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SENATE ARMED SERVICES COMMITTEE  
STRATEGIC FORCES SUBCOMMITTEE

**STATEMENT OF**  
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**BEFORE THE**  
**STRATEGIC FORCES SUBCOMMITTEE**  
**OF THE**  
**SENATE ARMED SERVICES COMMITTEE**  
**MILITARY SPACE PROGRAMS HEARING**

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Mr. Chairman, distinguished members of the Committee, as the Deputy Chief of Naval Operations for Communication Networks, I am honored to appear before you today to address your Navy's space activities. Let me begin by thanking the Congress for its sustained and significant support to the men and women in our Armed Forces. I am the Navy's resource sponsor for space; in that capacity, I am responsible for funding Navy space programs. This sponsorship includes the Mobile User Objective System (or "MUOS"), which is the next generation Ultra High Frequency (UHF) Satellite Communication system. MUOS will provide more capable tactical communications to our joint, mobile warfighter. I am also responsible for developing the Navy Space Strategy, writing the Navy's Space Needs letter, and supporting the Navy Space Cadre.

If I had to summarize my testimony to you today in a one sentence sound bite, it would be that the Navy is **critically dependent** on space to conduct not only our wartime mission, but also our core capabilities of forward presence, deterrence, sea control, power projection, maritime security, humanitarian assistance, and disaster response. A day without space is a long day, indeed. A wide array of National, Joint, and commercial satellites currently provides Navy commanders with essential worldwide communication capabilities; navigation; missile warning; meteorological data; and over-the-horizon

intelligence, surveillance and reconnaissance. Although the Navy is one of the largest 'users' of space in DoD, we rely on the Air Force and the intelligence community to develop and field the majority of our space systems.

### **Navy Space Strategy**

Let me now address the Navy Space Strategy. One of the Navy's primary goals is to shape the outcome of Joint deliberations on future space capabilities to maximize naval combat effectiveness. Within the Navy, space-related functions and responsibilities are distributed among different commands, which together constitute a functional "Navy Space Team" that works collaboratively to advance our many goals in space.

In 2008, the Chief of Naval Operations published the Navy Space Strategy, which provides key elements and guidance to implement the DON Space Policy. The Navy Space Strategy focuses on two broad themes. First, to influence the large DoD and national investments in space systems through direct, active participation in the National Security Space enterprise. Second, to leverage DoD and national space resources through improvement of the integration of space systems capabilities into the Navy's combat systems. Our strategy addresses five key goals: (1) mitigating the impact of the risk that adversaries pose to critical space systems upon which the Navy depends; (2)

identifying, documenting, and advocating Navy's specific requirements for future space systems; (3) posturing the Navy Space Cadre to ensure we place the right person in the right job at the right time; (4) prioritizing and funding essential science, technology, research and development efforts to meet Navy's needs in space; and (5) expanding Navy leadership engagement with senior Department of Defense, Joint, and National Intelligence community space leaders to better advocate for, and positively influence, Navy issues in space.

Your Navy is actively engaged with key national and joint space-related organizations to ensure current and future Navy needs in space are identified. Venues for this engagement include the DoD Space Posture Review, the Quadrennial Defense Review, and National Security Space Program assessments.

A specific example of this is our active participation with other Services and the intelligence community in addressing the current and future electro-optical satellite architecture. Secretary Gates' and Director Blair's recent decision on electro-optical modernization validates the importance these systems play in our national security. Through this modernization we will create an enabling collection of capabilities to support current and future naval operations. In addition, we continue to assess the military utility of commercial sensing capabilities to support our current

operations worldwide. For example, within the Sixth Fleet area of responsibility we are currently looking at the value of commercial sensing to support Theater Security Cooperation and Maritime Domain Awareness.

Navy is also working with the newly established Space Protection Program sponsored by Air Force Space Command and the National Reconnaissance Office.

