

Statement of  
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Mr. Chairman and Members of the Committee,

I am honored to appear before you today as the Commander in Chief, United States Space Command (USCINCSpace) to **discuss the promise and potential of space. I'd like to share with you the progress we have made to date in military space and our vision for its future.**

First, let me say that USSPACECOM Components are doing a superb job supporting NORAD in the mission of protecting North America, deterring nuclear attack, integrating space into today's operations, and unfolding the promise of space not only for tomorrow's warfighters but also for our Nation at large. I am extremely proud of our people. They come from every branch of the armed forces and our civil service. Their sacrifice, dedication, and enthusiasm are truly our greatest treasure, a treasure that cannot be bought with money, rank, prestige, or any other personal price. In an age when it is all too popular in too many circles to denigrate the virtue of public service, I stand in awe of the commitment to our Nation which is demonstrated every hour of every day by the superb young men and women with whom I am privileged to serve and whom I have been given the great honor to command. If I have only one message for you today, it is that the future of the Republic, at least as I see it in USSPACECOM, rests safely and solidly on a bedrock of dedicated commitment, high competence, and deeply held patriotism that constantly takes my breath away. For our part, all we have to do is to create an environment that will permit these marvelous young people to be successful. The balance of my comments today will have to do only with the details of doing that; the fundamentals are well in hand.

First, you know only too well the challenges we face in recruiting and retention. Compared to other military organizations, *retention of our best space operators is less dependent on the general health of the economy and more closely tied to the extent to which we've progressed into the Information Age.* The space operations skills that were at one time utilized only by the national security and civil sectors are now highly sought by industry. As a result, our military space skills are in

high demand and we see no reason that this will not continue for the foreseeable future. Much like the situation for military pilots, but possessing even more unique skills, military space operators receive lengthy, expensive, and one-of-a-kind training and are now being lured away by the private sector's ability to pay higher salaries and promise less time away from home, offer better health benefits, provide less rigid opportunities for advancement, and, finally, provide a more stable and overall better quality of life. This is true for both our officers and enlisted, but the situation is particularly acute for our mid-level enlisted ranks. The target pay increases you have discussed are directly applicable to my most critical need.

Unless we resolve the pressing concerns of our people, we are in danger of not being ready when called. In the event of a major conflict, it's unlikely that we'll have time to build up skills quickly. We'll need highly trained individuals possessing the right tools from day one. Compensate where we can: incorporate the Total Force to accomplish our missions; partner with industry to improve our processes, build upon each other's successes, and off-load non-core tasks; and employ innovative concepts such as the Expeditionary Aerospace Force. But these concepts only go so far. *The longer-term solution is to give our people the breathing space they need in which to handle today's missions while we concurrently transition to tomorrow's vision.* This translates into better pay and benefits, improved quality of life for members and their families, relief from force reductions, and investments in the tools of tomorrow.

*The Administration and Congress deserve a lot of credit for stepping up to this issue.* Even so, to attract and retain an all-volunteer military, we must do more. When competing with a commercial sector whose compensation, health benefits, and quality of life outpace what we can offer by as much as five times, we must commit ourselves to increasing the incentive to serve our Nation. I strongly applaud your support of a balanced approach to improving compensation by reforming the retirement system, increasing pay, and reforming the pay table.

Our Component Commands, and the Air Force in particular, are making sure we groom the Nation's future space leaders. The Air Force now ensures entry level space technical training for all those entering or transitioning to the space career field. The Army is establishing a space operations specialty. We've also integrated space into our Professional Military Education CORE curriculum across the Services. Armed with people smart on space, we are also working to put the right processes in place in our

acquisition and operations organizations to ensure people get the right leadership jobs at the right time in their careers to groom future space leaders. This will ensure a sufficient number of space officers, a few of whom will go on to become tomorrow's true space generals.

Now, I'd like to tell you about what our people are doing to support the warfighter, some of our key programs, and where we're headed in military space.

### SPACE

It's clear that no credible vision for national security and economic prosperity can ignore the opportunities or the risks associated with exploiting space. In past appearances before this committee, my colleagues, predecessors, and I have shared with you the belief that our way of life is inextricably linked to space. The Tofflers of the world will tell you that how a nation derives its wealth will also indicate when it will go to war. Let me highlight just a few of the staggering facts and predictions that demonstrate our reliance on space:

- Space industries are growing at an annual rate of 20 percent with applications in medicine, transportation, management, surveying, precision farming, and more;
- Since 1996, commercial space revenues outpaced government space expenditures and the gap continues to widen;
- By 2003, we'll see \$16 Billion in Global Positioning System-based revenue alone;
- By 2005, we'll see \$1.2 Trillion in global telecommunications revenues;
- By 2010 there will be nearly two-thousand operating satellites on orbit compared to the roughly 600 today; and
- In 1998, we saw how the failure of just one satellite--the Galaxy IV--disrupted the daily routines of millions of Americans.

From this short list, it's clear that the exploitation of orbital space is driving a new American way of making wealth. *It's also driving a new American way of employing military forces.*

**During 1998, the soldiers, sailors and airmen of USSPACECOM supported 18 military operations and exercises, optimizing navigation support, infrared data, missile warning collection and dissemination, and communications capabilities for our troops.** Operation DESERT FOX, the mission to force Iraqi compliance with United Nations resolutions, offers some typical examples.

