



September 27, 2016

National Security Space: 21st Century Challenges, 20th Century Organization

Subcommittee on Strategic Forces, Committee on Armed Services, United States House of Representatives, One Hundred Fourteenth Congress, Second Session

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Statement Before the

House Armed Services Subcommittee on Strategic Forces

***“National Security Space: 21st Century Challenges,
20th Century Organization”***

A Testimony by:

Admiral James O. Ellis, Jr., USN (Ret)

Former Commander, United States Strategic Command

September 27, 2016

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We set sail on this new sea because there is new knowledge to be gained, and new rights to be won, and they must be won and used for the progress of all people. For space science, like nuclear science and all technology, has no conscience of its own. Whether it will become a force for good or ill depends on man, and only if the United States occupies a position of pre-eminence can we help decide whether this new ocean will be a sea of peace or a new terrifying theater of war.

President John F. Kennedy
speech at Rice University
September 12, 1962

Chairman Rogers, Ranking Member Cooper, distinguished members of the Committee, thank you for your invitation to appear today to discuss the challenges confronting National Security Space assets, operations, and organizations. As the Committee is aware, I have been privileged over the past 18 months to co-chair a Congressionally-directed classified study by the National Academy of Science on National Security Space Protection and Defense. Both a classified and unclassified version of that study have been delivered to the Committee. While comprehensively addressing technological, policy, and strategy issues, the study results did not extend to organizational findings and recommendations and I appear at the invitation of the Subcommittee to present my own views on these critical issues, not those of the other study participants or the National Academy of Science.

As this Committee is well aware and as has now been widely acknowledged, the national security of the United States is inextricably linked to space and our unimpeded access to the capabilities resident in or traveling through that domain. Since the dawn of the Space Age, all those who have been a part of what was once a race between two superpowers and is now a \$315 billion global enterprise, have implicitly understood this linkage. Over more than six decades, that reliance on space systems has deepened and broadened. What was once only a realm of exploration and national security has grown to include a commercial element that has become so ubiquitous that it has led us to fundamentally redefine the term national security space. President Kennedy was not the first to draw the analogy between space and the oceans of the world. The literature is sprinkled with references to space "ships," interplanetary "voyages," and star "fleets." Even the term "astronaut" is a combination of two Greek words, for "star" and "sailor." In many ways, the analogy is apt in that space exploration, initially, and exploitation, ultimately, have parallels in mankind's first tentative maritime endeavors. Sea-borne voyages of discovery led to the establishment of trade routes, colonial expansion, and, finally, contests for influence and security in the new domain.

The significant difference, of course, between the creation of global maritime policy and practice and that of the space domain is time. The technologies, customary behaviors, conventions and, eventually, treaties governing military and commercial naval activity evolved over centuries along with the enabling operational concepts, naval strategies, nation-states and attendant diplomacy. The system was thus able to gradually incorporate advances, slowly accommodate stresses, and, to some degree, resolve conflicts in a deliberate manner over time.

A key aspect of the space domain is that the speed of advances in access and space-borne capabilities has significantly outpaced the creation of guiding national -- let alone

international -- strategies and policies. The technological advances in space systems and an increased reliance on them have created a space-enabled "critical infrastructure" that has not been matched by coherent supporting protection and loss-mitigation strategies, clearly articulated and accepted policies, and robust defensive capabilities. These gaps have created newfound concern domestically, confusion on the part of allies, and opportunities for misalignment and misperceptions on the part of potential adversaries. The need to rapidly, precisely, and effectively address all of these factors has created an environment of urgency to find mitigation strategies, fill policy gaps, and fund new capabilities. Done poorly, rapid efforts and expansive rhetoric can exacerbate existing tensions, pursue capabilities that add only marginally to system security, and increase the probability of misunderstanding or miscalculation on the part of potential adversaries. Well-coordinated and properly executed, these efforts can meet real needs, add essential system security, and promote stability. These efforts must succeed. National security and global stability in space and on Earth demand it.

The Subcommittee, in its letter of invitation, asked that the witnesses address several specific issues related to the challenges we face in the national security space domain. Those included the organization, management, leadership structure, acquisition process, operational authorities and other associated elements of the space posture of the Department of Defense (DoD) and the National Reconnaissance Office (NRO). In preparing my response, I drew on my own experience and explored previous studies of the issue, some decades old, as well as a recent summary GAO report to Congress on the subject.

