

House Armed Services Subcommittee on Strategic Forces Holds Hearing on FY2005 Budget: Defense Strategic Forces Programs 25 February 2004

EVERETT:

The hearing will come to order. The subcommittee will meet today to receive testimony on the Department of Defense space programs and the fiscal year 2005 budget request for space activities. I want to welcome Undersecretary Peter Teets who is testifying today as the head of National Security Space Programs.

I also want to welcome, seated behind Secretary Teets, the Service Space Program heads: representing the Air Force, General Lance Lord, Commander, Air Force Space Command; for the Army, Lieutenant General Larry Dodgen, Commander, Space and Missile Defense Command; the Navy, Rear Admiral Rand Fisher, Commander, Space and Naval Warfare Systems Command; and finally Brigadier General John Thomas, Director of Command (C4), and Chief Information Officer for the Marine Corps. Welcome all.

Following Secretary Teets' remarks, I invite you to join him at the witness table as committee members ask questions.

We have a great deal of ground to cover today, and I want to allow each of our members as great an opportunity as possible to ask questions, so I will be brief. Likewise, I would ask you, Mr. Secretary, to be brief with your opening and prepared remarks -- the entirety of your written statement will be entered into the record.

This is the second gathering of this panel, led by Undersecretary Teets. He is the first person to serve as overall head of National Security Space Programs. Consolidation of space activities under a single executive agent was a strong recommendation of the Space Commission. On the one hand, the secretary oversees an area of technology that is rapidly growing in importance, and on the other hand, he has inherited many space programs that have experienced cost growth and schedule delays. These issues are of paramount concern to this committee and this Congress as an institution.

When we last met, one year ago, we were at the lessons learned stage coming off of a major conflict: Operation Enduring Freedom in Afghanistan. Now, we've come full circle and have further applied these precious space resources to another conflict, Operation Iraqi Freedom. Our success in these difficult missions would not be possible without the space-based capabilities used by the witnesses who appear before us today.

The secretary faces the institutional hurdle of better integrating military and intelligence community space activities, which promises to benefit both user communities, as well as provide more valuable service to the taxpayer. Are we using these resources to the best of our abilities, and if not Mr. Secretary, I would ask you today, how is it that the Congress can help you use them better.

Further, Secretary Teets is faced with the difficulty of maintaining assured access to space while transitioning from legacy space boosters to the new family of Evolved Expendable Launch Vehicles. It comes at during a period when reduced commercial launches places added financial pressures on both suppliers.

Finally another challenge, highlighted almost daily in the press, is the planned transition from existing space-based communication systems to a new transformational communications system based on laser interconnection. This system is to provide the increased information handling capability our future forces require.

The bottom line is that it is very difficult to see how, with the constrained resources available, we will be able to adequately fund maintenance of existing capabilities while fielding Future Imagery Architecture and developing expensive future systems like Space Based Radar and the transformational communications satellite system.

At this time, I would like to recognize my friend and my ranking member, Mr. Reyes, for any comments he may have. REYES: Thank you, Mr. Chairman. I want to join you, Mr. Chairman, in welcoming our distinguished witness, Undersecretary of the Air Force, Mr. Teets. And I also want to welcome the top military officers on matters -- on space matters from each of our services. We appreciate your service and the service you provide our country and we particularly appreciate you taking time from your busy schedules to be here with us today.

Space assets have become vital to our war fighters. Our command, control and communications systems depend on them. They are critical to the performance of our position-guided munitions. Our various satellite systems provide our warriors in the field, in the air and on the seas with vital intelligence in real time or near real time basis and as we rely more and more on unmanned systems and move to lighter and more mobile units, like our striker brigades on the Future Combat System, secure transmission of accurate intelligence becomes ever much more important.

Clearly our reliance on space will only increase in the future. Our witnesses will present highlights of the 2005 budget in that request. What I hope our witnesses and my colleagues can focus on two programs in particular -- the space based radar, called SBR and the transformational communication system or TSAT. TSAT has entered the design phase and SBR has transitioned in the latter stages of concept definition. In other words, they are moving from being grand ideas that are just primarily in (inaudible) to becoming real live programs.

Not surprisingly, as these programs become more tangible, they become ever more costly. The request for SBRs is \$328 million for 2005, up \$155 million, which is about 90 percent more, from the 2004 level of \$173 million. The Pentagon's cost analysis improvement group estimates that fielding, maintaining and operating a nine satellite SBR constellation with one spare will cost about \$34 billion through 2026 in constant 2004 dollars.