Reconnaissance satellites helped identify targets before and assess effectiveness after strikes. Navigation satellites guided our ships to their deployment areas and Tomahawk missiles to their targets. Communications satellites relayed information to our leaders and the strike force as well as news to a worldwide audience. In short, **the successes of DESERT FOX and, for that matter all future military operations, are directly linked to on-orbit assets that are operated by my Component Commanders. They have become the great enablers for the way we execute our military missions.**

Across all military services, **we've had great success integrating space capabilities into daily operations.** A recent example comes from EFX 98, the Air Force's Expeditionary Force Experiment. Because space systems enable reachback concepts, the Air Force was able to deploy more combat teeth to the fight by leaving more of the support tail here at home. Although the scenario year for EFX 98 was set at 2004, the lessons learned from that experiment are changing how our forces view space systems today and how they envision exploiting orbital space tomorrow.

#### PROGRAMS

With that as a backdrop, I'd like to share with you what we're doing in USSPACECOM, the progress we're making on our programs and the road ahead. The men and women of NORAD and USSPACECOM stand ready to perform their assigned missions. As we sit here, our personnel are:

- Monitoring *nearly 9,000 man-made objects* in space;
- Detecting, validating, and *warning of attack* against North America whether by aircraft, missiles, or space vehicles;
- Standing *nuclear alert*;
- Developing plans to coordinate the defense of key military networks;
- Preparing the *next space launch vehicles and spacecraft for launch*;
- Controlling key *on-orbit military spacecraft*;
- Providing *space capabilities* to those deployed forces worldwide at the tip of the spear; and
- Supporting commercial launches/satellite anomaly resolution on a non-interference basis.

They'll continue to do so long after we leave this chamber. The members of USSPACECOM are dedicated to their missions, dedicated to the interests of Canada and our Nation, and vigilant to accomplish implied and directed missions.

## READINESS PROGRAMS

My assessment is that our current readiness remains viable but is starting to show some cracks. We have good news with our Space Liaison Offices (LNOs) and the Joint Space Support Teams (JSSTs) that we regularly deploy to theater CINCS. We're seeing excellent value added and receive a lot of positive feedback from CINCs regarding these teams that provide space support during exercises and contingency operations, and which work force protection requirements and nuclear surety. However, from an Air Force Space Command (AFSPC) perspective, we've recently experienced the lowest-ever reenlistment rates for the security forces protecting the Intercontinental Ballistic Missiles at our northern tier bases. This situation is directly related to the high operations tempo that results from downsizing our force structure while attempting to support both demanding overseas contingencies and CONUS requirements. We have taken steps to minimize the impact of our high ops tempo and to raise retention rates. For example, we're providing family time for those returning from deployments and adding Readiness Non-Commissioned Officers to help individuals cope with deployments. We've also raised reenlistment bonuses for 41 Air Force skills, increased the role of the Guard and Reserve, and funded improvements for housing and base facilities. The Air Force has also increased AFSPC Security Police's manning in 20<sup>th</sup> Air Force. The unique problem we face within the Command is trying to balance our responsibility to support overseas force protection requirements and nuclear surety at home. This no-win situation is stretching our security force to the near-breaking point.

The Committee knows, every military operation from humanitarian relief to punitive strikes to full-scale combat depends upon space systems. ***Space capabilities are so integral to successful operations that we will never again execute a contingency operation or war plan without the benefit of the space-based systems*** providing weather, warning, navigation, communication, and intelligence information. When we speak of the readiness or hollowness of our military forces, we must realize that the pervasiveness of space capabilities demands that they be among the first to undergo a litmus test before making the call. Simply put, US military power and agility are directly reflected in US space power.

Some specific programs or projects of interest to current readiness include Y2K, antiterrorism and force protection, SATCOM,

*the Global Positioning System (GPS) and Frequency Spectrum issues. I'll briefly discuss each.*

For some, January 1st marked the beginning of the countdown to the millennium rollover. We, of course, were long ago hard at work identifying and testing systems, meeting directed timelines, and reaching the recommended level of confidence for Y2K compliance. I'm pleased to report that nearly all our mission critical systems are compliant. Those remaining will be compliant later this year.

### **Y2K**

You can be assured that **Y2K** has the undivided attention and personal involvement of all our commanders. For us, this isn't just a technical issue; it's a warfighting issue for which we know the exact time of attack. That's why Secretary Cohen gave the CINCs the responsibility for testing and evaluating Y2K system compliance. Our focus during 1999 is to conduct Operational Evaluations (OPEVAL), placing strings of systems in a Y2K environment while executing operational scenarios. Note that these are not stand-alone tests--they are major systems tests, end-to-end capability tests designed to determine if we are able to accomplish our warfighting missions. The DoD's first Y2K OPEVAL was conducted by NORAD, USSPACECOM, and USSTRATCOM in early December 1998 and focused on the missile warning mission. Independent observers scored this three-day collaborative effort as a resounding success that sets a high standard for all subsequent OPEVALS. We'll conduct four more OPEVALS in the coming months plus we'll support several other CINCs during their evaluations. My confidence on this issue stems not only from our complex tests, but also from the fact that our people are the world's best trained and most professional.

