

Afternoon Keynote Presentations: National Security Space

General James Cartwright, Vice Chairman, Joint Chiefs of Staff

Alden V. Munson, Deputy Director National Intelligence for Future Capabilities

General James Cartwright:

Military space was always planned in the context of a two-war contingency defense policy. There has been too much emphasis placed on a two-front force structure And strategies have always focused on the high end of combat power.

Now we must ask questions like: What is most likely? What are the most dangerous things we will be involved in? Do you shift your weight off the high-end to address the situations in which you are most likely to be involved?

SECDEF Gates has decided on the “situations in which we are most likely to become involved” approach. Based on trends and intelligence these situations could be characterized by persistent multi-year conflicts that will challenge the strategic depth (i.e. conflicts in regions not near a coast) of the country’s resources.

Space should provide the capability to have assured leverage anywhere for globally persistent activities in areas that have infrastructure challenges e.g., sensors, communications, PNT, intelligence, etc. Consider that for the Iraq conflict we had fuel, runways, power, roads, etc while for the Afghanistan mission our troops have none of that preexisting infrastructure. Space is the leveler to handle any areas of the globe with challenging infrastructure.

Consider space situational awareness (SSA): space is crowded from an electromagnetic and physical perspective. The United States is still pretending we are the only ones out there in space, but the reality is much different. Our deterrent needs to shift to acceptance that other states have (or will have) equal SSA capabilities. This mindset will increase the risk of international incidents and conflict if unchanged since the potential for ambiguity in space will increase if denial continues. Space is critical, but we are living in denial about what is out there. People need to be held accountable for their assets in orbit; a common catalog, or a common sensor grid is needed.

The United States must operate in space in a safe and prudent manner. What does sovereignty mean? What does Safe Passage mean?

Remarks on Space Deterrence: What does deterrence mean? We need to think of deterrence as an integrated ability. What are the attributes for space deterrence? The prime attribute should be the ability to affect the calculus of your adversary in space. Exotic solutions may have merit, but if you impose a cost bounding metric on yourself then your policy is flawed. You need to force your adversary to consider the proposition “Maybe we can take out all of their LEOs but even if we do that will not affect the outcome of the conflict.”

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We need to avoid the cost-spiral of we saw in the fighter acquisition program. "Economy, Economy, Economy" more money for diversified portfolio instead of emphasizing exquisite capability. We need to ask ourselves, “What are my space spending priorities?”

The Agility Equation: if we assume 30% of the life of a platform is on the cutting edge the result is your already building an obsolete platform. “The U.S. is in love with platforms, in a world in love with the data coming from the platforms.” We must manage the data, and realize we live in an IT world. I know we can capture data, and put advanced processing against that data and to help solve my problems. However, we can’t build platforms fast enough in an IT world that is changing.

The challenge to change is cultural not technical. This QDR will address that hopefully.

Next generation space radar architecture: conflict today is about the entity level i.e. a vehicle, person, or a plane. In the case of space radar we focused on the ability to track the entity because we had the capability. We should use space radar for broad area coverage and handoff the entity level to a tactical sensor. We cannot afford to chase entity level targets with space assets even if possible.

We have to understand to how to make our platforms agnostic to the type of data to be collected. We need to break down data embargos for space-derived intelligence to our military partners that are participating on the battlefield alongside U.S. troops.

Al Munson:

The perception has been that DoD space acquisition programs have a poor track record. The facts are that in the “good old days” we still had cost overruns. In those days we had forward funding. We also had security to hide behind. The space business was largely driven by national security issues and largely non-partisan. Our requirements far exceeded our capacity. If you had a good idea, you were likely able to get someone to fund new risky systems. The customers were in the beltway and hence we had only a few key decision makers to satisfy.

The paradigm started to change with the first Gulf War; the intelligence community (IC) went from a “mom & pop” enterprise if you will, to an organization acquired by a large corporation. Today, unlike during the Cold War there is no existential threat. Today we confront new asymmetric threats, the veil of security is gone, and Congressional oversight is routine.

Space will always remain expensive. Why is that? The very low production rates, no economies of scale. Almost all the work is done by touch labor and that work force is expensive. These factors were principle to the creation of an acquisition directorate within the DNI and to efforts to make the space IC acquisition practice the “gold standard” once again.

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Past review panels have focused on the “Little A” of acquisition, the usual annual budget cycle of single programs. The “Big A” includes the entire federal budget cycle i.e. Congress and major stakeholders. Our focus must now be on the Big A, not Little A. It’s not the fault of individual program managers although you can find mistakes in any individual program.

