Paul Solomon
3307 Meadow Oak Drive
Westlake Village, CA 91361
Paul.solomon@pb-ev.com

August 10, 2021

SASC Chairman Adam Smith

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

Subject: Refined Amendment to NDAA to Assess Agile Practices on F-35 Block 4 Software Development

Dear Chairman Smith and Undersecretary Kausner:

This letter augments the letter sent to Undersecretary Kausner on August 6, subj: *Recommendations to Amend NDAA and DoD Policy; Agile Methods, Technical Debt, and Award/Incentive Fees*. It provides additional, refined scope to the proposed amendment. The new scope includes SEI's assessment of Agile practices on the F-35 Block 4 software development. The refinements address issues raised by Dr. Raymond O'Toole, Jr., Acting Director, OT&E in his testimony to the HASC Tactical Air and Land Forces Subcommittee (TAL) on July 13, 2021.

Dr. O'Toole addressed Lockheed Martin's failures to meet the objectives of the Agile framework, known as Continuous Capability Development and Delivery (C2D2). The C2D2 process has failed to field a new software increment, known as a "minimum viable product" (MVP), every six months. He concluded that the six-month C2D2 cycle is not sound.

He informed TAL of the program office's decision to move to a 12-month software cycle and stated that he is "cautiously hopeful" that the decision will mitigate some of these issues.

For background, the following table compares the assertions and objectives of Vice Admiral Mathias Winter, PEO, F-35 Program in 2019, with Dr. O'Toole's recent assessment of the program's failures, and with GAO findings.

- Testimony to TAL Vice Admiral Winter, April 4, 2019
- GAO-21-226 *F-35 JSF, DOD Needs to Update, Schedule, and Improve Data on Software Development,* March 2021.

Failures of Agile practices on F-35 Block 4 software development		
Vice Admiral Winter	**Dr. O'Toole**	**GAO-21-226**
Assertions, April 4, 2019	**Assessment, July 13, 2021**	**Findings, March 2021**

Failures of Agile practices on F-35 Block 4 software development		
This agile framework, C2D2, **provides** timely, affordable, incremental warfighting capability improvements to maintain air dominance against evolving threats to the United States and our allies.	C2D2 is **not delivering capability** as scheduled.	
We **rapidly** and **effectively deliver** technically feasible and operationally relevant capability to the warfighter.	The first version of each increment has frequently **been deficient**.	
Capabilities **will be delivered** on a **six-month** cadence.	The Joint Program Office intended for C2D2 to field a new software increment, known as a "minimum viable product" (MVP), every six months. To date, the process has not worked well. DOT&E has concluded that **the six-month C2D2 cycle is not sound.**	
Transition to C2D2 faster, more flexibly, and more affordably by breaking down and delivering in smaller increments, ultimately *reducing our cost* of doing business.	As a result, each increment has *required more extensive developmental flight testing and multiple subsequent iterations* to fix deficiencies.	Costs for ..Block 4, increased. Total Block 4 **development costs grew** from $12.1 billion last year to $14.4 billion this year, in part due to the additional costs for flight test activities and an additional year of development.

Details of the GAO report were provided in my letter to Chairman Smith, Subj: *GAO Report: Continuing Failures of F-35 Block 4 Software Development and Agile Methods*, March 19, 2021. GAO findings were the basis for my recommendation that SEI assess the metrics that are used. The recommendation was:

- Are metrics identified and tracked that are used to impact decision making? Do the metrics allow traceability from the road map through releases and items in the product backlog?

Based on GAO findings, please add the following questions to the scope of SEI's assessment.

- Are all capabilities included in increment 1 of each software drop?

- Does the schedule provide adequate time to complete regression testing to identify and address defects before the final increment of the software is complete?

- Is the final increment a production ready version of the software drop with mature capabilities and without substantial fixes needed before finalizing the software for release to the F-35 fleet?

- Is the remaining schedule achievable and based on assumptions about the amount of work that can be completed that is rooted in reality?

The referenced letters and this letter may be downloaded from www.pb-ev.com at the Acquisition Reform tab.

Paul Solomon
818-212-8462

CC:
Sen. Joni Ernst, SASC
HASC TAL Chairman Donald Norcross
Kathleen Hicks, Dep. Sec. of Defense
Anthony Capaccio, Bloomberg News
Michael LaForgia, NYT