### **Antiterrorism and Force Protection**

**Antiterrorism and force protection** continues to be one of our priority concerns. We pursue information, assess vulnerabilities, and modify the way we do business. Our progress has been solid, but this is an area in which we cannot be totally satisfied. Thus far, we've conducted vulnerability assessments at all our major installations, reinforced security at our Headquarters buildings, and will soon modify our public tour program for Cheyenne Mountain. But we have some lingering concerns, concerns that represent low cost, high return techniques for terrorists. We have limited ability to detect and are thus vulnerable to chemical and biological attacks. Additionally, our critical

infrastructure, for example, our satellite control facilities and mobile ground terminals, are vulnerable to terrorist attack. To mitigate the effects of terrorist attacks, we must remain vigilant and ensure the mission is accomplished. We must continue to train our personnel, execute random antiterrorism measures, pre-position physical security devices, and exercise our disaster response plans.

### SATCOM

There is strong agreement within the DoD on the future course of action for SATCOM activities. These activities provide the architecture that will satisfy warfighter needs into the 21<sup>st</sup> Century. However, without continued support, not only will existing systems become obsolete, but also newer, more capable systems will not be in place to satisfy the ever-increasing information needs of tomorrow's warfighters.

Current DoD-owned SATCOM systems need to be replaced in the 2003-2006 timeframe. Last year, the Joint Requirements Oversight Council (JROC) approved the SATCOM Capstone Requirements Document (CRD) outlining DoD's overarching needs for satellite communications. It's clear that the DoD will continue to invest heavily in precision warfighting and combat support systems that rely on space-based systems for their information. We plan to use commercial systems whenever possible to meet these requirements. We are already incorporating commercial technology into DoD systems, where feasible.

The Defense Satellite Communications System (DSCS) is one of the DoD's primary transmission paths for priority long-haul communications. We recently completed modifications to heavy and medium Earth terminals, but we'll also need to upgrade or replace many of our terminals. Additionally, in 2004/2005, we plan to launch three commercial-like wideband satellites to increase throughput and extend the capability provided by the existing DSCS constellation. These satellites, focused on supporting deployed warfighters, will supplement the remaining DSCS constellation, augment the Global Broadcast Service (GBS) capability on the Ultra High Frequency Follow On (UFO) satellites and provide our first two-way Ka capability. This gap filler plan, when implemented, will give DoD a dramatic increase in tactical wideband capability two years earlier than the system originally envisioned, and allows us time to assess the performance and cost of emerging commercial services.

We'll stay the course with Milstar for our protected requirements. Our Milstar system is a critical DoD system that provides survivable communications for strategic and tactical command and control, provides jam-resistant, low-probability-of-detection and interception communications, provides satellite crosslink to move mission data between theaters, and allows satellite command and control without reliance on ground relay stations. Within the next three years, we'll reach our goal to transition all satellite survivable, protected communications to Milstar. Additionally, we'll continue to expand tactical utilization of Milstar as users field more terminals. We continue our work with users on alternatives to accommodate the growing requirements of non-tactical users and intelligence activities.

We've begun documenting operational warfighting requirements to acquire Milstar's successor called the Advanced EHF Satellite Communications program projecting service beginning in 2006.

For mobile users, the Navy has begun the work for a mobile user objective system to replace the current UFO constellation in 2007. In the near-term, we are working to meet today's increasing requirements with emerging commercial Mobile Satellite Services (MSS) systems.

### **GLOBAL POSITION SYTEM (GPS) AND FREQUENCY SPECTUM**

Turning to our navigation and timing responsibilities, the Global Positioning System (GPS) is a huge success story for this Nation and the international community. It is vital to our National security and public safety, and is increasingly an engine for economic growth. As you know, we are attempting to modernize GPS in order to minimize vulnerabilities while enhancing capabilities. Success in our endeavor will spur additional growth in GPS applications, and will ensure continued US preeminence in satellite navigation and timing. It is in our Nation's interest to ensure GPS remains robust; it is a critical force enhancement tool for DoD and our Allies, and it is quickly becoming integral to international transportation and timing infrastructures. Enormous benefits have accrued to this Nation because GPS is the international standard for satellite navigation and timing. However, we face many near-term challenges in realizing our goals.

First, let me address an issue associated with implementing the third civil GPS signal as part of our overall GPS modernization initiative. DoD operates several systems, including the Joint Tactical Information Distribution System (JTIDS), on a non-interference basis in the frequency band identified for this



signal. Other systems such as air navigation aids, terrestrial communications, and air surveillance radars for the defense of this country also have emissions in the band. The White House has directed DoD and the Department of Transportation to make every effort to find technical and procedural solutions that will allow GPS and existing authorized DoD systems, including JTIDS, to coexist in this band without causing harmful interference to civil aviation and other transportation safety users, and to try to reduce or eliminate any cost or operational impacts on these military systems. If this effort is not successful, DoD believes the costs of vacating the frequency could be as high as \$1B, not including the costs that other nations might incur to remain interoperable with DoD. In addition, we believe DoD could lose operational capability. We must therefore continue to intelligently balance the needs of DoD with the needs of the civil GPS user community.