### **Ultra High Frequency Narrowband Satellite Communications**

The Navy's major space segment responsibility to the joint community is the Ultra High Frequency (UHF) narrowband satellite communications constellation. Today this constellation consists of eight UHF Follow-On satellites, two residual Fleet Satellites (or "FLTSAT"), one Leased Satellite (or "LEASAT 5"), and leased capacity on SKYNET 5C. The Mobile User Objective System (or "MUOS") will begin to replace these systems in 2011.

MUOS, which is designated as a Major Defense Acquisition Program, is the next generation UHF satellite constellation; it will consist of four operational satellites and an on-orbit spare. MUOS will support Unified Commands and Joint Task Force Components, DoD and non-DoD agencies, and allied and coalition users. With both a legacy UHF payload that provides the same capability as the current UHF Follow-On satellite, and a new UHF waveform payload, MUOS will significantly increase the number of

accesses and throughput available to the warfighter by more than an order of magnitude while retaining backward compatibility with legacy UHF terminals. It will provide tactical narrowband netted, point-to-point, and broadcast services of voice and data worldwide in challenging environments including double canopy foliage, urban environments, and high sea states, as well as mitigate threats to deny use of the satellite.

MUOS is critical to satisfying the demand for tactical satellite communications. During OPERATIONS ENDURING FREEDOM and IRAQI FREEDOM, the UHF system (UHF Follow-On, FLTSAT, and LEASAT 5) was only able to support 20% of the narrowband tactical UHF satellite communication capability requested by operators even though 80% of the capacity was devoted to these operations. LEASAT 5 will reach its end of service life in early 2011, and the UHF Follow-On constellation is predicted to reach an unacceptable level of availability in May 2010. The good news is that the FLTSAT and UHF Follow-On satellites are operating well past their design lives -- we are getting every bit of our investment out of them...and then some. In order to minimize the operational impact of any gap in UHF satellite availability, we are executing a mitigation plan, and developing further paths to maximize system capability until MUOS satellites and MUOS-capable terminals come online. We have increased the use of leased commercial bandwidth on LEASAT 5,

and have recently added a lease on Skynet. One of our major mitigation efforts involves the maximization of available satellite communications channels on the newest UHF Follow-On satellite. The program office for UHF Follow-On took advantage of the satellite's digital capability and component redundancy to allow use of 10 additional channels, beginning 5 months ago in December 2008. This was achieved at virtually no cost. Similar gains may be possible on the legacy payload that MUOS satellites will carry, once on orbit. We are now exploring this option as part of our effort to maximize accesses during the transition from legacy to MUOS-capable terminals. The MUOS advanced waveform will deliver capabilities such as increased capacity, higher data rates, and ability to operate with smaller terminals. The fielding of MUOS-capable Joint Tactical Radio System (JTRS) terminals, and/or the upgrade of existing UHF legacy software-programmable terminals, are required for the use of this new MUOS capability.

Today, the UHF Follow-On satellite supports approximately 600 simultaneous accesses worldwide. Based on evolving war fighting concepts in support of the Guidance for Development of Forces, UHF satellite communications requirements are expected to grow, and MUOS, as designed, will be able to support that requirement.

The MUOS program office currently projects a schedule delay to satellite #1's on-orbit capability, from March 2010 to no earlier than February 2011. The prime contractor has experienced challenges with two of the key pieces of technology. Several challenging technical hurdles still remain, including final satellite assembly and certification. The program office has been aggressively addressing and mitigating cost and schedule issues.

The delivery of MUOS is a high priority for Navy. Warfighters need MUOS not only for the advanced capabilities that it will provide, but also for the warfighter-critical legacy payload, which will replenish our rapidly aging UHF Follow-On constellation.

### **Operationally Responsive Space (ORS)**

With regard to Operationally Responsive Space, satellites provide global access and are a key enabler for our Navy's worldwide missions. To maintain our asymmetric expeditionary advantage, we must be able to surge additional space-based capabilities such as intelligence, surveillance, and reconnaissance; position, navigation, timing; and satellite communications, on accelerated timelines. We must be able to add capabilities in any area of focus, as well as rapidly re-constitute lost capability. Operationally Responsive Space

solutions have the potential to fill the gaps for warfighters going in harm's way, and represent a capability which the Navy needs to maintain our operational advantage.