In a nine satellite constellation will not give optimal performance, because there will be gaps in its coverage. Twenty-one satellites are believed to be needed to prevent these gaps, but no cost estimate is available for a constellation of that size to date. Likewise, TSAT promises to be very expensive. The 2005 budget request for TSAT is \$775 million, up \$439 million or about 131 percent from the 2004 level of \$335 million.

No total cost estimate for TSAT has even been worked up by our Pentagon. By highlighting the cost of these programs, I am not trying to imply that we should not be pursuing them. But there is no denying that these costs are significant, even among other things by DOD standards. As SBR and TSAT move closer to downselecting the contracting teams, Congress, I believe has a duty to closely evaluate these programs.

I hope Secretary Teets and our other witnesses pay special emphasis on these programs when laying out the budget request. I also hope our witnesses can talk about what efforts are being taken to reduce the cost of operating in space. In my mind, this involves two parallel tracks -- reducing the cost of launching satellites into space and then reducing the weight of our satellites. The two, I think, are clearly tied together.

I hope our witnesses will describe to us what they are doing to determine whether smaller, lighter satellites are viable alternative to the FATSATs (ph) that we have traditionally become used to and how much funding they are dedicating to these efforts in the 2005 budget.

Finally, I would like to hear more on what we are doing to understand the vulnerabilities of our satellites and what plans the departments may have to put both offensive and defensive weapons capabilities in space. Since we are in open session today, it is not the best day to have that discussion. However, Mr. Chairman, I would like to ask both you and our witnesses to commit to having a closed briefing on these matters prior to markup.

Besides the technology and the cost issues involved, putting weapons, either offensive or defensive into space is a major policy decision. Congress should be a full and equal partner in that decision making process.

Mr. Chairman, I thank you for calling this important hearing, as we have a lot of ground to cover and I look forward to hearing from our distinguished witnesses. EVERETT: Thank you and we certainly will have that closed hearing. I would like to add to that some discussion on GPS and the problem we may be facing with GPS.

This subcommittee saw the wisdom and the full committee, I think add last year, I think it was either \$30 million or \$40 million to kind of jump start GPS-3 and we didn't get that money appropriated. In light of the Galileo coming online, I'm not sure they will get online as quick as they think they will get online, but nevertheless, I think it is important that we again try to jumpstart GPS-3 to cover some of the problems that currently exist in the GS, the current system.

Also I'd like to without objection add to the record a list of civilian uses of GPS, how important not only on the military side, but how important it is to the world we live in.

Mr. Secretary, you are on. I am looking forward to your testimony.

TEETS:

Mr. Chairman and Distinguished Members of the Committee, thank you for the opportunity to appear before you today to discuss the president's budget request for FY 2005 National Security Space programs.

I am particularly honored to be here in the presence of these distinguished military service leaders that are seated behind me. I've worked closely with them over the course of my tenure and I believe that does indeed underscore the importance that we place in jointness in our national security space efforts.

We've worked hard together as a team to define a way ahead that will provide a strong National Security Space Program that meets the needs of all the military services and the intelligence community.

The president's budget request, along with our efforts to develop and maintain our team of space professionals will enable us to sustain America's preeminence in space.

In my multiple roles as the Department of Defense's executive agent for space under the secretary of the Air Force and the director of the national reconnaissance office, I have set five priorities for our national security space efforts for 2004.

They are, one, achieving mission success in operations and acquisition; two, developing and maintaining a team of space professionals; three, integrating space capabilities for national intelligence and war fighting; four, producing innovative solutions for the most challenging national security problems; and five, ensuring freedom of action in space. These priorities have shaped the FY '05 budget for our DOD space programs and I see substantial improvement in capabilities in every mission area as we recapitalize our space assets in the years ahead.

The funding requested in the president's budget in FY 2005 allows us to evolve capabilities in current constellations while planned investments in new systems will

provide significant increases in performance, supporting the full range of intelligence and military operations to include the global war on terrorism.

We are aggressively pursuing two major initiatives that will deliver transformational capabilities to military and intelligence operations. First, the transformational communications architecture will provide vast improvements in data rates, expanded accesses, communications on the move and Internet protocol based connectivity.

