

Building a Capable and Reliable Aircraft

*Rear Adm. W. Mark Skinner, USN
Program Executive Officer, Tactical Aircraft Programs, U.S. Navy*

If a Department of Defense aircraft is struck by enemy weapons or needs to perform under extreme circumstances, the craft has but one task: Get its crew back home safely. The Program Executive Office for Tactical Aircraft Programs, Department of the Navy, is working to ensure the Navy's aircraft demonstrate proven capability and reliability in operations as varied and as dangerous as those required by current U.S. military operations. As the program executive officer overseeing PEO(T), Rear Adm. W. Mark Skinner is responsible for ensuring the office fosters innovative, meaningful research and development, and that it maintains a myriad of programs in the face of ever-evolving demands and increasing operations tempos. He recently took time to talk to *Defense AT&L* about his office's current tasks and challenges.

To help programs become successful, we establish a comprehensive technical baseline, a realistic schedule, and an independent cost estimate at the program's inception.

Q:

The Navy has made a commitment to fielding a 313-ship fleet. As the Navy moves forward in building this fleet, compromises have been required on other historic priorities. Because of affordability constraints, this may require tradeoffs between sailor end-strength, readiness, and even procurement of aircraft versus ships. How do you see the recent cost growth in naval shipbuilding programs impacting the PEO for tactical aircraft programs?

A:

The Department of the Navy's budget request for fiscal year 2009 is currently being analyzed and enacted by Congress as part of the president's budget. The 2009 request maintains the commitment for a 313-ship fleet while putting significant investment into enhancing our tactical aviation capabilities in strike warfare; information, surveillance, and reconnaissance; networked operations; and airborne electronic attack systems. The Navy is currently making adjustments to its proposed programs for fiscal years 2010 through 2015, taking into account a wide variety of factors, including any shifts in priorities reflecting our ongoing participation in the war on terrorism and the need to balance current readiness with investment in future capabilities.

Some trade-offs that are considered in each year's plan are optimization

of production rates, sustaining the nation's shipbuilding and aircraft industrial base, and pacing the current and expected threats to achieve the range of capabilities requested by the combatant commanders. There is always cost pressure as the Navy seeks to achieve the proper balance of risks and opportunities within and across warfare areas, while staying within our funding constraints; and the Navy's PEOs provide the acquisition expertise to help the requirements and resources communities examine the cost and executability of a variety of options. Any proposed changes to procurement quantities or profiles that might result from these analyses are still in the decision-making stage, so it would be premature to speculate on any specific issues.

Q:

Environmental concerns play an increasingly important role in program management. In February of this year, the PMA-265 division of PEO(T), which manages the variants and subsystems of the F/A-18 Hornet and Super Hornet and the EA-18G Growler, was awarded its fourth consecutive Chief of Naval Operations Environmental Award for Environmental Excellence. Can you describe this achievement?

A:

It is a testament to the PMA-265's hard work and dedication to have sustained this high level of achievement. PMA-265 is the only team to have four consecutive wins in this category. It's truly an unprecedented accomplishment.

The success can be partially attributed to the program's decision to dedicate a manager to oversee the environment, safety, and occupational health requirements as part of the acquisition process. Having an ESOH process action forum and a solid system safety team has been instrumental. PMA-265 has been focused, empowered, and ready to assist the ESOH manager with implementing initiatives and assessing potential concerns or risks in the areas of environmental compliance, system safety, occupational health, hazardous materials management, and environmental planning analysis (such as the National Environmental Policy Act and Executive Order 12114).

But more important is PMA-265's continued commitment to intelligently executing DoD Instruction 5000.2 requirements while supporting the end user and, in some cases, serving as the naval aviation lead in implementing policy. The program also sponsors research and implementation of processes and technologies that help to minimize ESOH risks and regulatory burdens. Some of these successes are:

- Serving as one of the first ACAT I programs to develop a programmatic ESOH evaluation and strategy and being the first Navy program to comply with the

March 2007 under secretary of defense for acquisition, technology and logistics policy memorandum formally acknowledging an ESOH risk—which, in the case of the memo, was the occupational noise hazards naval jet aircraft imposed to personnel aboard aircraft carriers. PEO(T) and PMA-265 are engaged with various Office of Naval Research and Small Business Innovative Research initiatives and noise reduction technologies, such as fluidic and mechanical chevrons. We recently demonstrated in static engine tests the ability to achieve sound-level reductions over much of the frequency range (approximately 2.5 decibels) with no thrust impact up to a maximum afterburner engine setting at sea-level static conditions. Not losing the high-thrust capability of the aircraft is critical if the user is to accept the viability of these technologies.

