



AVIATION WEEK
Executive Intelligence

**Aviation Week Executive Roundtable:
Evaluating DoD Budget Proposal
Impact on Innovation, Execution**

**Washington, DC
March 5, 2014**

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In the wake of the March 4 rollout of the U.S. defense budget, Aviation Week's Executive Roundtable was held to look at the impact on the areas of most concern to industry: innovation and the pace/velocity at which change will be required as programs of record are eliminated and new technologies are required.

The decision path was a difficult one, with military and Office of Secretary of Defense officials facing the daunting task of making choices among things of similarly equal import: procurement or investment, best-in-class versus 80% capabilities, and making trades that will have long-term impact, including replacing the U-2 spy plane with the Northrop Grumman Global Hawk. Some decisions were political, such as the re-insertion of the combat search and rescue helicopter program. And there is no doubt that in the coming months there will be major congressional debate over many of the scenarios outlined in the budget. Supply chains for major programs extend across the nation, leaving a trail of concerns about jobs and facilities.

The one element of the budget proposal that was apparent was the need for the U.S. Defense Department to continue to address potential threats, particularly those evolving in a completely different way than the threats faced over the past decade. Alan Schaffer, acting assistant secretary of defense for research and engineering, outlined the pace of innovation undertaken around the globe, which is reinforced by budget numbers and activities — China and Russia are increasing their military arms budgets, North Korea continues to rattle its missile and nuclear intentions, and countries in the region are increasing their budgets by a record 827% over the coming 10 years to offset the potential threats they face from their much larger, much more militarized neighbors.

Schaffer outlined a core Defense Research and Engineering Strategy:

1. Mitigate: new and emerging threat capabilities: cyber, counter space, electronic warfare, counter-weapons of mass destruction.
2. Affordability: enable new or extended capabilities in existing military systems: systems engineering, prototyping, modeling and simulation, development test and evaluation.
3. Surprise: develop technology surprise through science and engineering: autonomy, human systems, data-to-decisions, basic research.

DoD also is looking at six high priority basic research efforts: metamaterials and plasmonics; quantum information science; cognitive neuroscience; nanoscience and nanoengineering; synthetic biology; and understanding human and social behavior. The headline-grabbing groupings of requirements provided for in the budget include: core technological programs and efforts from unmanned systems to directed energy to next generation engines and missiles. One particular concern that will garner significant attention quickly is assuring access to our space constellation assets while also developing a next generation of capabilities around the area of navigation and communication.

Based on these strategies and efforts, Aviation Week Executive Roundtable participants looked not at the decisions themselves, but rather at what industry needs to be able to do to support military personnel for the near and longer-term.

This response, according to the Executive Roundtable participants, demands speed and agility as the single-most important differentiators in meeting the warfighters' needs, but also in preserving a strong industry. This speed and agility applies to the transition of new developments more quickly, applying rigor and discipline to configuration and requirements definition, and applying agility to maneuver the unknown and unintended consequences that are a natural part

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of business. One contract or set of regulations cannot apply to every instance, and mega efforts outlined by the Defense Department leaders will require a return to early collaboration as part of requirements development.

Under the banner of speed/agility, the participants identified four pressing matters:

- Improved requirements definition, control and discipline;
- Evolution of varied and improved business models and processes to accomplish the mission.
- Performance accountability within every program.
- Preservation of human skills, talents. Talent was the number one issue for this roundtable.

To achieve these top priorities, the Executive Roundtable participants identified gaps that must be addressed – some of which have existed for the past decade but which have become more significant as the complexity of systems has escalated. These include renewed focus on engineering fundamentals, complex system development expertise, particularly in the system validation arena; and continued focus on transitioning knowledge and expertise from generation to generation.

In addition to developing the aforementioned list of needs, the Executive Roundtable also developed a list of recommendations for the participants, but also for industry as a whole:

- Conduct an industry-wide assessment of supply chain risks, beginning at the program level and rolling up, to assess what is at risk in terms of suppliers.
- Use the investment/innovation projects outlined in the budget as a means of communicating the technological challenge/opportunity within the industry for a new generation of talent.
- Work with the Defense Department to renew alpha contracting that allows for collaboration, prototyping and innovation – before locking into a set of highly disciplined requirements for which program teams are held accountable.

In a more detailed effort, one of the Executive Roundtable discussion groups identified core innovation needs for the near-term. In this instance, the roundtable participants identified whether the technology required should be a function of the government or a function of the commercial market.