The Future Imagery Architecture (FIA) was a product of a “perfect storm”, i.e. no Cold War threat, pressure to build smaller spacecraft due to high launch costs of the Titan IV, etc. FIA awarded at 1/4 of probable cost to a contractor with too little domain experience and as a result the program was un-executable from the beginning.

DoD space can be characterized as having very few programs, with small production runs executed while the nation has a declining aerospace industrial base. Consider space launch rates: in the 60s, about 60/yr, in the 70s, 18/yr, while currently it’s about 12/yr. It has been suggested the DoD space acquisition process should have “fly-offs” similar to the process for the F-22 fighter program; however this process would be time consuming and expensive for space systems.

We will see an increased reliance on commercial imagery. Still, is there a commercial analog for SIGINT? No there is not.

The current DOD contracting environment suffers from an existential challenge for suppliers where if you lose your out. This creates a paradigm where contractors will unrealistically bid to simply stay in business. Fixed Firm Price (FFP) contracts don’t work for research and high technology programs (E.g. lawsuits related to the Navy A-12 program are still ongoing). Cost Plus Contracts provide too little incentive to prevent low balls. This causes an environment where credible cost is not the highest priority for winning government contracts. Finally, bid protests are becoming routine

Suggestions on how to address this state of affairs include allowing for the recovery of discretionary G&A on the base contract but don’t allow recovery of overhead G&A on overruns. This concept may not be practical but it’s worth trying. Don’t start programs you can’t afford. Fully fund programs you are conducting with independent cost analysis. It is not possible to freeze requirements and one can’t proscribe stable funding - but strive for it anyway. Implement disciplined budget and program management, use technology when appropriate, use lower TRL instead of high TRLs (technology readiness levels), and emphasize domain expertise. People with 20 or more years experience in space are hard to find, and we need to return to that. Demand domain competency in our suppliers. That competency is eroding currently.

Regarding current DoD space architectures: our current needs our taking all our money, and we can’t do anything new. We are in the process of re-capitalizing our current portfolio. We acknowledge that if we stick with only our domain-qualified suppliers we will have issues with competition advocates. We kicked off the next generation EO satellite. We will sole source that to the contractor with known domain competency. Schedule is king, if we need to sacrifice performance to keep on schedule

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- we will. We will outsource some EO to commercial providers as insurance in case some government systems capacity fails to realize

Conclusion: high performance space systems will remain expensive. Absent of non-partisan clear-eyed leadership our acquisition programs will have shortfalls.

Q&A

Q: How effective can the EO outsourcing model be?

Cartwright: If you can add diversity, you can add survivability, 90% percent of the requirements can be satisfied by commercial suppliers. We would like to see a constant hot production line, annual delivery of systems, driven by revisit requirements. Any war fighters of any nationality in a shared combat liability situation should have equal access to the space-derived intelligence products. We need the ability to set standards for dissemination of mingling commodity and exquisite data so that the war fighter gets what they want.

There are many ways to achieve the diversity we desire, without spending all the money ourselves. If 80%-90% of requirements are met, we should not pay for the last 10% since that is typically the most expensive. We want the ability to have reserve capacity. We need an industrial base that has resilience.

Munson: Suppose you are considering buying 2 medium resolution imagery spacecraft; it may be better to have service-level agreements for half the capability of 4 satellites instead of buying only 2.

Q: What is the status of Operationally Responsive Space (OSR)?

Cartwright: It's another way to get resilience and survivability. Does that mean you keep a second spacecraft in the barn, or better can you have a standardized bus structure that is just good enough? Is it technologies like 'Plug-n-Play' for agile deployment? OSR is still a work in progress. What are the right mixtures of payloads, what are the right combinations? Is it additional vehicles, is it redundancies in payload? It may take a couple of years before the best practices become apparent.

Q: What role does Information Sharing play in the QDR?

Cartwright: On example: SIGINT common data formats for ground segments, so that it can be delivered to the field commanders. We also are moving to an environment where more work can be done at the front versus at the HQ or mission command center. The current hub-spoke architecture of EO and SIGINT cannot support processing at the “edge”. We are moving to a cloud architecture to support intelligence processing at the edge.

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Munson: The need for information sharing was strongest lesson of 911. ODNI was created in large part to address this issue. Tremendous progress has been made. Not a trivial challenge but lot of energy directed on the problem. An IC Directive was recently published which articulates requirements for information sharing.

Cartwright: Would add that to the extent that DoD space adopts common standards, this will drive the rest of government.

Q: What role would DOD space play in any Climate Treaty Verification scenario?

Munson: Environmental concerns are now an IC priority. Practically, sensors can help in verification by national technical means, but likely DoD will not have responsibility for any treaty verification.

Q: What role will space radar technology have in future DoD space architectures?