Second, we are upgrading our GPS ground control system to accommodate future growth and compatibility with the next generation GPS satellite, the IIF. Through the IGEB, DoD is working closely with the Department of Transportation (DoT) and other civil agencies to plan future modifications to meet both military and civil requirements. The two new civil signals and the enhanced military signal will be added to the next generation of GPS satellites, referred to as the Block IIF satellites. Although the DoD Joint program office will implement the new civil capabilities, funding will be provided by civil agencies. The FY00 DoT budget includes funding to begin these efforts. The successful execution of this upgrade is absolutely essential to the sustained health of GPS from 2003 and beyond, and is also critical to GPS Modernization. We must mitigate the substantial risk inherent in a transition of this magnitude. The USAF is diligently working the solution; I have full confidence they will succeed.

Third, it is our intent to discontinue Selective Availability (SA) by 2006. SA is the means by which DoD degrades the accuracy of the civil GPS signal. The purpose in degrading the civil signal is to deny to our adversary's precision targeting capability. Beginning next year, the President will make an annual determination on the continued use of SA based on an assessment and recommendation by DoD in cooperation with DOT and CIA. Already, there's growing pressure from the civil and commercial sectors to accelerate SA termination. But I must say that doing so could provide additional incentive for potential adversaries to exploit GPS. We must support fully our Navigation Warfare (NAVWAR) program, which seeks to protect the signal for

our use, while denying it to our adversaries. This problem will grow ever more pressing as the threat matures, and as we add additional civil capabilities to GPS, enabling friend and foe alike accuracy hitherto preserved for DoD and authorized civil users. As we attempt to balance the needs of all sectors for this emerging global commodity, we must ensure our military forces retain a warfighting advantage.

We need strong support in preparing for the upcoming World Radio Conference (WRC) 2000. As you know, competition is keen for any electromagnetic spectrum, and the L band, where GPS resides, is no exception. Protecting GPS spectrum not only reduces the possibility of interference, but also preserves options to grow GPS to meet 21<sup>st</sup> century needs. I am encouraged by the early appointment of an ambassador to spearhead US Government efforts, and assure you that we will push to ensure GPS remains the preeminent satellite navigation standard globally.

Of course, GPS represents the tip of the iceberg in the realm of national and international spectrum management. In the past year, we've made some headway in balancing our equity in the government versus private sector spectrum environment. However, we must continue to ensure sufficient radio frequency spectrum to operate. One key element of risk to assured frequency access is the series of public spectrum reallocation auctions conducted by the Federal Communications Commission. Although spectrum reallocations can meet an immediate fiscal need, they could come at the expense of systems we have become dependent upon to protect the Nation such as early warning radars, space, surveillance and sensor systems. In almost all cases, these functions are performed in spectrum uniquely suited by the laws of physics for specific missions. Reallocations are causing an impairment of our ability to protect, train, and fight and unplanned reallocations without adequate review could lead to serious operational consequences due to lack of bandwidth. As the private sector continues to influence the national and international regulatory processes, we continue to work with the private sector and other government users for a national spectrum policy that will ensure equitable access by all. We cannot remedy our losses in the near term or achieve Joint Vision 2010, in which we pledge information superiority to the warfighter, while incurring unplanned losses of this critical finite asset.

Future international spectrum reallocations and US should take into account our national security needs for assured spectrum access, not only for our forces, but also for our partners and coalition partners as well. As an example, spectrum reallocation

is one mechanism the mobile satellite services industry uses to gain access to specialized bands for the sake of generating revenue. Recently, the Global Positioning System frequency allocation was at risk of incursion by the mobile satellite service industry at the World Radio Conference in Geneva. The mobile satellite industry sought world support to reallocate the GPS flight safety band to accommodate consumer mobile telephone services. The White House and Secretaries of Defense, State and Transportation postponed this effort only through last-minute efforts. This shows how a National asset can be put in jeopardy through consequential actions of well-intended legislation.

When we were forced to give up 235 MHz of spectrum under Omnibus Budget Resolution Act (OBRA) of 1993, we had to absorb spectrum losses and re-engineer equipment to meet our mandate to maintain national security. Fortunately, legislation was passed last year in our Authorization Bill which provided the authority for the Federal government to be reimbursed for certain spectrum in the 235MHz reallocation and any further spectrum reallocated from Federal assets to the private sector. There is no virgin spectrum that our systems can easily move to, nor is there any spectrum we have at present that can be given up without severe degradation to our National Defense. Therefore, I strongly recommend that Federal government spectrum assets managed by the National Telecommunications and Information Administration (NTIA) be fully protected if we are to sustain our National Defense and other critical U.S. operations including law enforcement, air traffic control, natural resources management, and other public safety services.

Finally, in light of increased civil use of spectrum, spectrum reallocations for civil use should be structured to minimize out-of-band interference between Federal and civil radio frequency users. The bottom line is that we must develop an equitable long-range spectrum strategy based on warfighting requirements and civil needs. Any future spectrum reallocation must fully consider the national security operational impacts and appropriate cost reimbursements. We will endeavor to assure that the Federal spectrum reallocation process will incorporate these impacts in a timely fashion to eliminate or minimize any adverse national security impacts.

#### **MODERNIZATION PROGRAMS**

We're very concerned about modernization--our future readiness. Cuts in modernization investments hit future space capabilities especially hard. Ultimately, the impact will be felt

throughout the military. For example, the entire military is moving toward a common view of future warfare. The goal is to increase combat effectiveness and reduce casualties by employing a smaller, more maneuverable, more lethal force structure. This apparent paradox is resolved by using information gathered from and disseminated by space systems to create unprecedented battlespace awareness and by inspiring and exploiting revolutionary employment concepts and capabilities. This is the promise of space as envisioned by Joint Vision 2010, the Quadrennial Defense Review, the National Defense Panel, and many others. The chasm between the promise and capabilities today is deepened by the fact that we reduced the size of our force structure a decade or two before the enabling space systems will be on line. We must come through on space modernization.

