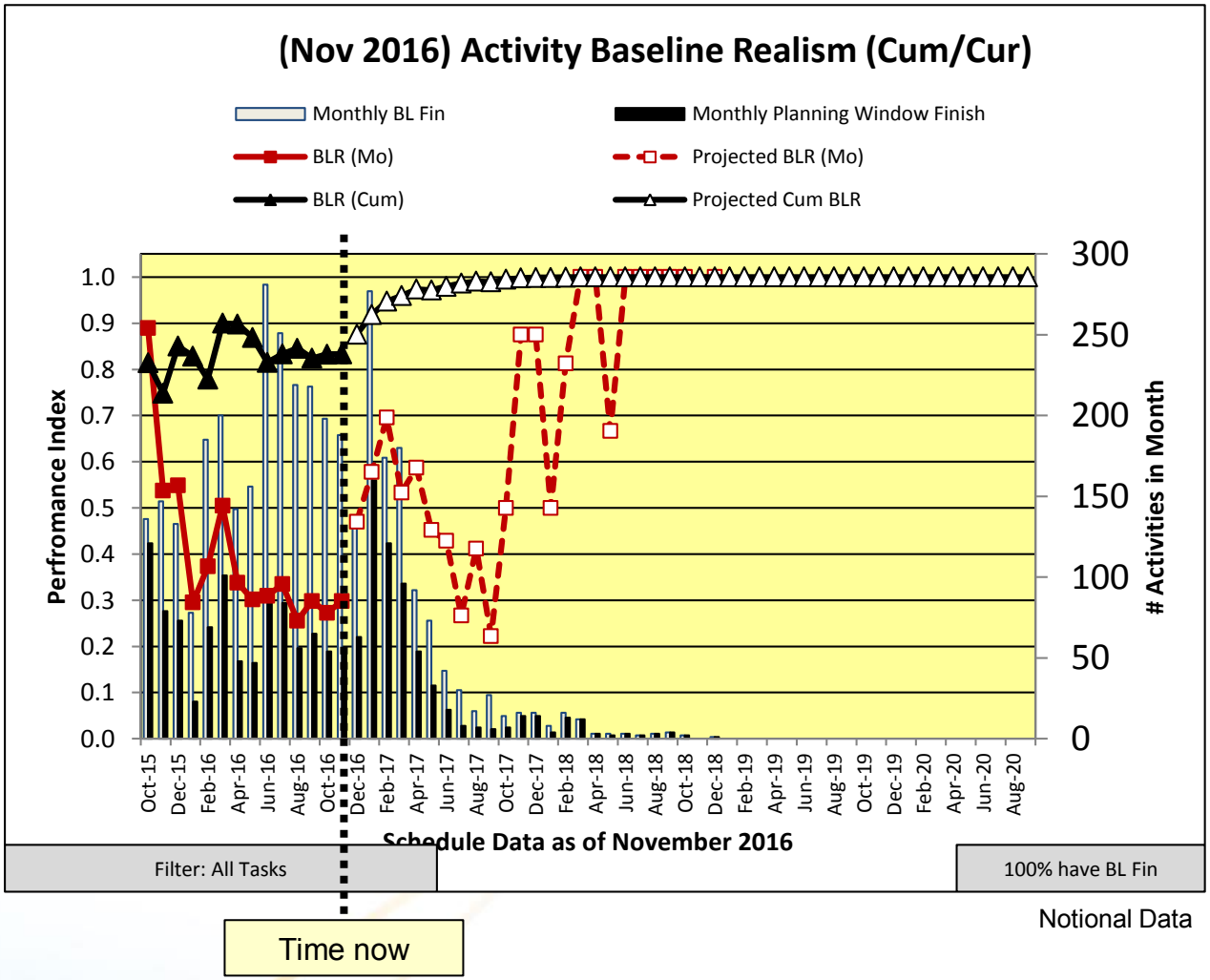


We recommend a combination of new and existing Schedule Execution Metrics to answer 3 critical questions