- Flying 182,836 hours without incident. PMA-265's success in designing safety into the Super Hornet and maintaining safety readiness has led the program to surpass 100,000 Class A mishap-free flight hours.
- Continuing to sponsor the trapped vortex combustor, which is a promising technology initiative for reducing emission levels associated with high-power engines such as the GE F-4XX series engines used in the Hornet aircraft.
- Promoting the reduction of material usage both within the aircraft itself and at our aircraft and engine supplier's manufacturing facilities. Our system contractors have made great strides in reducing the use of hazardous materials and the amount of hazardous waste generated throughout the acquisition life cycle, both at their facilities and with the aircraft itself. For example, the design of the Super Hornet contains 40 percent fewer parts and 50 percent fewer cadmium-plated fasteners [*cadmium is toxic and can have a negative impact on the environment*]. We have also designed halon out of the engine fire-suppression system.
- Promoting increased recycling and reuse of Hornet parts when the aircraft enters demilitarization and disposal, and going beyond recycling and reuse of parts identified by the Naval Inventory Control Point save list.
- Enhancing our reporting and prioritization processes for hazardous materials management.

PMA-265 remains committed to mission and environmental sustainment. We will continually seek greener solutions in aircraft design, production, and maintenance processes through technologies and alternatives to reduce our program's ESOH footprint.

Q:

The multi-mission EA-18G Growler is an evolutionary upgrade of the F/A-18C/D Hornet currently in service, and it is expected to perform the airborne electronic attack mission currently being flown by the EA-6B Prowlers. Can you describe what this new fighter will offer? How has it been matured?

A:

The EA-18G Growler's team members adopted a low-risk, evolutionary acquisition strategy with proven mature technologies. The Growler combines the airframe and mission systems of Boeing's two-seat, F-model, Block II, next-generation Super Hornet, including the state-of-the-art active electronically scanned array (AESA) radar and the AN/AYK-22 stores management system. In all, the Growler shares more than 90 percent commonality with the Super Hornet. It also has the latest improved capability III system developed for the EA-6B Prowler. The ALQ-227 countermeasures communications jamming suite and the integrated noise cancellation system were developed to give the Growler improved capability.

In the Growler, the 20 mm Vulcan cannon commonly found on the Super Hornet is removed and additional electrical equipment is added, with the remaining capabilities provided using pod attachments like its ALQ-218 wingtip receivers and ALQ-99 systems. External fuel tanks will be commonly used on the jet to improve the EA-18G's range and loiter time.

The Growler's specific features include:

- ALQ-218(V)2 receiver
- ALQ-99 tactical jamming pods
- ALQ-227 communications countermeasures
- Set satellite communications
- AESA radar
- Joint helmet-mounted cueing system
- Anti-radiation missiles/AIM-120C weapons.

Both aircraft and mission system components of the Growler system were mature and proven systems from the start of the program. The program team did an outstanding job of integration, including establishment of an integrated test and evaluation team to evaluate the systems performance and stability. Much of the developmental testing has been completed, and the system will enter into the operational test this fall.

The current and next-generation capabilities that were combined on that AESA-enabled, front-line strike fighter will provide joint and coalition commanders with unparalleled mission capability and flexibility.

