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

Subj: LGM-35A Sentinel Program Fails to Provide Early Warning

Dear USD LaPlante:

On April 3, 2024, I asked you to review Northrop Grumman's (NG) use of outcome-based metrics on the LGM-35A Sentinel program and verify that NG's Earned Value Management (EVM) reports and Integrated Master Schedule provide early "joint situational awareness of program status and assess the cost, schedule, and technical performance for proactive course correction."

That won't be necessary. The House Committee on Defense Appropriations Report expressed the Committee's concern that "the issues driving the critical overruns were ***not identified sooner***."

Over-Hyped Benefits of Digital Engineering (DE), Agile software, and EVM

DoD and Industry are over-hyping the expected benefits of DE and related modernization transformations, such as Agile methods, just as they over-hype EVM. Botched metrics prevail instead of outcome-based metrics.

NG claimed in a press release, Sept. 21, 2022, "Sentinel is leveraging DE, agile software, and open systems architecture to model and authenticate virtual designs, lowering risk and reducing the time it takes to field the system and new technologies."

NG told *Business Insider*, February 10, 2022, "NG is helping to reduce costs, minimize the speed to field, and keep the US firmly ahead by applying the principles of DE to the weapons systems and equipment it builds for the armed services…As the Sentinel program proceeds, the scope has broadened to include ***optimizing scheduling, cost management***, and resource deployment.

Prediction of Sentinel Failure, including Nunn-McCurdy breach, in 2021

In 2021, I predicted today's failures, including the Nunn-McCurdy breach, in a letter to USD Shyu, Subject: Modernize Systems Engineering (SE) Processes to Leverage DE and MBSE; Reduce Risks to GBSD (Sentinel) Program, dated December 16.

Excerpt:

> Additional rationale for my recommendations is provided in my 2004 article in Defense AT&L Magazine, "Integrating SE with EVM." Despite the potential of DE to deliver performance faster using data-driven analysis, programs such as the Sentinel Program may encounter the same fate as programs which use EVM; schedule slips, Over Target Baselines, and Nunn-McCurdy breaches. You can mitigate these risks if the right base measures of technical and schedule performance are employed with proper contractual direction and incentives.

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Outcome-based Metrics for LGM-35A Sentinel

Excerpts from my letter to you, Subj: Outcome-based Metrics for LGM-35A Sentinel; Same Failures and Needs as F-35 TR-3/Block 4, dated April 3, 2024:Excerpts:

- …corrective actions to improve …the defense industrial base (DIB) ecosystem.
- Please ensure that DE, and especially SE, are integrated with program management.

DE Acquisition Policy and Congressional Oversight Issues

Finally, the removal, today, of the Sentinel Systems Director and the Committee report should be sufficient reasons for you to implement the recommendations in my earlier letter to you, Subj: DE Acquisition Policy and Congressional Oversight Issues. The earlier letter concluded:

Whole hog, not half-assed attempts

Please establish policy, guidance, and oversight to "enable successful adoption of DE to feed the right cost, schedule, performance and risk data to our acquisition decision makers." My white papers provide a template.

We need all four DoD DE Capability Elements and outcome-based metrics. DoD policies and contractual requirements should go the whole hog to buy a product that works (not a SOW).

YES	NO	NO

Half-assed efforts, such as omitting DE capability elements and outcome-based metrics, won't result in a DE ecosystem that include the processes, methods, and practices necessary to conduct DE, are the basis for accomplishing engineering activities and generating knowledge through digital threads and in the form of digital artifacts by extracting information from digital models.

Paul Solomon

CC:

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Hon. Donald Norcross, HASC   Hon. Heidi Shyu, (USD(R&E))   Hon. SON Del Toro
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