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The Honorable Carl Levin, Chairman
United States Senate Armed Services Committee
Room SR-228, Russell Senate Office Building
Washington, DC 20510-6050
Attn: Peter Levine

Subject: Section 302 of the Weapon System Acquisition Reform Act

Dear Chairman Levin:

I applaud your committee for including Section 887 in the FY 2009 National Defense Authorization Act as amended by Section 302 of the Weapon System Acquisition Reform Act of 2009. Section 887 required DoD to submit a report to Congress on implementation of Earned Value Management (EVM). That report, *DoD Earned Value Management: Performance, Oversight, and Governance* (Report), was submitted to your Committee and the corresponding House committee.

Unfortunately, the Report contains incorrect and insufficient information. I am providing additional information and recommendations for your Committee to consider. I will also send this letter to the House Armed Services Committee, OMB, and GAO.

Background

EVM is a program management tool that is supposed to integrate the technical, cost, and schedule parameters of a contract. Office of Management and Budget (OMB) Circular A-11, *Preparation, Submission, and Execution of the Budget*, requires executive agencies undertaking major acquisitions to use an EVM system. Contractors are responsible for complying with the guidelines in ANSI/EIA-748, the Earned Value Management System (EVMS) Standard.

There has been poor implementation of EVM by both the government agencies and the contractors with the result that neither the DoD nor the Congressional oversight committees have reliable contract performance information for decision-making. Per the Report, "In the end, it is DoD and the taxpayer that bear the consequences of unreliable contract performance information."

I reviewed both the Report and Industry's preceding input to DoD for that report. I believe that both documents contain information that is incorrect and conclusions that are not justified based on the facts. I am writing this letter so that your Committee can have additional facts and information for improved understanding and oversight. Most importantly, I hope that the Committee will take actions that will result in needed acquisition reforms.

Industry Input to DoD

DOD had requested Industry views from the Council of Defense and Space Industry Associations (CODSIA). CODSIA responded to Mr. Shay Assad, DoD Director, Defense Procurement & Acquisition Policy.

In my opinion, the CODSIA response does not sufficiently address the deficiencies in the quality of EVM reporting and identify all the correct root causes. I sent two letters to Mr. Assad that that cite the weaknesses in Industry's position and provide specific recommendations to improve the accuracy and integrity of EVM reporting.

The CODSIA letter and my letters to Mr. Assad are available at website, www.pb-ev.com . They are within the *DoD EVM implementation* tab.

DoD Report to the Senate and House Armed Services Committees

The Report includes many valid recommendations for actions to mature the Department's EVM capabilities and to further leverage the benefits of EVM. However, in my opinion, the Report contains an erroneous conclusion with regard to the measurement of technical performance. It also concludes that current acquisition regulations need not be revised. My assessment and recommendations for corrective action follow.

Erroneous Conclusion: Quality of work completed

The Report erroneously concludes that there is an "incorrect perception" or "misperception" regarding the EVMS Standard. It states that there is a misperception that "EVM has no provision to measure the quality of work completed, so it is impossible for EVM to indicate when work is under budget or ahead of schedule and when the scope of work is fully executed."

In fact, there is *no* misperception. There is a serious deficiency in the EVMS Standard. The deficiency enables a contractor to be compliant with the guidelines of the Standard yet fail to report valid performance towards meeting a program's cost, schedule, and technical objectives. The Standard does not provide sufficient guidance to link reported earned value with progress towards meeting quality or technical performance requirements of the customer (**Quality Gap**). Instead, it waives a requirement to link EV to technical performance.

Per OMB Circular No. A-11, a program must be able to measure progress towards milestones for:

- Cost
- Timeliness
- *Capability to meet specified requirements*
- *Quality*

However, compliance with the EVMS Standard does not ensure that a contractor is measuring progress towards milestones for meeting the specified requirements and Quality.

The following slides, which were presented at the recent Integrated Program Management Conference, the National Defense Industrial Association (NDIA) Systems Engineering Conference, and the DCMA EVM Center Conference, discuss the directive in the Weapons Systems Acquisition Reform Act, OMB policy, the Quality Gap and the waivers (EVMS, Section 3.8 and Guideline 2.2b).



Weapons System Acquisition Reform Act of 2009

Directs DOD to provide recommendations to improve EVM and its implementation:

- *Discuss merits of possible alternatives*
- *Submit plan for possible improvements*

Sen. Collins, conference report:

- GAO observed that contractor EVM reporting
 - Lacks consistency
 - Leads to inaccurate data and faulty application of the EVM metric.
- “In other words, *garbage in, garbage out.*”
- “With improved EVM data quality,
 - Both the government and the contractor will be able to improve program oversight,
 - leading to better acquisition outcomes.”



Office of Management and Budget

- Circular No. A-11, Section 300
Planning, Budgeting, Acquisition and Management of Capital Assets
- Section 300-5
 - **Performance-based** acquisition management
 - Based on EVMS standard
 - Measure progress towards milestones
 - Cost
 - **Capability to meet specified requirements**
 - Timeliness
 - **Quality**

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6



EVMS Standard Quality Gap

But **EVMS Standard** and Defense Federal Acquisition Regulation Supplement (DFARS) are deficient:

No guidance or requirement to **link**

- Reported EV with
- Progress toward meeting **Quality/technical performance requirements**



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15



EVMS Quality Gap

EVMS Standard shortfall (3.8):

- “EV is..measurement of **quantity** of work”
- “**Quality** and **technical** content of work performed are **controlled by other means**” !?