We are excited about the potential of the Operationally Responsive Space concept, as it offers maritime forces the flexibility to meet critical warfighting capabilities and counter increasingly agile adversaries. As part of the joint Tactical Satellite (or "TacSat") and Operationally Responsive Space effort, the Office of Naval Research invests \$15M of science and technology funds each year in moderate-to-high-risk projects that result in significant prototypes through the Space Innovative Naval Prototype program. Investments are focused on naval capability gaps that space-based systems can fill, such as ship tracking, acoustic data exfiltration from sonobuoys, mobile communications, submarine detection, red force cueing, and littoral environment characterization. The Naval Research Laboratory is managing the Operationally Responsive Space Payload Technology initiative for OSD.

TacSat-3, which is scheduled to launch this month, includes a payload sponsored by the Office of Naval Research, which provides an IP-based data exfiltration capability to collect information from a wide variety of underwater, surface, and land-based sensors.

The Office of Naval Research and the Naval Research Laboratory are leading development of TacSat-4 for the Joint community, and funding a UHF Communications payload which will support mobile communications as well as sensor data exfiltration. TacSat-4 uses a prototype spacecraft bus which was designed as part of a government-industry team effort to develop and mature standards for increased modularity. The TacSat-4 spacecraft is scheduled to be launched this September. It will primarily support the U.S. Central Command Area of Responsibility, although other combatant commanders may benefit from its coverage as well.

The TacSat series of experiments reflect the partnerships that must be developed and nurtured between the services, combatant commanders, the Intelligence community, and industry, to produce innovative solutions that leverage the best talent available across the national security space community to solve warfighting challenges.

The Operationally Responsive Space attributes of flexibility and agility not only provide advantages in the current operational environment but also have the potential to positively affect the space industrial base. The shorter project cycles should provide a broader base of rapid response experience for the space industry and space cadre, and will establish a faster acquisition rhythm in the long run.

## **Summary**

In summary, space systems are a critical enabler for maritime operations. Your Navy has a long and proud history in space, having developed a number of technological breakthroughs. The list of Navy 'firsts' in space includes: the first space communications used for operations; the first controllable space launch vehicle; the first satellite tracking system; the first successful electronic intelligence reconnaissance satellite; the first space object tracking system; the first demonstration of on-orbit atomic clocks; the first military broadcast satellite; and the first astronauts to orbit the earth, orbit the moon and crew the Space Shuttle. The Navy looks forward to more innovative space "firsts" to come in the decades ahead.

The Navy's mission of keeping air and sea lanes open and ensuring the security of our citizens at home and abroad requires a global reach and persistent presence. We must be constantly ready, whether it is to deliver on a mission of mercy on one hand, or more lethal measures in combat on the other . . . and everything in between. Our ability to respond, as well as work with our Sister Services and coalition partners, depends on space capabilities with inherent flexibility and speed to support our worldwide responsibilities.

The Navy must leverage DoD's and the intelligence community's space capabilities and must be involved in future space developments to ensure our ability to successfully conduct maritime operations. Future U.S. satellite programs are now being developed that promise additional benefit and capabilities to Navy warfighters. Due to the long lead times involved in complex space programs, it is even more critical that naval requirements and maritime missions continue to be factored into the pre-launch design and planned on-orbit operation of all future satellite systems being considered for acquisition. Without active Navy involvement today in ongoing deliberations over future satellite programs, your Navy risks operating in future scenarios with space systems not optimized for the maritime environment and ill-equipped to contribute to key important issues affecting our national security.

Thank you for the opportunity to share our efforts with you today. So let me end as I began -- the help of the Congress in general, and this subcommittee in particular, is deeply appreciated.