

Predictive Measures Guide

Integrated Program Management Division

September 16, 2014

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- **Conceived by the NDIA IPMD (formerly PMSC) Program Management Working Group**
 - To assist Program Leadership Team (PLT) in managing the performance of their programs
- **“Guide” Approach**
 - Use of ICPM Predictive Measures (2008) presentation as the basis
 - Use Industry / Government practices
 - Measure is not affiliated with a contributor
 - Make sure the measure is a predictor
 - Not intended as a new set of standards that would be required to assess program performance, but instead provide “menu” of typical measures

Intended Audience

- **Organizations, government and industry, looking for “best practice” approach to effectively manage programs**
- **Each organization should decide which measure is appropriate for their environment and for the life cycle of the program**

***Remember – this is a GUIDE,
not new requirements***

- **Metric Definition – *Not an Exhaustive Description***
- **Calculations**
- **Output / Threshold**
- **Predictive Information – *Most Critical***
- **Possible Questions – *what a PM or LM could ask***
- **Caveats / Things to Watch For / Limitations / Cautions**

- **31 Predictive Measures**
- **20 Contributors**
- **Over 16 Industry / Government Representation**
- **Reviewed by Senior Members Representing Industry & Government**
- **Reviewed by the Board of Directors of NDIA IPMD**
- **Reviewed by NDIA IPMD member companies**

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Acronym

- 1 Introduction

- 2 Schedule Metrics
 - 2.1 Schedule Performance Index (SPI)
 - 2.2 Baseline Execution Index (BEI)
 - 2.3 Critical Path Length Index (CPLI)
 - 2.4 Current Execution Index (CEI)
 - 2.5 Total Float Consumption Index (TFCI)
 - 2.6 Earned Schedule

- 3 Cost Metrics
 - 3.1 Cost Performance Index (CPI)
 - 3.2 CPI vs. TCPI_{leac}
 - 3.3 Range of IEACs (Independent Estimates at Completion)

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 - 5.2 Risk & Opportunity (R/O) \$ vs. Management Reserve (MR) \$**
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 - 5.4 Schedule Margin Burn-Down**

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 - 9.1 Parts Demand Fulfillment**
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10 Rayleigh Estimator

11 Contributors

12 References

**Appendix A: Predictive Measures Commonly Used in the DoD
Acquisition Phases**

Appendix B: Trip Wire Metrics

Contributors

- **Glen Alleman, Niwot Ridge**
- **Bill Altman, Battelle**
- **Blake Crenshaw, Raytheon**
- **Renee R. Frazier, Rockwell Collins**
- **Fran Fulton, Northrop Grumman**
- **Reginald Goodman, Naval Air Systems Command**
- **Louise Joyce, AAI Corporation**
- **Jennifer Lane, Honeywell**
- **Melody McArthur, Harris**
- **Charmaine Narciso-Jiao, SPAWAR**
- **Sam Padgett, NASA JSC**
- **Yancy Qualls, Bell Helicopter**
- **Stuart Retter, Bell Helicopter**
- **Amy Romanelli, Northrop Grumman**
- **Greg Silvernagel, Naval Air Systems Command**
- **Joseph Smith, NASA HQ**
- **Sung Soon Stultz, Rockwell Collins**
- **Stewart Tague, UTC Aerospace Systems**
- **Brad G. Temple, Rockwell Collins**
- **Pete Wynne, Lockheed Martin**

Metrics not associated with contributor

Senior Reviewers

- **Ivan Bembers, NRO**
- **Dave Burgess, NAVAIR**
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- **Gordon Kranz, PARCA**
- **Walter Lipke, AF (retired)**
- **Sandra Smalley, NASA Headquarters**

"Dispositioning" Reviewers

- **Bill Altman, Battelle**
- **Blake Crenshaw, Raytheon**
- **Charmaine Narciso-Jiao, SPAWAR**
- **Yancy Qualls, Bell Helicopter**
- **Sung Soon Stultz, Rockwell Collins**
- **Stewart Tague, UTC Aerospace Systems**

- ✓ **Announce Intent** Feb 2013
- ✓ **Develop Introduction & Outline** Mar 2013
- ✓ **First Draft** Aug 2013
- ✓ **Second Draft** Oct 2013
- ✓ **Senior Review** Nov 2013
- ✓ **NDIA Workshop at IPMC** Nov 2013
- ✓ **Submit to IPMD for comment** Apr 2014
- ✓ **Comments due** May 2014
- **IPMD Approval** Sep 2014