As a part of that architecture, TSAT will be a revolutionary change in satellite communications for the war fighter and for national intelligence users and is an enabler of horizontal integration, allowing our fighting forces to have near real time intelligence, surveillance and reconnaissance at their fingertips. TSAT will provide an unprecedented connectivity with Internet like capability that extends the global information grid to deployed and mobile users worldwide and will deliver an order of magnitude increase of capacity.

The program entered design phase this past month and as a result, we recently awarded two contracts to competing bidders for risk reduction and design development. We plan to launch the first TSAT in November 2011. Second, we are moving to more persistent surveillance with space-based radar and other innovative capabilities. Space based radar will provide a start on persistent global situational awareness and target tracking capability as part of a horizontally integrated, DOD wide and national system of systems.

Radar from space will provide day/night, all weather, worldwide multi-theater surveillance on demand. In FY '05 we plan to focus on concept definition, risk reduction and systems engineering activities, all leading to a system requirements review in the third quarter of FY '05 and system design review as early as FY '06. These activities are part of the study phase, which will culminate in a down select award and a decision to enter design phase in mid-FY '06.

As I look over our total National Security Space Program, there are areas that require our vigilant attention and we plan to work these areas hard in the coming months, placing emphasis on each of these areas in future budget deliberations. For some of our constellations, our replenishment strategy provides very little margin if there is a launch failure or a premature on orbit failure or a significant program delay.

TEETS:

While I am confident in the systems we are developing, true capability is the result of end-to-end performance in the support of the user. Greater emphasis is needed on synchronization of fielding ground and air receivers and terminals to match on orbit capabilities. The aggressive DOD and intelligence community horizontal integration effort to better integrate and exploit ground, air and space remote sensing capabilities remains a priority for us.

We have taken steps to strengthen the acquisition process for National Security Space Programs, but there is still much to do. We are committed to building credible management reserves into our acquisition programs so that program managers will have resources available to solve problems in a timely way. Mission success in all phases of space operations and acquisitions continues to be my highest priority. We made steady progress on space programs during the past year and the president's FY 2005 budget request, along with our efforts to enhance the space profession will enable us to continue that progress.

I very much appreciate the continued support the Congress and this committee have given to help deliver these vital capabilities and I look forward to working with you as we continue to develop, produce, launch and operate critical space systems that deliver vital capabilities to this great nation.

Mr. Chairman, this concludes my opening remarks and I look forward to your questions.

EVERETT:

Thank you, Mr. Secretary. At this point, before we proceed with questions, I'd ask everybody on the panel to join the secretary at the table. I remind members that we are on the five- minute rule, but we will be here as long as there are questions to be asked.

Mr. Secretary, I will get things started by pointing out that our space programs have been plagued by schedule, slipped in cost increases and I'd like to know what has been done to ensure that the future programs remain on schedule and within expected costs.

TEETS:

Yes, Mr. Chairman. We've had an aggressive activity ongoing to revamp and revitalize our space acquisition efforts. One of the early steps that came about as a result of the recommendations of the National Space Commission was to move our acquisition authority in the Air Force Space and Missile Center under the banner of Air Force Space Command.

And in addition to that as we looked over the total aggregate of space systems that we are in the process of acquiring, we put out a new national security space acquisition directive. It is a directive known as 0301. It's an acquisition process, really, that is tailored after practices used and developed over the years by the National Reconnaissance Office under something called Directive Seven.

And what it does is it tailors an acquisition process for our National Security Space Programs that recognize the important differences in acquiring space systems from

acquiring high production rate quantities of military equipment like, for example, airplanes or tanks or one thing or another.

And so what it does is cause us to be able to focus great attention on a program early on to make certain that the programs are structured properly, that they have the proper systems engineering trade studies done early on, that as we start to meet these requirements and go through the acquisition process, we have enough solid engineering work behind them.

I think this acquisition process called 0301 -- National Security Space Acquisition Process -- has been helpful to us in formulating both the space based radar program and the TSAT program that we spoke of early.

EVERETT:

And you've placed all of this in the capable hands of General Lord.

TEETS:

General Lord is in charge of Air Force Space Command, indeed.

EVERETT:

Congratulations, General. We'll be looking to you to deliver on all that the secretary said.

LORD:

Can I add a little bit to what Mr. Undersecretary said?

EVERETT:

Certainly, please.