Before I continue, with your indulgence, I would make two points. First, my remarks in no way impugn the efforts of most of those who labor every day in support of our nation's national security space capabilities. Whether in or out of uniform, in government or the private sector, from the halls of the Pentagon and the tactical command centers to the industry factory floors and the launch complexes, they are among the most dedicated and skilled who serve our nation and have created a national security space capability that is the envy of the world. In many ways, they are as frustrated as we are and want the tools to be able to do even better. They know better than anyone that, in national security space, despite their efforts, we are not yet where we need to be. When we speak to them of change, rather than shy away from it, they ask the not-so-rhetorical question: "What are we waiting for?"

Second, we must remind ourselves that organizational change alone, in and of itself, though often an important factor, is rarely an effective stand-alone solution to a major problem. The reality is that every organization is sub-optimized for something, reflective of the tensions between speed, quality and cost as well as the difficult-to-discern differences between what you do the most and what is most important. An alternative approach is to simply make someone responsible, at a senior and impactful level, give them all the authority they need, and make them accountable for outcomes, not aspirations. If they successfully drive real change in outcomes, then, if organizational changes are necessary down the road, the form should follow function. If we get the "What, When and Why" right, the "How" will follow. Organizationally, I often note how the sidewalks should be placed on a college campus: where the paths are worn in the grass. That is the clearest indicator of how interaction really works, in practice, not in theory. In my view, we need not and should not try to precisely define a complex new architecture first. There is important work to be done now.

“Any intelligent fool can make things bigger and more complex. It takes a touch of genius – and a lot of courage – to move in the opposite direction” —Albert Einstein

As this committee is aware, in a recent report to Congress, the General Accountability Office interviewed 17 long-serving space experts and surveyed over 20 years of critical assessments of national security space planning, acquisition and management. They distilled that down to four selected proposals for change that cover the full spectrum from, in naval parlance, “steady as she goes” to “hard right rudder.” In the interest of time and to facilitate a consistent discussion, my remaining comments will focus on those choices.

No Further Changes: Allow time for the recent dual-hatting of the Secretary of the Air Force as Principal DoD Space Advisor (PDSA) to work.

While I appreciate the preeminent role of the US Air Force in space acquisition and operations and have great admiration and respect for Secretary James, I do not believe that this option goes far, or high, enough, no pun intended. We are nearly a year into the process so an assessment of progress should be possible. There are a many stakeholders in the DoD space arena, including all of the other services and the NRO, none of which are subordinate to the Air Force and all of which might question the true independence of a “first among equals” structure which gives a single service oversight of a DoD-wide program. Span-of-control is also an issue; I know how hard SECAF works Air Force issues; what is she delegating in order to take on this new and equally challenging responsibility? The “A” in PDSA is also a concern; an advisory role can be useful but the real leadership challenges come when consensus is not achieved and a decision and immediate action is still required. In the national security space environment, the need is urgent and the challenges are real.

Create a Space Acquisition Agency: Combine SMC and NRO.

I believe this solution would be far too narrow, neglect process, structural and cultural realities and risk “homogenizing” two very different organizations and, in so doing decrease the effectiveness of both. It is not clear which or whose procurement rules would apply and, if a new set needed to be established, risks beginning a process of space acquisition regulation creation that would be characterized by “3 L’s”: Loud, Legal and Long. I also value the healthy tension between two independent development and procurement entities. It mirrors, in a sense, the historic rivalry between the nation’s nuclear laboratories where each took different and competitive approaches to solving shared problems. Creativity and innovation were encouraged and national security benefited as a result. Finally, space acquisition is a critical subset of a larger DoD acquisition process. Wholesale procurement reform should be pursued in the Department while making full use in the near-term of appropriate waivers, programmatic exceptions, innovative contract vehicles, delegated authorities, and other tools and demanding, as I noted earlier, full accountability for outcomes, not aspirations.

Create a Space Force: New military department for the space domain.