*Comments (55) have been
dispositioned*

Overview of comments

- **Comments (55) provided by Harris (23), Niwot (1), Raytheon (31)**
- **Many of the comments dealt with spelling, figures, additional questions**
- **Comments were either accepted, partially accepted, modified, or rejected**
- **Only 16 comments were rejected**

Summary

- **IPMD Board recommends that Division membership votes to approve Predictive Measures Guide for publishing on website**
- **Guide will be reviewed/updated in 2017**

BACK UP REJECTED COMMENTS

Rejected Comments

Description of Data in the Predictive Measures Guide	Change Request/Wording Clean-Up	Notes
Possible Questions	Unclear description of what an "execution pace" is	"Execution pace" is also similarly used in the PASEG. In addition, the very next sentence goes on to elaborate with the following wording: "measuring how well the program... has actually performed compared with the baseline plan".
Change in plan (OTB/OTS)?	Define acronyms	OTB/OTS is already listed in the Acronyms section. Defining all EV terms is beyond the intent of this document.
Change in plan (OTB/OTS)?	Define acronyms	OTB/OTS is already listed in the Acronyms section. Defining all EV terms is beyond the intent of this document.
Section heading has superscript [14] for source but there is no link	Add bibliography and link to it or external link. Or delete the superscript number	Source 14 is listed on the Bibliography page.
Missing link to SRA (page 71)	Fix link	Link not needed.
Possible Questions	Add a Question: What is the contract ceiling and how close is the Baseline to it?	This section deals with PMB establishment with respect to the Program's scope and requirements. If the customer wants to increase the scope, more budget must come with the scope. This means the Contract Budget Base (CBB) must increase.

Description of Data in the Predictive Measures Guide	Change Request/Wording Clean-Up	Notes
Possible Questions	Add a Question: Does the Customer have the desire to add scope to the baseline to grow capability, meet expanding needs or otherwise change the baseline?	This section deals with PMB establishment with respect to the Program's scope and requirements. If the customer wants to increase the scope, more budget must come with the scope. This means the Contract Budget Base (CBB) must increase.
Possible Questions	Add a Question: What is the contract ceiling and how close is the Baseline to it?	If the customer wants to "grow scope", it must come with a budget increase to the Contract Budget Base. However, this in turn may drive an adjusted ceiling price.
Scheduling Metrics Section chart	BEI is noted as one of the "DCMA 14-Point Assessment Metrics" under Section 2.2 on pg 9. It should also have this notation in Appendix B	Not necessary. This appendix is merely a cross reference
SPI is more sensitive than BEI. BEI places equal weight on all activities, while SPI weights activities by their planned resource loading.	SPI is more sensitive than BEI. BEI places equal weight on all activities, while SPI weights activities by their planned budget values.	Section does not state that schedules are required to be resource loaded.
Count of activities with an Actual Finish date on or before the status date of the IMS	count of activities with a valid actual finish date	Disagree that original wording allows for actual finishes after the status date.

Description of Data in the Predictive Measures Guide	Change Request/Wording Clean-Up	Notes
SPI is more sensitive than BEI. BEI places equal weight on all activities, while SPI weights activities by their planned resource loading.	SPI is more sensitive than BEI. BEI places equal weight on all activities, while SPI weights activities by their planned budget values.	Section does not state that schedules are required to be resource loaded.
If you were behind schedule to meet some friends for dinner, would you call and tell them you were running about \$10 late? Well, that is the way Earned Value Management (EVM) measures schedule performance	Delete	This wording is not in the "Metric Definition" section of any specific metric, but instead is in the introduction to the Earned Schedule concept. Since this concept will be new to a lot of readers, this write-up attempts to describe the difference between EV and ES in simple, relatable terms.
N/A	TSPI's predictive power is reduced very early in the project (PDWR and RD approx equal early on)	Most metrics can be skewed at the beginning of a project. TSPI is likely to be less effected than most with limited data.

Description of Data in the Predictive Measures Guide	Change Request/Wording Clean-Up	Notes
	Add: What is the percent complete of the project?	Need more definition. The question alone is unintuitive. What would a PM do if the PC was high vs if it was low?
Schedule margin is a duration buffer prior to an end-item deliverable or any contract event.	Reorder	Not sure what is wanted here. The wording in 5.3.1 already comes before 5.4. In addition, another suggested comment from this reviewer is to delete section 5.4.