LORD:

I think a couple of things we've got under command under his leadership as the undersecretary has certainly helped to pay off, one absolutely the transition of the acquisition armed to us in Air Force Space Command has really helped. He and I have a joint relationship with the folks in the acquisition chain.

What we've done at the headquarters, certainly, I think has helped and that is to make sure that our requirements process is stabilized so that we don't keep changing the requirements on the people that are building the hardware and we establish a what we call an urgent and compelling requirements review process where if you want to change the requirement that would interrupt the baseline of a program, you need to have a pretty urgent and compelling reason to do that, so that we don't have those wild gyrations in program baseline which create the difficulty.

We've done, I think, a good job of that with Mr. Teets support have been able to have the urgent compelling process help us. If you take a look at how we are doing requirements in the space based infrared program, SBIRS, for example, we have a set of like 10 evolving capabilities that would occur over a system. And we've held fairly constant to that and I think it has paid off in terms of program stability. So those are things that we can do working together within the community, working with our colleagues in the other services to make sure that we absolutely can state affirmatively what we want requirements-wise and be able to deliver on that and make sure that we can stabilize the programming.

EVERETT:

Well, I congratulate you on not adding to the baseline of the project. Apparently taking note of the Comanche aircraft over the years and the baseline has been added and added and added until we've had it canceled.

I didn't start the clock when I started, so I am going to yield my time, but I will have a second round.

REYES:

I just have a couple of areas that I want to explore. The first one is how long do we expect the SMTI function of SBR to perform and I want you to discuss not only what we expect it to do, but what mission SBR will not be able to perform. And I have a follow up dealing with the Iraq.

TEETS:

Yes, sir. Now, just to make certain that we are very much on the same wavelength, when you say SBR, it's space based radar. OK. Good. There's a sister program called SBIRS High and SBIRS Low, which is space based infrared High and Low. But your question is referring to space based radar.

REYES:

Space based radar, right.

TEETS:

We see space based radar as being a technology that is now mature enough for us to be able to field and deploy a system that can give us a start on persistent surveillance capability. This persistent surveillance will be in the form of both surface moving target indications, that is to say from space you can detect moving targets and display them to a user in the field and if on demand, you want to take a synthetic aperture radar image of that target, you can.

So since radar has the unique capability of being able to see through clouds, to be able to image or do surface moving target indications at night, you can start now to see the effects that you can achieve by having some persistence in your surveillance activities. That's the big driving factor behind the desire to feel the space based radar capability. It will tip and queue air assets that are already in place also doing surface moving target indications as well as synthetic aperture radar imaging, that is to say JSTAR (ph) aircraft sometimes have to operate in an environment where they can't see down into deep valleys or can't follow targets as they are moving. Space based radar will be able to tip and queue and similarly it will receive tips and queues from JSTAR (ph).

So we see this whole space based radar system unfolding in a way that will give us real networking capability and real capability to service all war fighters in the field.

REYES:

I was in Iraq a couple of weekends ago and I was wondering if space based radar were in operation today, how much help would it provide our troops, for instance, in areas like Baghdad, Fallujah, those urban areas. Would it be able to give us the kind of information that would protect them from possible attacks?

TEETS:

It would certainly assist. Now, space based radar is not at its best in an urban environment. However, when troops are on the move, as they certainly were during the initial days of this war fighting activity and fast on the move up to Baghdad, space based radar would be of invaluable assistance, because it would give you clear indications of enemy troop movements and locations of enemy troops in advance of your advancing forces.

And, as a matter of fact, during that initial phase of the war in Iraq, JSTARs (ph) and the capability that it gave through synthetic aperture imagery was able to look right through the sandstorms, identify positions of Iraqi tanks and mobile personnel carriers

and provided unquestionable assistance. Space based radar would give that same kind of assistance on a broader area.

REYES:

Thank you. I see my time is up.

EVERETT:

John?

SPRATT:

Thank you all for your testimony. I have been following for some time SBIRS High and SBIRS Low connected with missile defense and it's been a very elusive technology. I think it was about five or six years ago I was in California and the contractors for the SBIRS High program presented it to us. It looked ship shape and they were saying they might even begin launching ahead of schedule.

That was five years ago and I understand now that for SBIRS High the schedule for the first Geo (ph) launch is sometime in 2007 and that is a slip of five years from the original launch schedule.