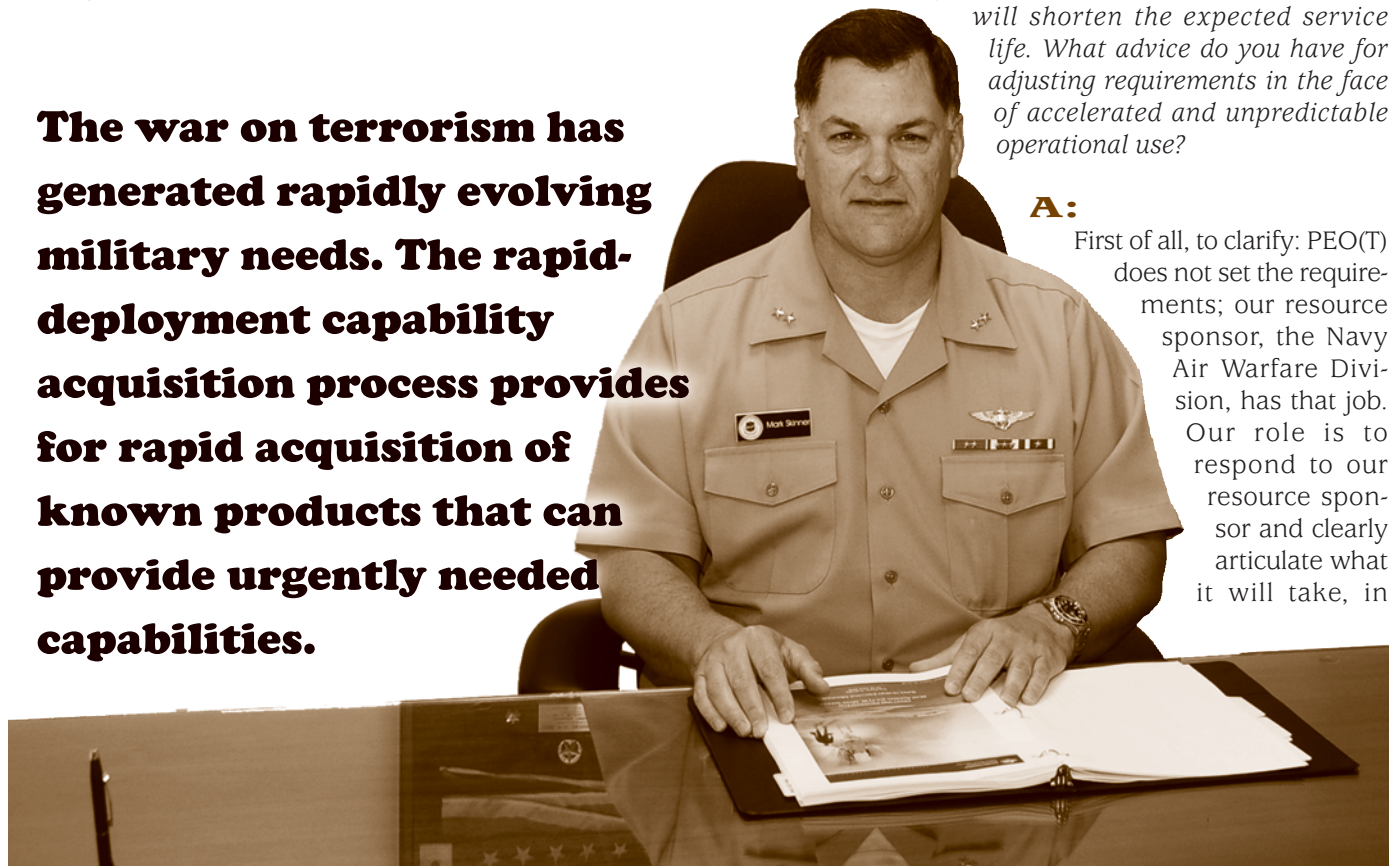
Q:

The F/A-18E/F Super Hornet, currently the Navy's multi-mission strike fighter, is now in its ninth year of full production. While well over half of the total procurement objective has been delivered, additional Super Hornets have been requested to bridge the projected shortfalls resulting from excessive operational use, which will shorten the expected service life. What advice do you have for adjusting requirements in the face of accelerated and unpredictable operational use?

A:

First of all, to clarify: PEO(T) does not set the requirements; our resource sponsor, the Navy Air Warfare Division, has that job. Our role is to respond to our resource sponsor and clearly articulate what it will take, in

The war on terrorism has generated rapidly evolving military needs. The rapid-deployment capability acquisition process provides for rapid acquisition of known products that can provide urgently needed capabilities.



terms of resources and effort, to execute the requirements given to us. To accomplish that, we need to clearly understand the requirement and the current situation, forecast future operational commitments that expend fatigue life of our aircraft, and adjust future procurement and life cycle management plans accordingly.

We are presently doing that with our Hornets by optimizing our current usage on an individual aircraft basis for A-F models and extending the A-D models' service life through inspections and planned modifications. We feed that information back to the Navy Air Warfare Division for use in future decision-making processes.

Q:

Your office also oversees Air Traffic Control and Combat Identification systems as well as tactical aircraft protection systems. Can you share with readers what is new in these systems?