With the recent debate that we're returning to the days of the hollow force, we may overlook the possibility that we may instead be creating a dead-end force, a force that's headed nowhere and will be irrelevant in future conflicts. Reacting to worldwide crises and subsequently diverting modernization investments to fund today's readiness may allow, in the worst case, our forces to slowly but surely become obsolete, to become irrelevant in a new era of warfare. Having a ready force equipped with yesterday's tools is unlikely to win tomorrow's conflicts. Instead it will be stuck in a dead-end. Modernization prevents this. Our space systems modernization list includes many priority projects. I'll cover some that are at the top of the list.

### SBIRS

As USCINCSpace, my number one priority is the Space-Based Infrared System (SBIRS). SBIRS will provide missile warning, missile defense, technical intelligence, and battlespace characterization. It's not just we at USSPACECOM who say this system is critical to mission success. As the point man for advocating the space needs of all CINCs, I can assure you that it's the warriors in the field who need SBIRS soon. We need SBIRS soon, but more pressing force readiness needs have resulted in a delay of the program. Two-year delays were directed for the Mission Control Station Back-up facility, SBIRS High (Geostationary Earth Orbit), and SBIRS Low. The impact of these decisions is that our military forces must continue to rely on Defense Support Program satellites, for another two years that have a limited capability against emerging theater ballistic missiles. Recent TBM launches by North Korea, Pakistan, and Iran should leave no doubt of the validity of this threat.

Associated with SBIRS is another promising missile warning capability called the Theater Airborne Warning System (TAWs), which fuses space-based infrared and airbreather infrared data to improve theater warning time and launch and impact predictions. We have been working TAWs as technology proof-of-concept for the last few years, culminating with a live-fly demonstration in November 1999. The development work with the TAWs fusion engine provides a pathfinder for SBIRS Low technology. TAWs can improve theater missile defense capabilities by putting more sensors on the mobile missile problem and could be fielded today if funding were available.

**MISSILE DEFENSE**  
**NATIONAL MISSILE DEFENSE AND CRUISE MISSILE DEFENSE**

The next modernization issue I'll discuss is Missile Defense. We continue to participate in the planning process for the Ballistic Missile Defense Organization's National Missile Defense (NMD) Program. We have developed an NMD Concept of Operations (CONOPS). We're examining existing and projected Integrated Tactical Warning and Attack Assessment (ITW/AA) sensors to detect hostile missile launches. Centralized command and control will be handled at the Cheyenne Mountain Operations Center with the NMD site as a backup. We continue to refine our NMD CONOPS through annual Command and Control Exercises, which allow us the opportunity to validate or change the employment procedures for the NMD system. Some key challenges lie ahead. We firmly believe the evolving threat is one of our most critical issues. We must field a capability against the right threat. We are working hard with BMDO, Components and our Services to ensure the NMD system possesses the capability to meet the needs of our Nation. Another challenge is to ensure the capability that SBIRS provides is available when needed. Looking at a potential initial operational capability for NMD in 2005, we will work to ensure the best program for our Nation.

Following closely at the heels of NMD is our need to defend against cruise missiles. The recently released Rumsfeld Report predicts that the cruise missile threat against North America will emerge much sooner than previously expected. As protectors of North America, we must begin now to identify how we will protect our citizens from incoming cruise missiles. Fortunately, our Theater and National Missile Defense efforts provide a good foundation upon which to build. However, defending against cruise missiles provides new challenges that are uniquely different from Theater and National Missile Defense. For example, some of the more difficult tasks include surveillance and cueing. The small

radar and infrared cross-section of cruise missiles make detection and shutdown very difficult.

A Space-Based Radar (SBR) is one technology we're evaluating as an answer to development and proliferation of cruise missile technology. The ability to track low-flying, maneuvering aircraft from above may provide us the best means for countering this growing threat. As we prepare for the future, we must rally the missile defense community around a single focal point to address Cruise Missile Defense issues. I also see a Space Based Laser (SBL) system as a critical component of a layered, integrated space and ground defense capability. The SBL system could be the first tier of National and theater missile defense by engaging ballistic missiles in the boost phase of their flight. An In-Flight Experiment (IFX) in the 2010-2012 timeframe is also vital to explore the necessary technology for the SBL system, as well as the capability to perform non-Ballistic Missile Defense (BMD) missions. I believe an Initial Operational Capability in the mid to late 2020 timeframe for the operational SBL constellation is necessary to achieving our goal of an integrated space- and ground-based Ballistic Missile Defense capability.