Technology to Preserve/Develop

G = Government based C = Commercial Market

Access to Denied Areas

- ♦ Stealth G
- ♦ Deny/Deceive/Disrupt G
- ♦ Cyber – offense G
- ♦ Cyber – defense C

Directed Energy G

Precision

- ♦ Navigation G/C
- ♦ Location G/C
- ♦ Attack G
- ♦ Without GPS G

Electronic Warfare G

Big Data Analytics C

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Advanced Engine Technology	
♦ Fuel efficiency	C
♦ Thermal/high temp	C
♦ Environmental	C/G
♦ Tactical specialization	G
Sensor Fusion	G/C
Unmanned Systems	C/G
Space Dominance	G
Robotics	C/G
Multi Intelligence (all sources)	G
Additive Manufacturing	C
Materials Technology	C
Human Dimension	
♦ Man/machine interface	C
♦ Cognitive theory	C/G
Hypersonics	G

In addition, the group looked at the human skills required to meet these challenges:

- Human Skills Preserve/Needed for Future
- Occupational Skills – some exist in government only, e.g. RF design/engineering
- Software Engineering, particularly complex systems validation
- Traditional engineering skills (electrical, aerospace, mechanical, chemical, etc.)
- Bio mechanics/bio metrics
- Communications/bandwidth
- Acquisition agility

Background

Aviation Week’s Executive Roundtable was established in 2004, to bring together executives from across the aerospace and defense (A&D) industry to work cooperatively to improve program performance and execution. Since that first roundtable, the group has addressed a number of issues, from workforce and program management bench strength, to sharing best practices, to addressing the distinct issues surrounding maintenance/repair/overhaul and supply chain integration.

The March 5 Executive Roundtable was based on a two-day review of the proposed U.S. Defense Department budget, including its investments and program plans. Sponsored by Dassault Systèmes, the roundtable was hosted by Joseph C. Anselmo, Aviation Week’s editor-in-chief.

Participants in the roundtable included Ball Aerospace, Boeing Defense Space & Security, Booz & Co., Capital Alpha Partners, Cobham Defense, Corning Specialty Materials, CSSI Inc., Dassault Systèmes, Defense Department, EADS N.A./Airbus Group, Grundman Advisory, AT Kearney, L-3 Communications, Lockheed Martin Information Systems & Global Solutions, Northrop Grumman Aerospace Systems, Pratt & Whitney, Parker Aerospace, Raytheon Integrated Defense Systems, Rolls-Royce, and RTI International Metals.

As is the charter for the roundtables, the discussions followed Chatham House Rules to provide for open, candid discussion concerning issues and actions that, when addressed jointly, will improve overall program performance for the industry. Aviation Week provides only a summary of the discussion, as part of its pledge to the industry in facilitating this discussion.

Detailed findings for the four small discussion groups follow.

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Table 1

Prompt:

Congress and Pentagon leaders are beginning a review of the antiquated defense acquisition policies with the goal of speeding up the acquisition process and thereby achieving specific cost savings. This work also involves industrial input for which many have already been contacted and linked to the process.

- What are the areas of biggest potential – please rank these in order of impact but also in consideration of what is possible near term?
- As attempts are made to simplify the laws, what needs to be preserved?

Response:

The defense industry continues to operate under an antiquated acquisition process. To remedy, the following are needed:

- Disciplined requirements
- Technology readiness levels adhered to
- New programs of record locked down
- Get “teeth” into the performance-based logistics process
- Institute that the configuration manager has the authority to maintain that configuration and fend off “requirements creep”
- Assure that programs/projects have an appropriate succession plan to transition the program from its initial application through its service years and into retirement

Requirements rest on missions – what must be done versus what the program team wants to be done.

Programs should require business case to make requirements change.

Rather than debate 50/50 regulations with regard to sustainment, the defense enterprise (DoD and industry) should look at what the critical services/supplies are and ensure these are preserved for the longer term.

Is there an opportunity for DoD to buy services rather than assets, similar to what is being done in the U.K. – or does government need to own it all?

From an operations stance, we continue to have four air forces; redundancy of mission and asset should be the first to be cut.

Establish realistic readiness requirements so that users are incentivized to use the equipment better; this links directly to who owns the cost – maintainer of the system or the user of the system.

If costs are reduced, some/all of these savings should be allowed to plow back into the program for upgrades or other.

Good leaders must fight bad behavior.

Table 2

Prompt:

While the budget meets the intended purpose of driving out cost, it also creates opportunity in all new areas based on threat assessments for the coming decade.