In my personal view, this is easily at once the most far-reaching and most disruptive of the postulated options. A new department and a new military service would be a decade in the making and drain and concentrate critical space expertise just reaching maturity in the DoD

and, especially, that resident in the other services. It would risk centralizing and isolating space knowledge and skills, reversing two decades' worth of effort to get space understanding and employment down to the warfighter, no matter what service or agency they serve. The bureaucratic effort to create a new entity would be staggering: literally everything would need to be created anew, from policy, roles and missions to budgets, operational and training facilities and personnel support. The debate, distractions and decisions could be drawn-out over two administrations and five Congresses, with the potential for iterative alterations to the path and objectives. In this case, effectively simplifying and reforming the "devil we know" is a far better option.

"Perhaps because Americans as a nation have a gift for organizing, we tend to meet any new situation by reorganization, and a wonderful method it is for creating the illusion of progress at a mere cost of confusion, inefficiency and demoralization."

Charlton Ogburn Jr., The Marauders, Quote p. 60
Harper & Brothers, New York, 1959,

Creation of a Defense Space Agency: Combine military space functions into one agency but leave the NRO unchanged.

In my opinion, this concept addresses the essential requirements for driving real, timely and effective change in the oversight of US national security space. Properly constituted, it will clearly define the responsibilities, authorities and accountability, in other words, leadership, in a single entity for oversight of military space. After full stake-holder consultation, USD (Space) should also have full decision making authority, subject, of course, to Secretary of Defense review. Combining space acquisition functions of all military agencies into one organization, the NRO would remain a separate organization, which, as noted earlier, I fully support. As a DoD entity, however, the NRO would report to USD (Space) to ensure consistency of policy, cohesiveness of strategy and complementarity of capability. The concept, as the GAO noted, will provide a single leadership organization for all military space activities, provide greater unity and integration of military space acquisitions, and bring focused OSD-level oversight of military space policies and execution. Over a decade ago the Allard Commission on the Organization and Management of National Security Space forcefully noted as a central conclusion that "A strong executive is needed to integrate customer capability needs, set resource priorities, evaluate alternatives, develop and advocate investment plans and programs, and formulate and execute budgets for National Security Space. This executive must be responsive to DoD, the Intelligence Community, and other customers for Space capabilities, and must serve as a focal point for coordinating efforts across the federal government." As those space warfighters I referenced earlier asked: "What are we waiting for?"

Final Thoughts

Before concluding, there are several other points I would like to make:

- (1) The technological advances in space systems and the world's increased reliance on them have created a space-enabled "critical infrastructure" that is an integral part of the national and global information infrastructure. This network includes both civilian

resources that are used in support of national security efforts and those that support more broadly economic and societal well-being around the world. National security space has been redefined and, as a result, must be addressed in a global context. An effective US response to growing space threats cannot be implemented solely by the national security space sector but requires a “whole of nation” response to include civil, commercial and international partnerships.

- (2) A key aspect of national security space, as we now define it, is that the speed of advances in access to space and space-borne capabilities have significantly outpaced the creation of guiding national – let alone international – capabilities, strategies and policies. We have consistently underestimated both the rate of increase in our own space-related capabilities, our reliance on them, and the rate at which potential threats have progressed with the ability to counter them.

- (3) When addressing a challenge, there is an understandable tendency to focus on the system details and operating procedures and neglect the essential broader context. I call it “working the technical and the tactical.” We will always need a full and complete understanding of both what we are trying to do and what are the appropriate limits on what we are allowed to do. The truth is that clear and unambiguous civilian and senior military policy and strategy guidance are essential to ensuring we match resources with requirements to achieve unity of purpose and effectiveness of outcome. They are also critical to reassuring our allies and deterring potential adversaries. If we are to ensure space remains accessible and secure, we must continue to lead global efforts and be very clear about what we stand for and what we will not stand for in that domain. We must not confuse effort with outcome or technology with strategy. Tactical energy in a strategic vacuum is a recipe for disaster.

Conclusion

Members of the Subcommittee. Let me conclude by thanking you all for the opportunity to offer a few thoughts as you continue your important deliberations. As we are all aware, and as the GAO has noted, the Department of Defense has made real and significant progress in making national security space a national priority, a critical first step. Some limited progress has been made in four other areas highlighted as important in oversight and assessment reports dating back two decades. Where progress has not been verifiably made is in the last finding common to those reports: the need for unified leadership and authority in national security space. In my opinion, this is the single most important action to be taken. Given the appropriate resources and authorities, the right leader can dramatically improve the national security space environment we have and shape the environment we need.