A:

We have many exciting things happening in Air Traffic Control and Combat Identification. Here's a brief synopsis of what is going on with different systems in that organization.

- **The Joint Precision Approach and Landing System** is GPS-based technology that will be the next generation precision landing system and will be compatible for use by all aircraft in DoD and NATO, by civil aircraft, and by the international aviation community. Never before has a single system been developed that is adaptable for multiple operating environments on land and at sea, will eliminate an interoperability gap among the Services, and will replace a multitude of currently fielded precision landing systems. The system will give the joint forces commander the capability to use any aviation asset from any operating environment during any weather conditions.
- **The Mark XIIA Mode 5 Identification Friend or Foe System** provides highly confident, accurate, secure, and continuous friendly identification and positional information of warfighting assets. The MKXIIA Mode 5 IFF System also provides positive, reliable line-of-sight identification of friendly aircraft and ships, and it is fully interoperable with systems used by our NATO allies and with the Mark X/XII Mode 4 systems used by our non-NATO allies. The MKXIIA Mode 5 IFF System will contribute information to the commander's air situation picture, help prevent fratricide during the target engagement process, and enable the safe return of friendly aircraft to their base or air-capable ship.
- **Expeditionary air traffic control systems** have been heavily employed throughout the war on terrorism. These systems are being replaced, upgraded, or over-

hauled to meet the continued operational surge. We are exploring using coordinated or common air traffic control systems with other DoD organizations, and an example is the AN/TPN-31A Air Traffic Navigation Integration Coordination System. Originally an Army-only project, it is now in production for the Marine Corps as well.

- **The Certifiable Man-Portable Tactical Air Navigation System**, which facilitates the safe and expeditious flow of air traffic during joint or combined operations in forward areas, was the subject of an urgent universal needs statement originated by the 1st Marine Expeditionary Force in Al Anbar Province, Iraq. Two available systems were immediately procured and deployed to satisfy the immediate need for the system, and an abbreviated acquisition program was initiated to procure the system in the long term.

- **National Airspace System Modernization** is a major acquisition program being coordinated by the Naval Air Systems Command with the Federal Aviation Administration, the U.S. Air Force, and the Army. The program involves upgrading every federal air traffic control facility in the United States and selected overseas sites with state-of-the-art digital radar, communications, and processor/display systems. It is a key component in enhancing the capacity of the nation's air transportation system to meet the demands of the 21st century.

Q:

How do you actively foster new and innovative technology in your programs?

A:

The team members in my programs identify capabilities needed to support the warfighter through a variety of efforts that involve interaction with fleet users, the test community, the Office of the Chief of Naval Operations resource sponsors, and others. The feedback from the interactions is used to develop roadmaps, or flight plans, that provide the basis for assessing where new technologies are needed.

As part of the larger naval aviation enterprise, PEO(T) provides an overview of the technology it needs to the Naval Aviation Enterprise Chief Technology Office, where coordinated science and technology objectives are published for the use of government labs, industry, and academia.

In simple terms, we pull technology from various sources by assessing what we need in order to provide capabilities to the warfighter. We also participate in events that enable businesses to introduce new technologies applicable to naval aviation programs, allowing us to maintain awareness of their investments in research. We see this type of activity as a technology push from researchers to

Rear Adm. W. Mark Skinner, USN

Program Executive Officer for Tactical Aircraft, U.S. Navy

Rear Adm. W. Mark Skinner graduated from the U.S. Naval Academy in June 1977, and was designated a Naval Aviator in 1979. Initial squadron tours included Patrol Squadron 23 and Patrol Squadron 31, where he served as an FRS instructor pilot.



After graduating from Test Pilot School in 1985, he reported to Force Warfare Aircraft Test Directorate where he was recognized as Directorate Test Pilot of the Year in 1986. He then served as the communications officer for the USS Ranger and as the maintenance officer for Patrol Squadron 6.

In 1992, after serving as the current operations officer for Patrol Wing 2, Skinner attended Naval Postgraduate School. He graduated as a Conrad Scholar and was awarded the Department of the Navy award for excellence in financial management and the Rear Admiral Thomas R. McClellan award for excellence in administrative sciences. He served as executive officer for Patrol Squadron 47 and subsequently took command in 1994. He then reported to Combined Task Force 72/57 as the operations officer, directing forces participating in Operations Vigilant Sentinel/Southern Watch and PRC-Taiwan Contingency Operations.