#### Shared Early Warning

Another important missile warning area of concern is **Shared Early Warning (SEW)**. The initial SEW policy was approved by the Secretary of Defense in November 1994 and updated near the end of 1998. We've started addressing the needs of this evolving mission area. During the budget review, the Deputy Secretary approved the establishment of SEW funding for four priorities:

- Center for Year 2000 Strategic Stability (proposed for Colorado Springs);
- Integrated Logistics Support for the Year 2000 Center, the Joint Warning Center in Moscow, and existing SEW sites;
- Required Documentation; and
- Expanded Pre-launch Regime

The funding also establishes a central program office. I expect that in the future the lack of standardized equipment; centralized integrated logistic support; system training, system maintenance, trouble-shooting and repair; and research and development will inhibit the theater CINC's ability to ensure voice and data warning information is reliably and consistently provided to the lowest echelon within each theater. **The two most pressing operational problems are architecture standardization and timeliness and reliability of voice and data information.** We will

probably need additional investment to complete the recovery from these problems. Despite these challenges, interest in SEW remains high; during the past couple of years, many countries have expressed interest in SEW. We expect SEW's importance to deployed forces and allies to continue to increase.

### GBS

One of the very promising satellite communications programs for the future is the **Global Broadcast Service (GBS)**. This represents an instance where we in the military followed commercial sector advancements. GBS will augment current wideband systems and provide high volume one-way communications to deployed forces. We'll be able to quickly disseminate large bandwidth products such as imagery, videos, and air tasking orders to forces in theater. In the next two years, GBS packages will be on-orbit via the Navy's UHF Follow-On satellites and the majority of receive suites will be in operation.

### PARTNERING

We continue to work closely with the National Reconnaissance Office (NRO) and the intelligence community in several key areas. The ability to task, process, disseminate and exploit intelligence information to the right person at the right time is key to our future information superiority. Here's a sampling of our current efforts:

- We're working on several short- and long-term initiatives to provide imagery and geospatial information to the warfighter;
- We're actively involved in assessments and plans for space-based hyperspectral imagery;
- With the unequivocal support of Keith Hall at the National Reconnaissance Office, we're working hard to provide "one-stop-shopping" for the warfighter by melding black and white space programs.

Emerging technologies allow us to consider *migrating* some of our military's terrestrially based capabilities to space-based systems. We want to look at migration from an effects viewpoint (to determine the desired effects/mission, and the correct terrestrial/space mix). Our relationship with the NRO has matured over the last couple years, and I'm happy to report several successes out of this partnership:

- We've virtually linked our operations centers, even though they're two time zones apart. The result is a space common

operating picture to better support all our customers:  
military, national and civil agencies

- We're continuing in our personnel crossflow activities. Mr. Hall and I both agree that a career space officer needs the breadth that transcends both our organizations. Our future space generals will speak black and white space
- Mr. Hall and I have been traveling to each of the unified commands together. This gives us the opportunity to show each command how space is influencing their UCP responsibilities, and we get invaluable feedback from them to better do our jobs
- We've been collaborating on Title X wargame support with very positive results. We've also cosponsored space modeling and simulation symposia. We need better decision tools to ensure space is fairly evaluated for investment trade-offs made in the upcoming quadrennial defense review.

Mr. Hall and I fully intend to continue looking for areas of mutual benefit, for the good of the space business and our national security.

Another developing partnership is our work with the National Imagery and Mapping Agency (NIMA). Our Command is fully engaged with LTG King's staff to ensure our tasking, processing, exploitation and dissemination (TPED) capabilities stay apace of the collection assets. We fully support NIMA's approach to a Commercial Imagery Strategy and a TPED Modernization Plan. These efforts, along with the NRO's Future Imagery Architecture, will be essential to the transparent battlespace envisioned in our Long Range Plan.

### **Spacelift**

Getting our advanced space systems to orbit requires modern launch ranges and reliable spacelift. It's well known that our launch ranges at Vandenberg Air Force Base and Cape Canaveral Air Station are in dire need of upgrading. In some instances, the same equipment that was used to help place John Glenn in space in the early 1960s was used to place him in space in 1998. Because we're relying on obsolete technology, confidence in launching on time is decreasing. This is directly affecting turn-around time and capacity. Most of the primary instrumentation was built in the 1950s and 1960s. To modernize the ranges to support our most critical needs, we must protect our current modernization plans by keeping our investments on track. As we move toward the future with significant increases in the numbers of commercial launches, coupled with significant investment in the EELV, we need to



examine as a nation how to best operate the launch ranges in the future. The White House is planning to initiate an interagency review in the very near future to explore this important area.

Our current launch vehicle fleet is serving today's needs, but we're well along in our plans to provide advanced spacelift capabilities for the 21st Century. **The Evolved Expendable Launch Vehicle (EELV) went on contract this past October. EELV promises to reduce the cost of access to space and to increase US spacelift flexibility and responsiveness.** This program is an excellent example of the military partnering with industry to provide advanced capabilities for our Nation. Between 2002 and 2006, in addition to serving the needs of the civil and commercial sectors, the EELV will provide launch services for 28 DoD launches.

**In another partnering effort, we're working with the National Aeronautics and Space Administration (NASA) to build upon their progress with reusable launch vehicles.** We've already written a concept of operations for a system-of-systems program. Our plans include three key components: a Space Operations Vehicle (SOV), a Space Maneuver Vehicle (SMV), and a Modular Insertion Stage (MIS). The SOV is a CONUS-based, multi-mission, quick-turn, reusable medium lift space vehicle with two flight profiles: pop-up and orbital. The SMV will be a small, maneuverable, reusable orbital vehicle that carries multiple sensors and payloads and is released from the SOV. The MIS will be a small, expendable upper stage attached to the SOV for boosting payloads into operational orbits. We're currently working on a roadmap, partnering with NASA on technology development, conducting military utility and worth studies, and developing and SMV concept of operations. At the current time, we are provide some funding to NASA as our contribution to NASA's Future-X Pathfinder.