Cartwright: Space radar has advantages over EO, so do these attributes have match up to DOD priorities? Yes they do. Space radar is best poised for large area coverage to cue some other sensor. If that is the role, how exquisite does the radar need to be? This is a tradeoff space.

Panel 3: National Security Space Programs

Josh Hartman, Director, Space and Intelligence Capabilities Office, DoD

Bob DeGrasse, House Armed Services Committee

Kevin O’Connell, Innovative Analytics and Training

Maj. Gen. William McCasland, Director, Space Acquisition, Office of the Under Secretary, USAF

Major General William McCasland:

Provided some context regarding the role of the Air Force. Our job is to buy space capabilities for the Joint War Fighter. My command is responsible for the investment account (new things).

Overview of the spacecraft portfolio:

- Global missile warning, SBIRS
- Wideband Global System (WGS)
- AEHF (Protected comms system) versus T-Sat
- GPS
 - Introduced third civil signal (L5)
 - Recognized master control system is the real heart of GPS; decided to compete the MCS separately from the spacecraft acquisition to enhance its utility and sustainment
 - GPS block 3 contract let
- Combined Civil-Defense Weather
 - 3 DMSP SC still on orbit

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- NPOES; weather that matters to NOAA and to DOD is evolving in different directions. The NOAA and DOD relationship is evolving and will perhaps decouple the product lines. Original premise was to combine programs and gain economies and this principle will be adhered to.
- ORS
 - TacSat 3 – with hyperspectral remote sensing capability;
 - First ORS mission to receive IR tasking from Centcom by CY2011. Involves migrating a U2 payload onto a TacSat bus. Believe it’s a credible product but funding still to be identified.
 - Proud of 61 national security related launches in a row, 23/23 for EELV

Conclusion: Areas of Growth (space protection and SSA) include informing the Joint Space Commander of unfolding space events and intelligence for decision support, training of Air Force and other service crews on how to consume SSA products, for the present, on a path to a larger dedicated annual budget for SSA and modernization.

Kevin O’Connell:

Some observers will say the Administration is off to a slow start, but challenges lay ahead. Policy alignment is critical but not enough. Implementation is critical. In the 1970s we met the alignment-implementation standard; can we look back and see what worked?

Alignment has five elements:

1. How will we satisfy the multitude of requirements. Intelligence is organizationally and technically more complex.
2. Civil and Defense firewall - there should be more dialogue. Other countries don’t manage space the way the United States does.
3. Merchants vs. guardians [attrib Pace]- what is the role of commercial firms in space? What is the role of government? Customer, competitor, regulator.
4. International cooperation - we always seem surprised when other states enter the arena. We need objective discussion to assess which topics we wish to collaborate on and those we do not.
5. Alignment in transparent context – Wall Street Journal article on graduate students looking at N. Korea cannot replace real IC activities. We should conduct a tradeoff on closed and open sources.

Bob DeGrasse:

Perspective on SSA: The People’s Republic of China ASAT test stimulated Congressional activity. The administration prepared space protection strategy for both white and black space. Congress welcomes the greater attention by the Administration although the levels of investment required are significant. JSPOC moved from Cheyenne Mountain to Vandenberg, but computing resources are lacking for the JSPOC to do the SSA job needed. Commercial assets deserve SSA services as well as military and human flight.

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Perspective on space systems acquisition: Virtually no space systems are delivered on time or on budget. Project managers need to fully understand the program goals and then stick to the architecture. At present there is no overall coherent plan for DoD space acquisition due to the seam between black and white space worlds.

Josh Hartman:

Governance for space program - do we need a space czar? Although this might be helpful, it's not the root of the problem. Leadership in civil space is the NASA Administrator; no confusion there, leadership in DoD space is fractured; a spectral question that relates across agencies is not collaborated on; who is it? Is it the DNI, is it the NRO, AFSEC, is it CIA or is it AFSPACCOM; the result of this disorganization is a vacuum of leadership within the DoD on space. One possible solution is to require senior level White House attention in an effort to better link requirements and execution.

Budget Priorities: SSA is finally getting the funding needed; but must be spent coherently. EHF and WGS evolution is a more cost-effective approach for communications, while the utility of ORS is still debatable. Emphasis should be placed on core requirements vs. exquisite capabilities, additionally free-flyer options should be examined.

Q&A

Q: Appears the DNI plans to acquire four new EO spacecraft but faces bipartisan opposition? Will the President need to get involved?

A: House/Senate Armed Services and IC committees will be involved. Ranking member of Senate Armed Services is the only vocal critic. Congress may be fatigued by the issue. Expect that Congress just wants a plan and move on.