On the cost side, SBIRS High, according to the first selected acquisition report was supposed to be \$3.6 billion for the system. I checked a 2003 (inaudible) and it is up \$7.85 billion, \$7.85 billion -- that's a 120 percent increase.

There are some outside critics who are looking at these programs, particularly the TSAT and saying that your technology is not yet mature enough to be moving as fast as you are. We are talking about the deployment. GAO, the General Accounting Office says that you don't have the knowledge to reliably establish cost scheduling and performance goals and they say that underlying the technology was simply too immature to establish those and you pushing it far too fast.

How do you respond to those critics and how do we avoid the cost experience, the performance experience and the schedule experience we have with SBIRS High?

TEETS:

Thank you, sir. Let me start by talking a little bit about the SBIRS High program that you referred to earlier. That facts and figures as you espouse them were, I think,

essentially were very accurate and it's not a program that has been executed with distinction up to this point in time.

In December of 2001, as a matter of fact, within two weeks of the time I was sworn in, the Air Force notified the undersecretary of defense for acquisition, technology and logistics, that a Nunn-McCurdy breach was indeed in effect or, I'll say, a Nunn-McCurdy breach was predicated for the SBIRS High program at that point in time.

Undersecretary Aldridge then notified Congress of a Nunn-McCurdy breach and we went through a very significant intensive review of where the SBIRS High program was and what the alternatives were for how to look at possibly terminating the program and picking up an alternative. We found the program was very ill structured. There were contract clauses in the contract that were not appropriate. Too much responsibility, very frankly, had been handed over to the contractor and the government was not providing necessary oversight to the program.

We looked at some alternatives that involved using some capabilities that had developed in the national reconnaissance office and we compared that to the possibility of restructuring the SBIRS High program. We came to the conclusion in the spring of 2002 then, that the SBIRS High program would be best served by being restructured with additional resources added to it. And you kind of quoted what those additional resources were that eventually got added to it.

Secretary Aldridge recertified the program as being the restructured alternative being far superior to trying to start over to provide this capability. Now I just want to pause and say the capability that SBIRS High provides is vitally important. It is the follow on system to our DSP or Defense Support Program.

TEETS:

It's the SBIRS High program that will give us continuing early warning of strategic missile attack and these are systems that must be available 24 hours a day, seven days a week all of the time to give us early knowledge of strategic missile launch.

SPRATT:

If I could interrupt you.

TEETS:

Yes, sir.

SPRATT:

That's the point. This is one of the most, if not the most important satellite project we're launching.

TEETS:

Yes, sir.

SPRATT:

Critically important and also pretty complex as evidenced by the schedule slippage and the performance problems you would have to go back and rearrange. Given that, how can we be assured that you aren't moving too fast here and committing the same mistakes you committed with SBIRS High?

TEETS:

When we restructured the program, we added a significant amount of test content. We reviewed with independent people, we reviewed -- relook at a cost estimate, an independent cost estimate. We looked at the content of the test program and essentially restructured the program in a very meaningful way.

Now I want to hasten to tell you that we've made a lot of progress in the last two years on the SBIRS High program, but we are facing some adversity today.

SPRATT:

Are you going to be able to launch by 2007?

TEETS:

Yes, sir, we will be able to launch our first two highly elliptical orbit sensors before that. But I do want to say that we're facing some adversity. The problem that we've encountered since we have restructured the program is that these two highly elliptical orbit sensors ride on a host satellite that has very tight magnetic electromagnetic interference specifications imposed upon it.

And we have faced some adversity in the fact that this sensor, which has a scanning mode, does emanate some electromagnetic interference that is harmful to the host

satellite. As a result, we've had to do some redesign activity and it has slowed us down some. But we are making excellent progress. I review the SBIRS High program quarterly with the presidents at Northrop Grumman and Lockheed Martin. I also have monthly reviews with commander of space and missile center, General Brian Arnold (ph). As a matter of fact, on Friday of this week, we'll have a president's review of this program.

We have enormous focused attention on this program, and while it is still technologically challenging, I'm confident that we're on solid course and that we will be able to deliver a SBIRS program that can indeed pick up when DSP starts to fade.

EVERETT:

The gentleman's time has expired. We'll come back for a second round. Let's see. Mr. Turner?