### SPACE CONTROL

Finally, the Space Control mission areas continue to grow in importance each day. We're working with a number of agencies to provide the capabilities we'll need in the coming decades. We're working with the Army and the Air Force on their activities to address approved joint requirements.

I'm pleased the Air Force recently established a new program element (PE) for Space Control to help us address counterspace technology development. This Space Control PE implements a National Space Policy Presidential Directive to:

- Deter, warn, and defend against enemy attack;

- Assure that hostile forces cannot prevent our own use of space;
- Counter space systems and services used for hostile purposes; and
- Ensure our ability to conduct military and intelligence space activities.

The PE includes prototyping, modeling and simulation, system engineering, exercises and training, support equipment, and technology demonstrations.

Before leaving our modernization discussion, it's important to keep in mind that modernization extends beyond equipment. We must also modernize our thinking. We cannot gain the support of the American people if we cannot debate our issues to the average American. A recent study by the National Defense Industrial Association showed the need to continue the DoD/Industry dialogue of the common ground for DoD and commercial satellite protection. The dichotomy here is that while many believe there's no present danger, to be prepared for the threats that are emerging we need to prepare now. Advanced capabilities can take a decade or more to field. We cannot be late in protecting key on-orbit resources.

#### THE ROAD AHEAD

While USSPACECOM has the fewest personnel of all the Unified Commands, it's responsible for some of our most important missions. Our three interdependent mission areas--Space Support, Force Enhancement, and Space Control--build upon each other to place advanced capabilities directly into the hands of our fighting forces. As our military forces strike terrorists or prepare for Major Theater Warfare, they look to the "dark beyond" for the signals intelligence, imagery, navigation signals, weather reports, threat warning, communications connectivity, targeting assistance, and damage assessments that ensure mission success.

Heralding our senior military leaders' foresight, when Unified Command Plan 1997 was promulgated in early 1998, *USSPACECOM was assigned five additional responsibilities.* Recognizing the rapid international drive to exploit orbital space for commercial and military gain, we were:

- Identified as the single point of contact for all military space operational matters;
- Directed to interface with National, commercial, and international agencies;
- Directed to conduct space campaign planning;

- Directed to plan and implement security assistance activities; and
- Directed to counter the deployment of weapons of mass destruction to space.

Assigning these additional responsibilities was accomplished at the most propitious moment in time and was clearly right for our Nation.

While USSPACECOM was assigned the new mission responsibilities mentioned earlier, no additional manpower resources were included in the package. It would be difficult to absorb the workload into a headquarters that is already the smallest of the Unified Commands. Clearly, we need to fund the manpower resource increase to support these new critical responsibilities or acknowledge the increased risk to the warfighter. Any additional downward-directed manpower reductions would intensify an already critical situation.

Additionally, as we ever more quickly shepherd the world into the Information Age, our constant use of space and information systems allows us to globally connect with friends and allies-- but it also exposes us to new vulnerabilities. Because of rapid advances in communications technologies, we continue to shrink the distance that separates the peoples of the world. You know as well as I that the worldwide web, the internet, allows ready and rapid access to mountains of information. As has been the case throughout history, each tool created to benefit mankind is simultaneously turned into a tool to disable. Our information systems haven't altered that history.

Information Operations is as much a fact of life as is reading of daily events. The moment we linked our computer systems, those wishing to betray our government, break into our security systems, or simply take a cyberspace joy ride began looking for cracks in our armor. Our information systems, our unclassified networks, are under constant attack, being probed for weaknesses every minute of every day. The perpetrators are not amateurs; they can be quite savvy. They blur their trail by sequential taps into disparate nodes. By hopping along on links owned by friend and foe alike, our ability to trace them to their original source becomes nearly impossible. Whether they are young cyber hooligans or malicious adversaries, all threaten American security and the American way of life. We believe it's only a matter of time before they successfully penetrate the thick walls surrounding our secure systems. All this activity, all this probing, is evidence of the asymmetric warfare being waged against

our National interests. This is not a future threat--it's a current threat that only promises to worsen in the future.

For these reasons, we believe it is imperative to identify the organizational structure best suited to defend our information networks. We've already taken some preliminary steps. It's time for the next major step. It's time to place all computer network defense and attack responsibilities under one Information Operations umbrella, under one Unified Command. It's time to devote the appropriate level of resources to defend our precious space and information assets. It's time for us to guide and protect our Nation from emerging space and Information Age threats.

Our global mission perspective and our experience and responsibility with Space Control make USSPACECOM the logical steward of our Nation's computer network operations. We envision being given responsibility for the Computer Network Defense mission by 1 October 1999 and assuming responsibility for the Computer Network Attack mission by 1 October 2000. We have already stood up a small activation task force to identify, plan, and coordinate the organizational structures, partnerships, and key tasks needed to provide a coordinated capability to all supported CINCs.

#### LONG RANGE PLAN

As our armed forces continue to adapt to changing security environments around the world, I'm confident we're on the right track to meet any emerging challenge head on. There's no doubt in my mind that America will continue to have the best trained, most competent and most lethal fighting force in the world.