Question	Metric/Analysis	What it Means
Is the contractor executing the baseline plan?	Baseline Progress	*Prior to "time now" Activities completed early or on time / baseline activities planned finishes over a specified period of time* *After "time now" Activities forecasted early or on time / baseline activities planned finishes over a specified period of time*
	Baseline Realism	*Prior to "time now" Assessment of the completions of specific baseline plan finishes over a specified period of time* *After "time now" Assessment of the forecasted completions of specific baseline plan finishes over a specified period of time*
Is the contractor ahead or behind?	Critical Path Verification	*Identification of Critical Path activities to any specific deliverable or milestone*
	Critical Path Length Index	*(Duration to a specific deliverable or milestone + float and margin) / duration to a specific deliverable or milestone*
	Schedule Margin Remaining	*Schedule margin as percentage of remaining time to a deliverable or milestone*
Is the forecast realistic?	Forecast Realism	*Prior to "time now" Number of tasks actually completed / number of tasks forecasted to finish in a previous IMS version of the IMS* *After "time now" Number of tasks forecasted to complete / number of tasks forecasted to finish in a previous IMS version of the IMS*
	Schedule Work-off	*Prior to "time now" Percentage of activities completed each month that are more than 30 days late* *After "time now" Percentage of activities in the future that are forecasted to be more than 30 days late*
	Total Float Consumption Index	*(Actual Duration + Critical Path Total Float) / Actual Duration*

Note: One or more specified period of time can be one to six months, or a cumulative value

Interpreting Baseline Realism



Light Blue Bars represent the count of activity baseline finishes

Prior to Time Now - **Black Bars** represent actual activity finishes

After time now – **Black Bars** represent forecasted activity finishes

Solid Red Line represents the percent of activity completions in the period they were baselined for completion

Dotted Red Line represents percent of activity completions forecasted to complete in the period they are baselined to be completed

Solid Black Triangles represent Cumulative Baseline Realism (percent)

White Triangles represent Forecasted Cumulative Baseline Realism (percent)

NRO Schedule Execution Metric Capabilities

- Schedule Execution Metric methods are documented and have been presented over the last 6 months at NRO Scheduler's Forum
  - Terminology has been Branded
  - Formulas have been vetted
  - Charts have been presented to senior management
- NRO Earned Value Center of Excellence (ECE) has developed tools automated calculation
- ECE is currently working to benchmark Schedule Execution Metrics to better interpret results with respect to historical experience
- ECE is encouraging COTS vendors to consider incorporating Schedule Execution Metrics into IMS and IPMR Analysis Tools

Ongoing Research to Interpret Metrics

- What level or trend in Baseline Realism is an early indicator of an OTB?
- Can Baseline Progress values less than a certain value be regularly associated with an overrun or use of schedule margin?
- What is an expected benchmark for Forecast Realism?

Factors to Consider

- Space Hardware versus Ground Software (in the Space and Ground community)
- Use of Schedule Margin, Management Reserve
- Follow-on effort versus New Development

Integrated Baseline Review (IBR)

Refocusing on Achievability

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What is an IBR?

The Review

A Government program manager led review to ensure the Contractor's baseline plan has:

- Adequate scope of work & definition;
- Realistic schedule;
- Adequate skill mix & sufficient resources;
- Objective performance measurement indicators to measure work accomplishment
- Sufficient management reserve and schedule margin to mitigate future known and unknown risks[1]

The Outcome

Baseline Declaration:

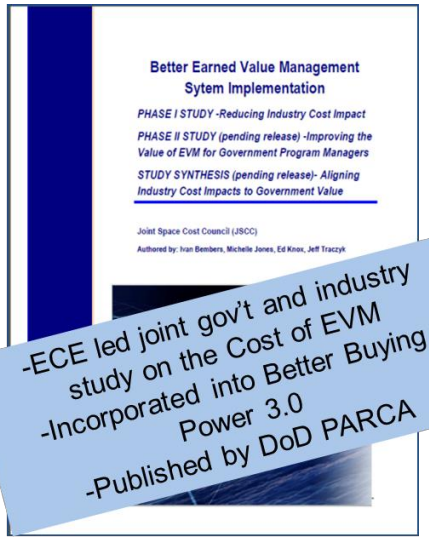
- ☑ The baseline is achievable
- ☐ The baseline is not achievable
- ☐ Baseline achievability cannot be determined

Why wouldn't all programs use this IBR approach? (DNRO 12/15/16)

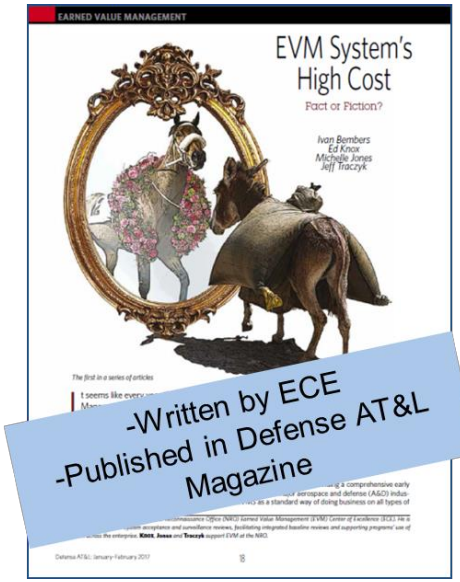
1. NRO IBR Team Handbook, Reference r.