Q: SSA is inherently a civil function and should not be operated by DoD.

A: no comment

Q: What is the future of the National Applications Office, and their role along with the Law Enforcement community?

O'Connell: Trend of continued use of national imagery by non-DOD consumers should continue

Q: Considering the deficit gaps and national debt, do you see DOD space spending coming under increasing pressure?

Gen. McCasland: Yes, as early as the FY2011 deliberations

DeGrasse: Certain priorities will not suffer weather, missile warning, and communications but the overall DOD budget will undoubtedly be affected.

Panel 4: Governance and Implementation

Cristina Chaplain, Director, Acquisition and Sourcing Management, GAO

Eric Sterner, The Marshall Institute

Patti Grace Smith, former FAA Associate Administrator for Commercial Space Transportation

Paul Carliner, former Senate Appropriations Committee Staff

Pattie Grace Smith:

Ms. Smith’s comments are available for download

Paul Carliner:

We need to achieve a greater level of confidence in NASA cost estimation. NASA has seen a 50% increase in bid protests; for high risk programs this is just an added difficulty in an already difficult program environment. This effect erodes Congressional confidence and may result in changes to post FY2010 budget requests. By 2010 NASA will have been on GAO high-risk list for last 20 years.

Three areas for improvement:

1. Reduce risk
2. Readiness
3. Improved cost estimates

One possible solution is to create a position within NASA HQ at the Deputy Administrator level that would have acquisition oversight above a certain budget level. Create a NASA management program for managers in advanced technology and multiple risk environments. NASA currently publishes a strategic plan every 3 years in hopes of improving alignment between programs, center management, acquisition, workforce and strategic plans.

Cristina Chaplain:

NASA program performance is harder to measure since they don’t have the same cost baselines, over the years as DoD uses. Why is the space acquisition track record so abysmal? Due to lack of government leadership. We start programs before we know what we want. We start programs before we know the technology is ready. Inadequate contracting strategies are utilized, erroneous assumptions are made on use of legacy technologies for new programs. There is a reluctance to cancel programs after the initial start.

NASA has taken a number of initiatives to address GAO concerns. On the Congressional side, the shifting baseline that plagued NASA has been removed, while on the DoD side more competition has been emphasized as well as more independent technology readiness assessments. With these efforts will we see improvement? It’s

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debatable. Will program managers and senior leadership be held accountable? Incentives are still in place for cost underestimation and the Air Force is still paying for mistakes made ten years ago.

What else needs to happen? The United States needs a national security space strategy, we need to establish priorities to eliminate competition within government, and the United States needs to ensure S&T community is providing what is needed for new programs.

Eric Sterner:

Let’s start with the assumption that the space program is not aligned to budget. These failures result from inability to pick the right programs or cancel bad programs. There are four tools for alignment: money, guidance with “shall,” personnel, organization (with an honest broker).

“Go as you pay” made the Vision for Space Exploration dead on arrival. The dichotomy was that this was a significant new initiative resulting from the Columbia Accident Investigation board, but it was not important enough for new funding. This is not the right way to run an RD&T program (i.e. the inverse of the S curve effect in projects) as a result, existing programs were cannibalized. NASA gets lots of guidance but not all of it is useful. In the FY2008 appropriations act alone there are 208 instances where Congress mandates how NASA must run itself most of that guidance has little to do with alignment of budget to policy.

On the NASA organization prior to Mike Griffin’s reorganization, the decision-making process resembled a feudal system. In some cases a center director may have been more powerful than the Administrator. NASA PA&E was created to be an honest broker and helped adhere to Griffin practice of de-linking ownership of function to NASA centers and ownership by the HQ mission directorates.

Today there is still a disconnect between OMB (budget) and OSTP (policy). The White House often assigns personnel based on political considerations, not talent. There are mixed emotions about a national space council; the only forum where OMB and OSTP can come together is in the White House. Yet this is flawed since decisions are then needlessly elevated to presidential level. In theory, the Bush Administration rolled out a multi-year funding plan. However, there is no national decision making mechanism for space.

Q&A

Q: There is active lobbying to the Congress to block a domestic commercial crew capability and support purchase of Russian Soyuz spacecraft for ISS crew support, why is this the case when the country should prefer a domestic capability?

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Carliner: Congress gets to decide one way or another. Lobbying occurs across the spectrum on any number of programs. The policy has already been in place for two Administrations.

Q: What are the things civil servants need to know to be successful in space government space acquisition and management?

Smith: Leadership experience, familiarity with how government operates, government budget experience

Sterner: In government, decisions often lead to more debate unlike the private sector. There are huge numbers of people in government that get to second-guess a government decision. Private sector has no analog.

Symposium closes