I congratulate the Subcommittee for its interest in this critically important topic. I thank you for allowing me to contribute in a small way to your deliberations, and look forward to your questions.

“I do not say the we should or will go unprotected against the hostile misuse of space any more than we go unprotected against the hostile use of land or sea, but I do say that space can be explored and mastered without feeding the fires of war, without repeating the mistakes that man has made in extending his writ around this globe of ours”

President John F. Kennedy,
speech at Rice University,
September 12, 1962

**Hearing before the
Subcommittee on Strategic Forces
Committee on Armed Services
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**“NATIONAL SECURITY SPACE: 21ST CENTURY
CHALLENGES, 20TH CENTURY ORGANIZATION”**

**Testimony of
Martin Faga
Former Director of the NRO
Former Assistant Secretary of the Air Force (Space)**

September 27, 2016

Chairman Rogers, Ranking Member Cooper, and members of the Subcommittee, it is a pleasure to appear today to discuss the challenges confronting National Security Space assets, operations, and organizations. I served with ADM Ellis as a co-chair of the National Research Council study on Space Defense and Protection which this Committee chartered, and I will comment from time to time from the study but I come today in my personal capacity. In that regard, I bring a range of experience gained over several decades of involvement in the space field as a government official, company executive and corporate director. This includes service as Director of the NRO during the first Gulf War sometimes called the first space war and certainly the first major conflict in which space assets including NRO systems played an important role at the tactical level.

The Subcommittee itself and my colleagues have developed well the point that space has become so important that our adversaries fully understand the advantage to them to deny those capabilities to us. Several nations routinely demonstrate impressive capabilities clearly intended for us to see. They see the opportunity expressed by Sun Tzu 2500 years ago: *The supreme art of war is to subdue the enemy without fighting.* We can't allow that to happen.

For a view of just how important space it to modern combat capability, I was struck by the statement a few years ago by Army Lieutenant General Richard Formica who said, "every company commander depends on space, and takes it for granted." He was saying that dependence on space begins at the first level of command, the Captain who commands just over 100 soldiers.

Today, our discussion of response to these threats to space systems is termed resilience. That term tends to conjure up thoughts of hardened satellites making quick maneuvers in space to avoid attacking missiles. That is a view that is too narrow. The attack might well be by means of attack by jamming, cyber or laser. We need to think of the problem as one of mission assurance. That is, assuring that the mission currently assigned to a space system, for example communications, is provided in conflict and that may include non-space backup, switch to commercial satellites or other means.

I know that my colleagues will develop the organizational issues that you raised in your invitational letter. While I will comment on those issues, I'd like to do it from the perspective of acquisition which is a key component of the challenges that confront us.

During the conduct of the NRC study, we recognized that operating in an era where our presence in space will be challenged, requires that acquisition to acquire, modify, backup or replace space capability must be more flexible and more rapid than today. In current times, an analysis of alternatives takes two years to complete. At the end of that time, it commonly recommends continuation of the current system with little change. Gen. Hyten has recently complained that sometimes the underlying data presented in the AOA suggest substantial change that would improve resilience but that information is not carried through to the recommendation. When the authors were asked why, they replied that they received no requirements for resilience so they didn't know how to treat it. This is not a desirable answer but an understandable one. The Combatant Commands are only beginning to study and understand their needs for resilience

including backups and they have few tools for simulation and analysis that would help them like the robust tools that exist for analysis of ground, air or naval combat
Once requirements are set and programs underway, we know that they take far longer to accomplish than they should and that we can tolerate in this era of contested space.

Programs are accomplished by Program Managers. They are my favorite and most admired people. When I was Director at NRO, we had about a dozen Program Managers among about 3000 total people, most of whom worked for those PMs. A point I repeatedly made was “Program Managers are the most important people in the organization and the job of all of the rest of us, including me, is to support them in getting their job done”. I hope the Director would say the same thing today.

That is not the life of a Program Manager in DoD today. In its recent report on Defense Space Acquisitions, the GAO noted that for some programs, PMs are reviewed by 56 organizations at 8 levels above the PM. Needless to say these long processes consume months and much of the time and energy of the PM who I would like to see managing his program, interacting with his staff, his contractors, and his ultimate users. Moreover, in a recent conversation with a PM for a mid-sized program, he related that he had been through all of the steps to appear before the Under Secretary for AT&L but the Secretary has a very busy schedule and his appointment is several months away. I asked what he was doing in the interim. He replied, “wait.” I will return to this point later.