The Impetus for Change

- JSCC Better EVM Implementation Study:
  - The Joint Space Cost Council Better EVM Implementation Study recommendations prompted the CAAG/ECE to refocus the IBR Process across the NRO
  - After preliminary reviews, the CAAG/ECE came to the same conclusion of the JSCC study that recent IBRs were **process reviews** and **data integrity checks** rather than technically focused reviews to assess baseline achievability of cost, schedule and performance contract objectives
- NRO Refocused IBR Pilots:
  - The JSCC study and IBR pilot feedback revealed that NRO program managers already highly value the IBR
  - The IBR pilot success proved to be an enterprise opportunity to improve advance warning of future program execution risk



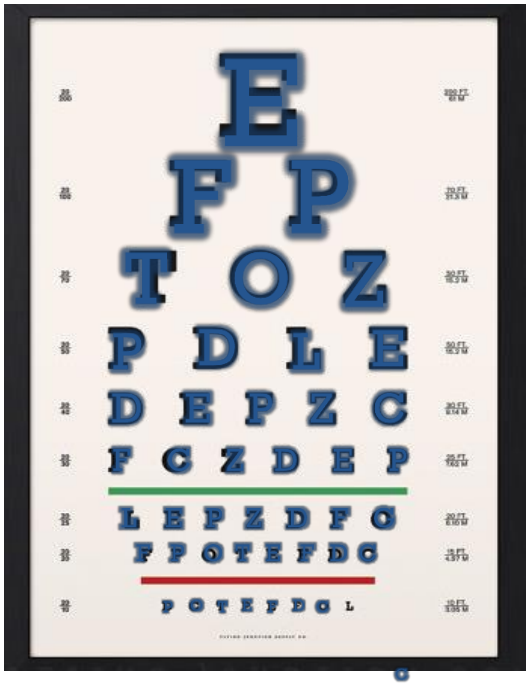
-ECE led joint gov't and industry study on the Cost of EVM
-Incorporated into Better Buying Power 3.0
-Published by DoD PARCA



-Written by ECE
-Published in Defense AT&L Magazine

We're Refocusing on Achievability

- NRO's refocused IBR initiative puts 9 industry-accepted project management constraints[1] at the center of the IBR
  - Scope
  - Time
  - Budget
  - Resources
  - Quality
  - Risk
  - Procurement
  - Project Integration
  - Customer Relations



- The overarching goals are to focus on baseline achievability, enhance involvement of NRO's technical community and hold the PM/COTR accountable for delivering on contract requirements

1 Adapted from – Kerzner, Harold, Project Management, A Systems Approach to Planning, Scheduling, and Controlling, 6th edition; Project Management Institute, Project Management Body of Knowledge, 5th edition; Crawford, J. Kent, Project Management Maturity Model, Providing a Proven Path to Project Management Excellence, 2002,

(U) IBR Pilot Results

IBR Results provide insight into program risks and constraints

- While the program execution is **likely to be successful**, the **OTB / re-plan is not achievable** due to insufficient budget
- The PMB **may be achievable** with the following risks…
- The Government has **low confidence that the baseline is achievable** given the remaining period of performance left on the base
- Program planning to date supports initial contract milestone. However, integrating the software master build plan with program **planning artifacts is needed before PMB achievability can be fully demonstrated**
- The **initial PMB has not been fully integrated** and matured based on information provided. The Government does not have adequate insight into the sufficiency of MR for known and unknown risk

Refocused IBR Pilot Feedback from NRO Program Managers:

- *"This was the best IBR I've been on in the past several years."*
- *"The need for the COTR to decide on the achievability of the baseline made the IBR a meaningful review."*
- *"The refocused IBR is no longer an EVM process review."*

Pilots were a major breakthrough in refocusing the IBR as a technical review across the NRO

Questions?

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