- Please identify the innovations/technologies that need to be preserved during the coming decade (similar to the U.K. maintaining R&D efforts) to ensure that skills and expertise are retained despite retraction from a war fighting posture.

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- What unique or innovative approaches could be deployed to assure continued research and expertise/dominance in yet-to-be-identified technologies?

Response:

We can talk technologies all you want, but retaining skills/people is the secret to generating and creating those ideas.

Needed:

- Aerospace image/brand attention on what industry is doing vs. what it is cutting
- Revisit incentives to attract talent – is industry behind what others offer?
- Incentivize IR&D and balance long-range vs. immediate or short-range
- Recognize and address pressure to stay ahead in the international market for innovation.

Table 3

Prompt:

We have spoken about agility and speed in terms of defense affectivity. This is also required in terms of business models and execution.

- What business practices also need to adapt to provide speed and agility?
- Please identify best practices in terms of new types of collaboration, contracting, and program management that need to be institutionalized.
- Please identify the gaps – where know-how is missing in terms of institutionalizing business innovation.

Response:

Requirements collaboration and definition are required

- Recognize how complex requirements are; define to appropriate level that enables speed, agility.
- Define what is 80% so we can get there quickly – may get to 90% along the way; should never require 100% because of the time involved.
- Stability of requirements – as requirements change, time/cost increase; need to get back to requirements that say what, not how
- Streamlined acquisition process may provide speed/agility but may not allow for lowest cost or most sustainable options. Example: MRAP was done outside the process, got there quickly but logistics tail still trying to catch up and has added cost.
- Missions based requirements – that define outcome of the mission rather than defining the individual sub-systems that integrate into the larger whole.
- Business systems used /required
- Lead integrator ensures optimization at capability level but this business model really hasn't been integrated into the acquisition process
- A level above a PEO would be needed to make sure a system-of-systems is fully optimized.
- Need to look at open architectures and the impact. Apple's open architecture works because it is regimented and managed well to achieve functionality; however, open without management equals chaos.
- Need to assess our current model of develop/buy/operate vs. a service model – is this a tool that could lead to speed and agility?
- Need to better assess model-based business approaches that commercial technology enterprise uses to build in mission, time, revenue.

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Performance and accountability (*programs – control execute)

- We know decision-making at lowest level is a differentiator in terms of speed and agility.
- Personnel – need a carefully managed balance of rotation, cross-pollination and stability.

Contracting

- Things that need to be achieved collectively are projects that tend to be hard and complex; they require up-front collaboration. DoD did away with alpha contracting that enabled this – was this a good move? Is there a midpoint?
- Lean contracting – include only what is necessary, and delete regulations that do not apply to this specific contract.
- As we go through this period of change to so many programs – what is most important – collaboration up front/alpha contracting.

Table 4

Prompt:

Clearly the threat assessment of the future differs from that which has been faced in recent times. By some estimates, about 15% of the supply chain could be decimated by the budget cuts and shifts in priorities required for the coming decade.

- What percent of your supply base do you believe is in jeopardy?
- How do you know – what data is available that tells you this with an acceptable level of certainty?
- What types of suppliers are needed that today do not have sufficient capacity or do not have a strong presence in the industry to meet the demand?

Response:

- Varies by company and program; most companies are assessing across the enterprise impact supplier by supplier.
- Major concern is that some smaller suppliers who have vast opportunity with the commercial aerospace business will choose not to respond to RFPs because of risk, complexity or just too much adverse business implications – “you want 11 widgets a year for what?”
- There may be some upside as some weaker performers will seek opportunity elsewhere or we will more quickly identify those things we simply need to quit doing (think 16-inch naval guns).
- There are wider implications to society as well as to individuals when we lose a business.
- Secondary effect: primes reacquire to bring some skills/capabilities back in-house.
 - Stress on gaining credit for suppliers will probably increase.
 - As primes focus in on preferred suppliers, the suppliers who remain may have more leverage.
 - If all the primes are using the same preferred suppliers, what is the differentiation for the customer?
- Among the unintended consequences is the impact on our ability to retain experts and attract talent to an industry in this environment.
- Military inherently will become more dependent upon more commercial “stuff”; the systems are not set up to acquire commercial “stuff”.
- We are looking at business risk; must also assess mission risk.

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- As an industry we need to benchmark other industries and assess; is this a role Aviation Week can provide?
- The real differentiator in the future will be supply chain put in place now. Can we benchmark to automotive – get evaluation and provide to industry.
- How do we keep the gate to government interventions narrowly open, while still assuring mission capability? Does the government know what it must retain organically through this change?

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