After completing the Defense Systems Management College Program Manager Course, Skinner joined Naval Force Aircraft Test Squadron as the chief test pilot and assumed command in 1998. Following command, he was selected as the program manager for a chief of naval operations special project. He then served as the acting deputy program executive officer for Air Anti-Submarine Warfare, Assault and Special Mission Programs.

In 2004, Skinner was selected to flag rank and was named commander, Naval Air Warfare Center, Weapons Division and Assistant Commander, Test and Evaluation, Naval Air Systems Command. He assumed his current position as program executive officer for Tactical Aircraft Programs in October 2007.

Skinner's awards include the Legion of Merit, Meritorious Service Medal, Navy Commendation Medal, Navy Achievement Medal, and other unit deployment citations and ribbons.

programs, and it helps us make informed decisions on how best to support the warfighter's needs

Q:

Funding for science and technology is kept relatively constant to enhance capabilities for the naval forces of today, tomorrow, and the future. To maximize return on S&T funding, a naval S&T strategic plan has been developed to focus on areas where the Navy needs to be a world leader and an early adopter of technologies. How is this focus affecting PEO(T)?

A:

By definition, the naval S&T strategic plan outlines how technology will enable future operational concepts for the Navy and the Marine Corps. Implementing S&T effectively will enable the acquisition community to look ahead to how today's requirements meet the emerging requirements of the future. Threats are constantly changing, and the use of S&T coupled with open architecture will allow the Navy to continue to grow and respond to threats in the future.

Not all S&T efforts look out 15 to 20 years. Some efforts also plan for early technology insertions into programs to fulfill current needs or respond to threats. Near-term technology insertions can reduce the cost of acquisition and product support while maintaining and improving system performance. For example, innovative propulsion technologies that have the capability to reduce ambient noise—which can affect the sailor's ability to hear or respond to verbal orders on the flight deck—can be inserted within a current production airframe using rapid technology insertion programs, thus allowing near-term benefits to the warfighter.

Naval S&T focus areas are derived from documents such as Naval Power 21 [*the Navy vision*] and the Navy's strategic plan coupled with warfare capability analysis that focuses on key elements tied to mission needs and security challenges. That is how the needs of the Navy and Marine Corps are defined.

Q:

An effort is under way to better define programs early in the acquisition process, including revising and reinstituting a policy on contractor performance assessment. What are you doing to solidify and improve relationships and communication with industry? How are things improving?

A:

The success of the program execution begins with consistent and phased definition of requirements, and the maturation of technologies that lead to disciplined development and production of systems providing increasing capabilities. I require my program managers to collaborate with the users, testers, and industry. As we work together with

**As we work together
with industry in providing
capabilities, we provide
meaningful feedback through the
use of interim performance
assessment reports and contractor
performance assessment reports.**

industry in providing capabilities, we provide meaningful feedback through the use of interim performance assessment reports and contractor performance assessment reports. Industry takes this feedback very seriously because we use it in our competitive source selections as an evaluation factor for award.

I also encourage my program managers and their teams to meet regularly with their industry counterparts. At my level, we use EXCOMMs, or executive-level meetings, held at a regular drumbeat. The EXCOMM serves as a venue to tee up and understand the issues. More important, it provides a forum so programs can ask for any help they may need. The EXCOMM process works, as evidenced by the successes of EA-18G, E-2D, and ICAP III aircrafts, among others.

Q:

Rapid acquisition continues to be an area of emphasis for DoD. Specific acquisition policies emphasize rapid deployment capability and rapid acquisition processing. In your programs, how are you capturing this need for rapid turnaround and fielding? How does it affect the workload balance?

A:

The war on terrorism has generated rapidly evolving military needs that require responsive materiel solutions. The rapid-deployment capability (RDC) acquisition process provides for rapid acquisition of known products, domestic and foreign, that can provide urgently needed capabilities. In cases in which no known product meets the need, rapid development, integration, and testing of a new prototype solution are often required.

For example, one of our RDC effects is directed at countering man-portable air defense systems, which are surface-to-air missiles that use infrared technology to track

targets and can strike low-flying aircraft. Currently, there are approximately 700,000 man-portable air defense systems deployed worldwide, and there's a threat of terrorists using them against U.S. aircraft. What's more, the sophistication and proliferation of infrared missiles have dramatically increased, allowing for greater infrared targeting capabilities. Without infrared countermeasure capabilities, the tactical survivability of our nation's current generation aircraft is at substantial risk.