PM authorities today are often tempered by “permissions.” If I ask a PM whether he has the authority to do a particular thing, he is likely to reply, “yes, but I don’t have permission.” What he means is that levels above him have required that before he exercise authorities previously granted, that he receive their permission. This effectively removes authority thought to be granted.

When I watch the life of Program Managers today, I am reminded of a statement made by President Theodore Roosevelt in 1908:

"It is not the critic who counts,
not the man who points out how the strong man stumbled,
or where the doer of deeds could have done them better.

The credit belongs to the man who is actually in the arena;
whose face is marred by dust and sweat and blood;
who strives valiantly;
who errs and comes short again and again;
who knows the great enthusiasms, the great devotions,
and spends himself in a worthy cause;

who, at the best, knows in the end the triumph of high achievement;
and who, at the worst, if he fails, at least fails while daring greatly,
so that his place shall never be with those cold and
timid souls who know neither victory or defeat."

Men in the arena have accomplished great things for our country including fleets of space systems that are the envy of the world. That's why people want to have the ability to attack them.

In it's report, the GAO also stated, "By contrast, the NRO's processes appear more streamlined than DOD's." Why is that? There are a number of reasons:

- The NRO has a relatively narrow mission whose high priority is widely acknowledged.

- The NRO is a joint activity of the DNI and the SecDef and the Director reports to them through a very short reporting chain. This joint activity arrangement of the last 50+ years is unusual but not unique. Another example is Naval Reactors which a joint activity of the Navy and the Department of Energy and is also very successful.

- The NRO can engage fully in the budget process of which it is a part. It would be unusual for significant pieces of NRO budget to mysteriously disappear as happens frequently to DoD PMs.

- The NRO is subject to reasonable oversight, although greatly increased in recent years.

- The NRO must and does follow the Federal Acquisition Regulations but not all of the DoD supplements.

- The NRO is an intelligence organization and understands that acquisition of reconnaissance satellites is only a means to an intelligence end. This means that NRO personnel are engaged with the Intelligence Community every day learning of their needs, offering assistance with the application of current systems and developing new concepts in company with their users.

- The NRO has a relatively small and highly capable staff. They're not alone. Naval Research Lab, many elements of NASA, Naval Reactors, the S&T element of CIA among others are examples of organizations that enjoy very strong staff.

- "Decision Rights" are reasonably clear within the NRO. Decision Rights is the concept that each person knows what decisions they can make and are expected to make and knows when to ask upward or delegate downward.

- Work at the NRO is exciting, challenging and rewarding. People are charged up about their work, something I have witnessed there within the last two weeks.

In addition to DoD and NRO space activities, there is a third element that needs to be mentioned. That is commercial space systems with national security application. Today, that is primarily satellite imaging and communications. The DoD buys lots of commercial satcom but often with short term contracts or on the spot market meaning to buy today what you need today but that means if it is available and also usually means at premium price. For years, Satcom operators have pushed the government to engage in longer term arrangements that might involve entire

satellites for their entire lifetime thus spurring investment in capabilities tightly tied to DoD needs.

There is an example of where the government did exactly this and it is in satellite imaging. NGA has a ten year, fixed price contract with DigitalGlobe to deliver imagery as a service. This meant that DigitalGlobe capitalized the satellites, had them built, launched them and operates them. NGA is entitled to a substantial portion of the capacity which, as a very large customer, it gets at a substantial discount from the normal commercial price. The imagery is simply delivered by cable to NGA servers every day. Pretty neat- avoid all of the acquisition complexities and just buy the service. Of course, this approach isn't applicable for systems with unique military needs and roles like Space Based Infrared System and others.

