



## Integrating Technical Performance Measurement with Earned Value Management

By Neil F. Albert and Wayne Abba

It is interesting that linking technical performance with earned value management (EVM) is being proposed as if it were a novel concept that has never been accomplished. It is more interesting — and disturbing — that Congress is being urged to determine how performance should be measured on any given program. Earned value practitioners and members of Congress have been inundated with emails, articles, and presentations stating that technical performance measurements are not captured as part of the earned value process because of a perceived shortcoming in the 32 guidelines described in ANSI/EIA standard 748, *Earned Value Management Systems* (EVMS), and that a legislative remedy is needed. At first glance one might agree. That this important area is discussed marginally in the ANSI standard would imply it is not sufficiently addressed. What is missing, however, is appreciation that the standard is not a standalone document. One must understand the intent, implementation, and evaluation of the EVMS process.

First, let's define technical performance measurement. As defined by the DoD, technical performance measurement is

*“the continuing prediction and demonstration of the degree of anticipated or actual achievement of selected technical objectives. It includes analysis of any differences among the ‘achievement to date’, ‘current estimate’, and the specification requirement. ‘Achievement to date’ is the value of a technical parameter estimated or measured in a particular test and/or analysis. ‘Current Estimate’ is the value of a technical parameter predicted to be achieved at the end of the contract within existing resources.”*

The ANSI standard is supplemented by three key guidance documents that were developed by the National Defense Industrial Association (NDIA) Program Management Systems Committee (PMSC): the Earned Value Management Systems Intent Guide, the Integrated Baseline Review Guide, and the Surveillance Guide.

### EVM Systems Intent Guide

The Intent Guide is the primary supplement to implement EVMS as envisioned by the ANSI standard. Technical performance is referenced as a critical measurement to success throughout this document, including direct and indirect references to the ANSI guidelines.

First and foremost, a properly developed work breakdown structure (WBS) is derived directly from the technical requirements of the program. It determines and defines the work scope of the program and therefore is the framework for measuring integrated technical, schedule, and cost performance. Second, the organizational breakdown structure (OBS) identifies the responsible organization and the technical resources necessary to accomplish the work. Integrating the WBS with the OBS permits critical scheduling and resource requirements to be identified. The result is the development of the performance measurement baseline (PMB).

A key guideline in the ANSI standard specifically requires that users “Identify physical products, milestones, technical performance goals, or other indicators that will be used to measure progress.” The Intent Guide expands on the guideline by discussing its management value:

*“Objective indicators enable measurement of work accomplished, thereby allowing its accurate comparison to planned work. Meaningful performance metrics enable better management insight and decision making, ensuring that maximum time is allowed for management action to keep the project on plan.”*

Another ANSI standard guideline requires that users “Schedule the authorized work in a manner which describes the sequence of work and identifies significant task interdependencies required to meet the requirements of the program.” Thus, the schedule aids in assuring schedule and cost integration with the technical performance expectations. The Intent

Guide elaborates on the scheduling guideline by stating:

*“The integration of the technical, schedule and cost aspects of the project results in the*

- *Expected sequence of work*
- *Establishment of significant interdependencies between work packages and planning packages (or lower-level tasks/activities) that determine total work time and critical path through the project*
- *Time-phasing of authorized discrete work for use as a performance measurement baseline”*

## IBR Guide

The IBR Guide provides an integrated risk assessment process. The intent of the IBR is to provide the customer and supplier project managers with a mutual understanding of the project PMB and to attain agreement on a plan of action to handle the identified risks. Risk is not confined to schedule or cost; it is largely technical in nature. The ability of the project’s PMB to achieve the scope of work and key performance parameters is tied to the technical characteristics of the program. As a result, technical risk includes the effects of available technology, software development capability, design maturity, etc. Therefore, management needs to understand these risks and address them in their management processes. However, the dynamics of a program are not stable. Change is inevitable and technical issues cause more change than any other problem. Being able to assess the technical issues, address them appropriately, and ensure that technical performance measures are met is critical to managing the PMB.

## Surveillance Guide

The Surveillance Guide focuses on the effective use of EVMS over time to effectively manage integrated technical, schedule, and cost performance. The goal of EVMS surveillance is to ensure that company processes and procedures are being followed appropriately and continue to satisfy the ANSI guidelines. Key to this surveillance process is ensuring that the appropriate elements are being evaluated. The main

concern is risk, with inadequate technical performance a principal cause of unfavorable variances.

Hence, based on the WBS, the PMB is created to track progress using physical products, milestones and technical performance goals of the program. Since the schedule is the basis for time-phasing the PMB, it is integrated with objective measures of progress to substantiate technical achievement against the schedule plan. This supports the definition of technical performance measurement. The single most important review of the PMB is the IBR, which evaluates the PMB’s risk in achieving the performance objectives of the program.

The foregoing discussion demonstrates that, contrary to oft-repeated assertions, technical performance is intended to be measured throughout the EVM process and is central to the ANSI standard concept of integrated performance measurement. In simple terms, when we take credit for earned value, we actually are taking credit for achieving technical, schedule and cost performance. If the technical performance goals are not met, then schedule and cost performance are adversely affected.

Nevertheless, the answer to the question “Do we integrate technical performance measurement effectively?” is not always “yes.” The requirement to measure technical performance as intended is not universally understood or followed as well as it should be. When a manager takes credit for earned value whether technical performance has been achieved or not, it makes the project appear to be achieving better performance than it actually is. Better establishment of effective entrance and exit criteria to ensure earned value metrics are objective is an obvious remedy that can be reinforced within the existing NDIA guidance and by contractors and government oversight agencies.

Do we need Congress to mandate the integration of technical performance measures with EVM? No. The integration is already an expected part of EVMS, and the documentation clearly addresses technical performance measurement. In reality, the NDIA PMSC Intent Guide, the IBR Guide, and Surveillance Guide are already part of policy. Specifically identified in OMB Circular A-11 Part 7, these documents must be used on all major capital invest-

ment programs because OMB Circulars are mandatory government requirements.

To those who state we need documents to link technical performance with EVM — we already have them. To those who want Congress to dictate how we perform EVM — thanks but no thanks. We can handle EVM without enabling legislation. We have the direction, we have the documentation. We may agree that we need more discipline in any given organization, but we don't need an Act of Congress to achieve it.

## About the Authors



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