In 2005, the Tactical Aircraft Protection Systems of PEO(T) initiated the Navy Directional Infrared Counter Measures



Program (LAIRCM). Rather than starting from scratch, we leveraged the U.S. Air Force's LAIRCM program, which is currently in full-rate production. Using RDC processes, we initiated an initial purchase of hardware to support early operational capability of LAIRCM systems on Marine Corps helicopters. We are now performing a quick-reaction analysis on an infrared-based sensor that will provide even greater operational capability over current ultraviolet systems. Of course, these efforts place demands on an already stressed workforce. Over time, we must examine our staffing distribution and adjust accordingly.

Q:

Top honors were given to the E-2D Advanced Hawkeye program by Aviation Week and Space Technology magazine in March, with the E-2D Advanced Hawkeye team receiving a 2008 Laureate award. Can you talk about what made this program such a notable achievement? Also, what advantages will the E-2D provide to the warfighter?

A:

The E-2 Hawkeye, which is an early warning and command and control aircraft, has seen its mission greatly expanded over the 40-plus years it has existed, and the aircraft's capabilities have been incrementally improved to stay ahead of current threats. In August 2007, the E-2D Advanced Hawkeye performed its first flight—four years earlier than it was expected to reach the skies. Today, there are two E-2Ds in flight test and three on the production line. The E-2D continues the Navy's integrated warfighting legacy by providing broad area coverage resulting in a broader-range capability. With the E-2D's enhanced ability to work in littoral and land-based environments, the platform provides a critical capability to protect our nation's interests.

The E-2D features state-of-the-art radar with a two-generation leap in capability and upgraded aircraft systems that will improve supportability and increase readiness. The new rotodome contains a critically important, continuous, 360-degree scanning capability, while adding an electronically scanned array system. That system allows operators to focus the radar on selected areas of interest. It can detect smaller targets at greater ranges than the E-2C. The new glass cockpit, with 17-inch liquid crystal display panels, provides the co-pilot with the ability to become a fourth tactical operator when not actively engaged in flying the aircraft. This allows the five-person crew more flexibility in fulfilling its diverse missions.

Beyond the battle group, the E-2D's command and control capability makes it a multi-mission platform through its ability to coordinate concurrent missions that may arise during a single flight: airborne strike, land force support, rescue operations, managing a reliable communications network between widely dispersed nodes, and support for drug interdiction operations.

What has impressed me most about the Advanced Hawkeye team is their ability to actively manage their program. Using a unique predictive earned value management model coupled with weekly earned value management status meetings with their prime contractor, the program has lowered its estimate at completion, as verified by the Naval Air Systems Command cost-estimating competency, by close to \$100 million.

Q:

Managing an aircraft program includes remaining vigilant to avoid a Nunn-McCurdy breach—a cost overrun that would trigger a lengthy review and program restructuring. Can you remark on any lessons learned you have about such breaches and how one can avoid problems?

A:

To help programs become successful, we establish a comprehensive technical baseline, a realistic schedule, and an independent cost estimate at the program's inception.

Once a program has begun, we actively manage it by using earned value management tools to monitor program cost and schedule performance. Some lessons learned demonstrate that program breaches often result from a failure to maintain full and stable funding and/or technical configuration control, so we try to learn from past lessons and change the way we do business.

Q:

The Navy enterprise framework is being developed to increase efficiency and maximize the return on naval acquisition investments. Can you comment on how this initiative can improve acquisition processes?

A:

The Navy enterprise framework will enable execution of the Navy's strategy by delivering required readiness and capabilities at best value. The enterprise approach is characterized by collaboration and transparency among key process stakeholders. Outputs are clearly defined and the results are metric-driven.

As the PEO(T), I am ensuring early and aggressive action to improve processes and provide better services to the American taxpayer. To do so, my program managers are focused on cultivating a stable acquisition environment by improving early definition of programs and responsible bidding by contractors through proper incentives. We are reviewing the entire acquisition process from cradle to grave, from statutory governance to cultural change. Everything is on the table, and everything should be considered for improvement.

Q:

Thank you for your time, Rear Adm. Skinner.