I'll close by offering some thoughts on organization. Ideas have been forth for many years of ways to organize space more effectively, to put one person in charge, to streamline, etc. We need to remember that acquisition of national security space systems is carried out almost entirely by three organizations: Air Force Space and Missile Systems Center, NRO and Navy's Space and Naval Warfare Systems Command. All are relatively small and capable organizations that work effectively with and on behalf of their users. Operations are carried out effectively by Air Force Space Command and smaller Navy and Army commands. The problem is the 56 organizations and 8 levels that the GAO described that sit above all of this. One common prescription is to establish a very senior position charged to pull it together. I worry that instead of solving the problem, we simply increase 56 organizations to 57. Moreover, space is a means to an end-military and intelligence capability. In my experience, the most important thing is to keep the acquisition process tightly tied to the mission, that is, the ultimate users.

One idea is to have an Under Secretary for Space and to have all national security space elements report to it. For the NRO, that means unplugging from the Under Secretary for Intelligence where it now reports and connect to another official at the same level. But, NRO is an intelligence agency and that's where it needs to be focused. I think similar arguments can be made for the military space acquisition elements that are connected to their operational commands.

Big organizational change comes with long term impacts. In 1992, I reorganized the NRO from an organization based on agency-Air Force, CIA and Navy- to one based on Intelligence function-Imagery and Signals Intelligence. I believed then and believe now that it was the right thing to do but it was wrenching change for the NRO for the next 10 years. In our current situation, I would start by asking the Secretary of Defense to review what all of the DoD parties involved with space do, and whether each is adding value. Are all participants really needed and can the DoD guidance, policy, budget and oversight processes be streamlined? The answer for some will be that their role is congressionally mandated so change may well require legislation. I would measure the response by constantly examining what happens to the Program Manager. When the person who is actually getting the job done starts on the journey, what happens along the way? If the Program Manager's life gets better, then we're on the road to success.

Thank you for the opportunity to offer my views today. I look forward to your questions.

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**“NATIONAL SECURITY SPACE: 21ST CENTURY CHALLENGES, 20TH CENTURY
ORGANIZATION”**

**Testimony by
John J. Hamre, Ph.D.
President and CEO
Center for Strategic and International Studies
Washington, D.C.**

September 27, 2016

Chairman Rogers, Ranking Member Cooper, distinguished members of the Subcommittee on Strategic Forces, I am honored to be invited to appear today before the Strategic Forces Subcommittee, and to appear with my esteemed colleagues, Admiral James Ellis, former Commander-in-Chief of the U.S. Strategic Command, and Marty Faga, former head of the National Reconnaissance Office. There have been no finer leaders for American security than Jim Ellis and Marty Faga. It is a privilege to appear again before this Subcommittee. Your work on behalf of the American people is essential, and I commend you for holding this very important hearing today.

You have asked that we focus on “the challenges we face in the national security space domain and how these challenges relate to the organization and management, leadership structure, acquisition process, operational authorities” for the space mission. I will focus more on the challenges we face and offer a set of recommendations.

First, let me say that I am appearing here today as a private citizen. I am not representing the Center for Strategic and International Studies where I am the president and CEO. CSIS does not take positions on policy matters. Our boards and commissions do, but CSIS does not. So I am appearing here today in a private capacity.

I know that our time is brief, so I will focus briefly on 10 propositions. I would be pleased to amplify on any of these propositions during the question and answer period.

First, we once could count on assured use of space-based resources for any operational mission for the Department of Defense and the intelligence community. That is no longer the

case. Adversaries have moved aggressively to create capabilities to challenge our use of space. It is a serious threat, and very real.

Second, we have good broad space policy guidelines. But those space policy guidelines are not accompanied by sufficient operational planning when it comes to continuity of operations. We lack the redundancy and capacity to reconstitute space resources in the event of a dedicated attack. More importantly, there is no operational doctrine concerning defending space or responding to imminent threat against space resources. The scale of vulnerability is great, and the detailed assessment and operational planning required to ameliorate these vulnerabilities is insufficient.

Third, space systems will be attacked (and this includes the elements of the system on the ground). Indeed, the first strike in a conventional war could well be in space. We have not devoted adequate time and focus on what it takes to operate space systems in a contested environment.

Fourth, the passage of time gives us options that we did not have in the last century. The huge expansion of commercial activity in space, and the internationalization of commercial space activity, are opportunities not just threats.