Quality Gap



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16



EVMS Quality Gap

EVMS Standard shortfall (Guideline 2.2b):

Identify (ID)

- physical products
- milestones
- **technical performance goals** 

“or” 

- other indicators that will be used to measure progress.

Quality Gap



“or” not “and”

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17

First, Section 3.8 of the Standard, specifically states that EVM measures the “*quantity of work accomplished, not quality and technical content.*” This section provides additional information relative to the EVMS guidelines as an aid in understanding and applying EVM methods.

Second, Guideline 2.2b implies that technical performance goals are optional, not mandatory, as measures of progress because the word “*or*” is used instead of “*and.*”

These clauses enable a contractor to report earned value that is not linked to technical performance yet still be found compliant with the EVMS Standard during DCMA or other EVMS compliance reviews. In the Report’s words, a contractor may “circumvent proper EVM practices to keep EVM metrics favorable and problems hidden.” As a result, “...even if the data provided to leaders are timely, consistent, and complete, they are still of little use if they do not accurately portray the true status of the project. DoD has some processes in place to address the reliability of data that is received from contractors, but it is still a concern.” This condition is an issue that “hinder(s) the government’s ability to meet program objectives by delaying or masking insight into developing problems.”

The Report correctly states that the EVM process is reliable and accurate only if measures of technical performance (engineering-designated technical performance measures (TPM) are identified and associated with completion of appropriate work packages, enabling progress to be objectively assessed. However, neither the Federal Acquisition Regulation (FAR), the Defense FAR Supplement (DFARS) nor the EVMS Standard requires that EV be based on technical performance.

A contractor must report performance against the plan and an Estimate at Completion (EAC) in a monthly Contract Performance Report (CPR). Because of the Quality Gap, a contractor may base its reported progress, EV, on the quantity of engineering drawings or software components completed even though the engineering design is behind schedule to meet its quality/technical requirements or the software cannot perform its required functionality. When EV is based only on the quantity of work completed and ignores a behind schedule condition with regard to the quality of the work products being developed, the CPR overstates progress, understates the true cost overrun and schedule variance, and understates the EAC.

The Committee is aware of many programs that had been consistently reporting satisfactory cost and schedule performance. Then an independent assessment by the GAO or the inevitable disclosure by the Government Program Office revealed that the program was really in trouble with a need for additional funds and schedule. In many of these cases, additional rework was necessary to bring the system to its required technical maturity.

Often, Management Reserve (MR) was raided to provide additional budget to cover rework during early phases of system development. Until the revelation, the contractor was able to defer reporting of the true cost overrun and behind schedule conditions. After revelation, there was insufficient MR remaining to cover mitigation of risks during the later systems testing phase.

A summary of reported, pervasive weaknesses in the implementation of EVM and a comparison between the misuse of EVM and a Ponzi scheme are at the *EV = Ponzi Scheme?* tab at www.pb-ev.com . Effective EVM implementation does not ensure program success. However, if EV were based on technical performance, EVM would be a more effective early warning system.

The Committee can corroborate these assertions by requesting GAO support. The GAO can investigate the reliability and accuracy of CPRs for a sample of programs that are now experiencing significant cost overruns and behind schedule conditions. Did their CPRs provide an early warning of performance issues shortly before major technical reviews such as the Preliminary Design Review or Critical Design Review? Did they report insignificant variances shortly before those events or even immediately after those events? Was there significant use of MR to provide additional budget for rework of the design shortly before or soon after those events?

The Report includes many, excellent recommendations for improving the implementation of EVM and concludes that “none of the recommendations requires congressional action.” However, I believe that its recommendations are insufficient. Although the Report states that there is a DoD concern with the reliability of contractor data, it does not provide a remedy. Consequently, the door is left open for continuing inaccurate reporting of the true technical, schedule, and cost performance of programs. Legislative action is needed to close the Quality Gap.

Legislative Action

I recommend that the Committee and DoD consider possible revisions to the FAR and the DFARS to require that EV be linked to quality/technical performance. The objective of the revisions is to overcome the deficiency or loophole in the EVMS Standard. An alternative remedy would be for Industry to take prompt action to fix the Standard. However, the process of revising and approving a change to an ANSI standard is likely too slow and uncertain to satisfy congressional oversight needs.

Additional guidance on this subject is available at www.pb-ev.com . I recommend the article, “*Integrating Systems Engineering with EVM*,” at the *Advanced EV:PBEV* tab.

My Credentials and Credo

I retired from Northrop Grumman Corp. in 2008 after 32 years, most of them working in EVM on major programs such as the B-2, Global Hawk, and F-35 Joint Strike Fighter programs. I was on the team that wrote the EVMS Standard and received the DoD David Packard Award for Excellence in Acquisition Management for that effort. I was a Finance Officer in the Army during the Vietnam War and am a certified Project Management Professional (PMP). I am also co-author of the book, *Performance-Based Earned Value*, published in 2007 by the IEEE Computer Society/Wiley Books. I taught EVM in India and Korea where companies use EVM effectively on Information Technology contracts and waste no effort to mislead their customers with incorrect status reports and EAC. I hold BA and MBA degrees from Dartmouth College.

I believe there should be acquisition reform for the benefit of the taxpayer and warfighter.

Please contact me if I can provide further assistance.

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