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The Honorable William LaPlante USD(A&S)
1010 Defense Pentagon
Washington, DC 20301-1010

Subj: F-35 Block 4 Subprogram Should Put Its Metrics Where Its Mouth Is

Dear USD LaPlante:

The recommendation below augments the letter, Subj: Outcome-based Metrics that Work to Build a Product that Works; F-35 Block 4, dated Jan. 29. Previously, I requested that you refine the scope of the Technical Baseline Review (TBR) to include an assessment of the use, sufficiency, and effectiveness of outcome-based metrics. Now, please augment the TBR to determine if the Block 4 subprogram uses outcome-based metrics that are based on digital engineering (DE) artifacts as Authoritative Sources of Truth (ASOT).

At a HASC TAL subcommittee hearing on May 29, 2023, Lt. Gen Schmidt proclaimed that “we have continued to make progress building an improved F-35 development environment to reduce the cost of Block 4 and future capability development. Under our Systems Engineering Transformation (SET) initiative, we are digitizing our engineering process to include Model Based Systems Engineering (MBSE), improving our Modeling and Simulation capabilities, and continuing to refine our agile DevSecOps approach to software development.

In the Booz-Allen case study,



Booz-Allen asserts that the F-35 program is embracing...DE across the entire enterprise. This transformation enables the institution to seize advantage of key...DE benefits such as:

- Real-time access to DE artifacts in the systems model
- Formalized rigorous means of involving the entire JPO enterprise in development through models representing a single SOT
- The ability to get to key development milestones faster with a higher quality product through increased efficiency in engineering and acquisition.

Today, GAO reported new delays (GAO-24-106909 F-35 Joint Strike Fighter). Was the latest delay a surprise or did the JPO have and share early warning from its use of outcome-based metrics?

My white paper, “Integrating the Embedded Software Path, MBSE, MOSA, and DE with Program Management,” April 11, 2024, addresses a program manager’s (PM) information needs for authoritative DE metrics of schedule, progress, quality, technical debt, and technical performance. The metrics are needed to inform the PM:

1. If the definitions of the technical baselines (functional, allocated, product), and if

applicable Minimum Viable Products (MVP), and Minimum Viable Capability Releases (MVCR), will be completed on schedule.

2. If the needed capabilities, features, and functions will be delivered on schedule.
3. If the software engineering processes mitigate cost and schedule risks by identifying and removing software-related technical debt early in development (SE Guidebook).
4. If technical performance is being assessed at all levels: component, subsystem, integrated product, and external interfaces.
5. If the intermediate goals for tracking technical performance measures (TPM) are achieved on schedule.
6. If Modular Open Systems Approach (MOSA), defined interfaces between modules that are defined by widely supported standards are achieved on schedule.

I referenced that white paper in a letter to Lt. Gen Schmidt, Subj: Block 4 Issues, Outcome-Based Metrics, and SET, dated August 14, 2023. Please determine if the SET initiative has implemented the use of outcome-based metrics that are DE ASOTs. At a subcommittee meeting hearing on Dec. 12, 2023, Lt. Gen Schmidt stated that:

The Block 4 contract establishes Capability Decision Points (CDP) for an integrated, comprehensive review of the readiness of Block 4 hardware and software to be introduced into specific aircraft production lots. CDDs enable greater oversight and drive higher confidence in development schedules.

The TBR should determine if outcome-based metrics based on DE artifacts are used to measure progress towards achieving MVPs and CDPs.

The F-35 program has been touting its use of Agile methods and the benefits of its SET for several years. Has the Block 4 subprogram put its metrics where its mouth is? The TBR and/or the GAO should determine that.



The bottom line, ***“Use Outcome-based Metrics that Work to Build a Product that Works”*** (not a SOW).

A handwritten signature in blue ink that reads "Paul J. Solomon". The signature is written in a cursive style.

Paul J. Solomon

CC:

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Robert Wittman, HASC
Hon. William LaPlante USD(A&S)
Hon. Nickolas Guertin (ASN RD&A)
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