

Zero-Sustainment Aircraft for the U.S. Air Force

A Workshop Summary

Air Force Studies Board • Division on Engineering & Physical Sciences • February 2013

The Air Force recognizes that sustainment of legacy weapon systems is a strategic issue for the United States. To assist the Air Force in addressing this issue, the Air Force Studies Board (AFSB) of the National Research Council of the National Academies drafted terms of reference to bring together Department of Defense organizations and industry for one 3-day workshop highlighting current sustainment practices that the Air Force might leverage to reduce maintenance and sustainment costs in the near term. An ad hoc committee was formed to plan and convene the workshop, which was held on December 4-6, 2012 in Washington, D.C., to discuss how science and technology can reduce aircraft sustainment costs in the Air Force and to review costs in maintenance, upgrades, and aging aircraft in the Air Force.

Each year, the Air Force faces a growing gap between the sustainment needs of its weapons and its annual sustainment budget. Overall weapon system sustainment (WSS) costs are growing at more than 4 percent per year while budgets have remained essentially flat. The cost growth is due in part to aging of an aircraft fleet (the average age is 23 years) that is suffering from increasing corrosion and fatigue cracking, with the attendant difficulty of finding replacement parts that are no longer in production and software written in languages that are no longer used.

Costs are also rising due to the need to support higher-performance aircraft and new capabilities provided by more complex and sophisticated systems, such as the latest intelligence, surveillance, and reconnaissance (ISR) platforms. Furthermore, the expectation for the foreseeable future is that sustainment budgets are likely to decrease, so that the gap between budgets and sustainment needs will likely continue to grow wider. One workshop presenter suggested that “the cost of ownership may be more threatening to aircraft than the enemy.” Several participants noted that the Air Force will have to adopt new approaches to WSS if it is going to address this problem and remain capable of carrying out its missions.

In this context, the original intent of this 3-day workshop was to focus on ways that science and technology (S&T) could help the Air Force reduce sustainment costs. However, as the workshop evolved, the discussions focused more and more on Air Force leadership, management authority, and culture as the more critical factors that need to change in order to solve sustainment problems. Many participants felt that while S&T investments could certainly help—particularly if applied in the early stages (“to the left”) of the product lifecycle—adopting a transformational management approach that defines the user-driven goals of the enterprise, empowers people to achieve them, and holds them accountable, down to the shop level. Several workshop participants urged Air Force leaders to start the process now, even though it will take years to percolate down through the entire organization.

These sustainment concerns are not new. The issue has been extensively studied, including recent studies by the AFSB and the Air Force Science Advisory Board. There is recognition that part of the answer lies in bringing consideration of a weapon system’s entire lifecycle into the early planning and design phases of the weapon’s acquisition process. Design

choices such as materials and fasteners can have a big impact on maintenance costs, and principles such as modular design and quick disconnects between modules can aid in reducing disassembly and replacement costs. Numerous recommendations have also been made that address the way the Air Force organizes and manages its sustainment efforts, many suggesting that the Air Force should manage sustainment as an integrated enterprise rather than as a series of parallel efforts for the various weapons programs.

The Air Force has begun to take a more integrated view of sustainment through, for example, consolidating sustainment responsibilities within the Air Force Materiel Command (AFMC) and organizing itself around eight core functions, each with an individual designated as a core function lead integrator. It remains to be seen whether these organizational changes will help to break down barriers to a more integrated approach to sustainment, although several workshop participants felt that there were opportunities for positive change.

The following potential actions, which could be implemented within six months, were suggested by various workshop participants to enable the Air Force to begin to address its ever-increasing sustainment costs.

A. Initiate a sustainment pilot project, championed by the Air Force Chief of Staff and led by the AFMC Commander, partnering with another

major command, using the Navy's naval aviation sustainment program as a template to:

1. Manage Air Force WSS as an integrated enterprise that cuts across program boundaries.
 2. Define a user-driven outcome the Air Force intends to achieve for the selected system and describe the high-level supporting metrics that will be used to measure progress toward this outcome.
 3. Decide who is the single responsible individual/office responsible for managing Air Force WSS costs.
 4. Define a simple, standard tool to use for a system's sustainment business case analysis that includes visibility over all actual sustainment costs incurred.
 5. Establish or enhance transparency of total sustainment costs across the system's lifecycle as well as across all Air Force sustainment and operational organizations.
- B. Utilize the CORONA conference mechanism to reach agreement among 4-star process owners as to the outcome metric to be used for the pilot program. CORONA conferences are held three times a year allowing the secretary of the Air Force, the chief of staff, and senior Air Force military leaders to come together for open discussions on issues relevant to the Air Force's future.

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This is a report of work supported by a grant between the U.S. Air Force and the National Academy of Sciences. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the organizations or agencies that provided support for the project, or the National Research Council.

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