Many parts of our National security structure are working through what some have called a strategic pause, an opportunity to examine our strategies at a time when our Nation's security is not directly challenged. This self-examination is underway to ensure that our nation emerges from the pause properly postured to secure our interests. In most cases, there is a legacy of past experience that can positively contribute to orienting our organizations to the future. We in the space business, though, find ourselves at a time unlike any other in history. For what we see beyond the horizon in space, our forty years of experience cannot light our path to the future. We've never been here before. As we stand today secure on the top of the highest vantagepoint, we see multitudes of other climbers coming our way. Couple the explosive commercial expansion to space that is

underway at full throttle with the broad and ever growing hunger for and access to space products, all fueled by extraordinarily rapid technological change, and you have an unprecedented moment in our history. From Iridium telephones connecting people anywhere on the globe to commercially available 1-meter resolution imagery, we are beginning to share the high ground of space. There are risks inherent in this condition, and there are opportunities.

During last year's testimony, we unveiled the USSPACECOM Long Range Plan. This plan, which I feel is a tremendous piece of work and major contribution to our Nation's body of strategic thinking, is USSPACECOM's deliberate effort to extend the National defense planning horizon and ensure military space is postured to exploit future opportunities and meet future challenges. It is the beginning of an urgent effort to get the future military space piece right, and we are committed to ensuring the success of our plan.

I want to provide an update on the progress we've made:

- While I'm satisfied we've set the right course, I wanted to ensure the strategic planning process was in place to sustain the Long Range Plan. One of the first things I did as USCINCSpace was to formally integrate all aspects of our strategic planning system. We've reorganized the headquarters staff to better focus on ensuring we're doing the things today that will get us the capabilities we need tomorrow. I can report to you today that USSPACECOM priorities and future requirements are all connected to the Long Range Plan.
- The USCINCSpace Integrated Priority List that I submitted to the Joint Staff in December was compiled across all the CINCs and vetted within our strategic planning framework and is consistent with the Long Range Plan.
- We've begun to synchronize and harmonize the headquarters strategic planning process with the planning processes of our Components--Army Space Command, Naval Space Command and 14<sup>th</sup> Air Force--in an overarching effort to maximize our influence on service budgets.
- In an attempt to secure even greater unity of effort in the military space business, we're in the process of automating our plan and process to help us track our progress, and continually get more granularity into our effort. We think

this work will be useful across our space community, so it's our intention to share this information as broadly as we can to help us harness the energies of the many organizations that will enable us to do our job. This past winter, in a partnership led by the National Security Space Architect, we participated in an effort to figure out the best way to get broad insight across our community. Though USSPACECOM has a principal role leading the evolution of space power, we know full well we aren't the organizers, trainers and equippers. Our ultimate goal is to share the broadest insight possible into our respective initiatives, betting that this kind of connectivity will produce a synergy that can only serve to benefit our Nation.

- My staff is hard at work building a Global Theater Engagement Plan to further unify our efforts with shaping space. It will provide a better framework for us to integrate space as a combat multiplier for theater CINCs across the full spectrum of conflict. This plan will be borne of our Long Range Plan and will be an extremely valuable instrument in helping us shape the region of space and achieve our Vision for 2020.

I find strong support from the other CINCs for the exhaustive process we have in place to consolidate requirements and get urgent visibility of warfighter needs. Though there are many areas where we continue to strive to improve, my personal interaction with the other CINCs confirms for me that we have the right sight picture on what is needed today and what we must deploy tomorrow.

Enhancing space power, though, takes both time and National commitment to stay abreast of rapidly accelerating technological change. Today's investment decisions will result in some systems that will still be around in 2020. While that notional development, procurement and deployment timeline is not uncommon with combat aircraft, the space business is very different. Unlike making improvements to the B-52 that will enable it to fly for perhaps 80 years, *we currently lack the economical capability on a broad scale to retrieve satellites to upgrade them; what you deploy is essentially what you're stuck with for the duration of its fielded life.* In many cases, the only way you improve the capabilities that keep our forces protected, connected and postured for success in combat is by launching new, better satellites. *Given the recurring costs of these procurements and related support, we will continue to depend on a strong, coherent long-term game plan to assure effective combat operations.* I'm

*satisfied the strategic planning process on-going at USSPACECOM will contribute directly to achieving our Vision for 2020.*

### **CONCLUSION**

As you can tell, our sights are set high and our future is bright. As we transition into the 21st Century, we'll continue to grow to fit our Nation's needs. We would ask Congress to provide the robust and stable funding that the Administration has requested in this extremely important issue.

As our armed forces continue to adapt to changing security environments around the world, I'm confident we're on the right track to meet emerging threats. We'll continue to have the best trained, most competent, and most lethal fighting force in the world. We in the space business find ourselves at a unique point in history. Today, we remain the premier space faring Nation but multitudes are seeking the advantages of space systems. Coupled with the explosive rate of commercial exploitation, it's clear that our work is cut out for us. We must continue to invest in the capabilities that will keep this Nation in its position as the world's space leader.

All of us in NORAD and USSPACECOM are committed to enhancing the security of our Nation and Canada by helping achieve the capabilities envisioned in Joint Vision 2010. We're committed to placing advanced warfighting capabilities directly into the hands of future warfighters. With your continued support, we'll continue to meet the responsibilities we've already been given and aggressively seek to meet those of tomorrow.