Fifth, perhaps the greatest near term threat we face is the vulnerability of our space systems—satellites yes, but certainly ground-based support systems—to cyber disruption. Cyber-attack is the most powerful step an adversary can take without triggering a redline to war. We have seen public displays of Russia's hacking capabilities. We must assume they are already inside important space IT systems. The Secretary should immediately launch an assurance review of space control systems. The space command and control architecture must be mapped to exquisite detail and a vulnerability assessment must be undertaken.

Sixth, while individual combatant commanders may anticipate some disruption, none of them has fully anticipated the impact on their plans of a robust attack on space systems (here used generically to refer to on-orbit and terrestrial elements). We need to stress-test our war plans. I would give this assignment to the Chairman of the Joint Chiefs of Staff and ask him to report back next year on his findings.

Seventh, every incoming Administration conducts a fundamental review of the policies, budgets and problems that they inherit. This is a time for making fundamental choices for at least the first four years of a presidency. After conducting the stress test, the next Secretary of Defense and the next Director of National Intelligence should establish a joint review committee to establish a vulnerability baseline for all space systems and assess the program-of-record to address these vulnerabilities. This is the time to get a proper balance between plans and resources.

Eight, our global positioning system is subject to jamming and could be attacked. We should plan now to install new chips in receiver units that allow that unit to receive the signals from all global positioning systems. There needs to be some care in implementing this, to be sure, but GPS is too critical for our war-fighting to have it jeopardized by hostile action.

Nine, as I mentioned earlier, the huge expansion of commercial space activity is an opportunity. I believe we should substantially shift our focus in space-based communications to rely on commercial platforms, including foreign satellites. Redundancy is the key and we need many more channels to insure continued communication links.

Ten, I believe we should start now to diversify our remote sensing systems. I use the term remote sensing to encompass all of our reconnaissance platforms. We still need high fidelity systems, to be sure. But we cannot count on their assured continued operation in time of combat. So we need to diversify our capabilities through hosted payloads on other satellite platforms.

Organizing for Space

Now let me come to the point of your hearing, which is the role that leadership and organization plays in our space program. I have spent a good deal of time talking this through with colleagues who are far more knowledgeable than am I about space. Honestly, there is no consensus on the way forward. We are not well organized to deal with the new challenges we face in space. The old structure may have been sufficient when space was an uncontested area of operations. That time has passed.

I have discussed several broad options with my colleagues who do specialize in the space mission. It seems to me we have four alternatives

- Alternative 1: Create a 5th military service, a Space Service
- Alternative 2: Elevate the Space Command to become a Unified command on par with the Strategic Command and other combatant commands
- Alternative 3: Establish the space mission along the lines of the Missile Defense Agency, as a unified agency with a focused mission reporting directly to the Secretary of Defense.
- Alternative 4: Model a new relationship for space analogous to the Department of Navy which has a Navy and a Marine Corps. In this instance, a Space Service would be established within the Department of the Air Force, but with separate budgets, career management, etc.

As I stated earlier, there is no consensus among my space expert friends on which alternative we should pursue. I have spent a lot of time studying the organization of the Department of Defense. Every organizational question comes down to “moats and gates”. Organizations naturally define borders for themselves and build bureaucratic moats to protect those borders. And because of the complex and integrated way we must now fight wars, the Secretary has to find ways to build bridges across the moats.

For various reasons, I would advocate elevating the Space Command to become equal in stature to the Strategic Command, as a joint war-fighting unified command. I think all of the other options make the moat too wide and the gates/bridges too few. We know how to work with unified commands in the joint command system. If you feel we need to beef up the

capabilities of that command, we can always add the exceptional budgeting and acquisition procedures we use currently for the Special Forces Command.

I used to be the Comptroller for the Department of Defense. Honestly, I don't like carving out and giving exceptional budget controls to sub-elements of the Department of Defense. We have too little money in general to operate the Defense Department and the Secretary needs maximum flexibility to allocate resources where he believes they are most needed for the array of missions he faces. Therefore, as a matter of principle, I resist carving out exceptional budgetary authorities. But I also have to admit that the space mission is in danger, and we need exceptional efforts at this critical time.

Conclusion

Chairman Rogers, Ranking Member Cooper, distinguished members of the Subcommittee, I thank you for holding this very important hearing, and for inviting me to be a part of it. There is no single area in the Defense Department that has me more worried than the resiliency of our space assets. I am grateful that you are devoting so much time to this critical question. I would be pleased to answer any questions you might have for me.