TURNER:

Thank you, Mr. Chairman. In looking at your testimony concerning partnership with NASA, I am particularly interested with the effort with the president's commission on implementation of United States based exploration policy. They have scheduled their second hearing, the commission has at Wright-Patterson Air Force Base in my district and certainly with Wright-Patterson Air Force Base is the leading edge in representation in technology in advancing scientists. The coordination of the Air Force and other research labs and NASA is very interesting to me.

You reflected in your testimony, I think it was DARPA, the Air Force research labs, the Navy research labs and NASA are working in partnership with (inaudible) exploration as to how this technology might be helpful as you look to other systems. Could you please elaborate on that? You also reference a partnership council and its role in working with the president's council

TEETS:

Yes, sir. I'd be pleased to comment and then I'd ask General Lord, who also serves on this same partnership council perhaps to add some thoughts of his own if he would.

Several years ago we formed a partnership council that was made of myself, General Lord, Sean O'Keefe, the NASA administrator, Ron Sega (ph) who is the DDR&E person in the Department of Defense and Admiral Ellis, commander of the United States strategic command. This partnership council meets quarterly and we talk about how in the national security space world how we can cooperate between NASA, Air Force, Navy, Army, Stratcom, military services, and frankly, the intelligence community. I'm on this partnership council -- one of the reasons I'm on it is because I am director of the

national reconnaissance office, so we bring that same kind of a capability and focus to this partnership council.

What we have focused our efforts on is mutual technology development that can -- that we can all benefit from. NASA has some very unique challenges in front of it that are associated with manned space flight. Those of us in military and intelligence community, national security space really don't have manned space flight requirements per se, so there are some differences, of course, but where it comes together is in the technology development arena and we share the technology that is going on in DOD and the intelligence community along with what is going on with NASA and partner in that way. General Lord, I would ask you for a comment.

LORD:

Yes, sir. Thank you, sir, for the question. We've been meeting periodically since, I believe, 1997 with NASA on a quarterly basis in Air Force Space Command. My predecessors as commanders have met with previous administrators prior to Administrator O'Keefe and just as Mr. O'Keefe said, talk about mutual areas, the previous administration said that in the rocket business that NASA would work with useful technologies, Air Force would work with expendable technologies as a principle interest, but we do have a healthy cross interest in each others capability so we've been working those very hard. In a matter of fact, I testified a couple of times to our partnership and development of these programs.

Major General Nielson (ph), the commander of Air Force Research Lab, myself and Dill Martin (ph) at Material Commander and Right Pat (ph), we meet quarterly as well to talk about an emprise approach to this and working hard and comparing and working technologies. All the Air Force astronauts in Houston, 25 of them are signed up for space command so we have a healthy interest in bringing back Air Force astronauts after they have been in that program to bring that rich experience of operating and meeting in space back to the command.

As a matter of fact, our Colonel Susan Helms (ph) is the director of space control, six months in International Space Station, so she brought back to our command a wealth of information, so not only at the technology level but at the person to person level experience operating and meeting in space, helping interaction. We're involved in return to flight criteria for the re-fly of the shuttle and we've been actively involved in helping NASA and helping the administrator think through that and also our future break through as we talk about what we need to do in lower cost excess of space. We've looked interested in how we can do that. Mr. Teets and the administrator have asked us to continue to work that very hard, a healthy interest in continuing to work together.

TURNER:

I appreciate in looking at the president's commission today to go forward. I know that many of the decisions or recommendations might have impact on things that you are undertaking so it is certainly encouraging that you are working in concert so that all those interests are (inaudible).

EVERETT:

Mr. Franks?

FRANKS:

Mr. Secretary, thank you for coming, all you gentleman. I appreciate what I call the guardians of freedom. You not only guard the freedom of the United States, but really in a sense the whole of humanity and we are so grateful to you. Having said that, I know that this SBIRS program is probably one of our first line defenses as far as maintaining contact with what is happening on the ground as far as early warning and I'm wondering what its capacity is to coordinate a response with a future strategic missile defense with any sort of response to what we might see on the ground.

TEETS:

Yes, sir. The SBIRS High program as a follow on to the Defense Support Program will provide very, very strong capability to tip off or queue missile defense agency with literal state vectors that are coming up from the launch of a strategic missile. So it's very definitely in queuing mode and SBIRS High will provide significantly improved capability over what can be done with today's system called DSP. We will give warning earlier and we will give a much more complete map of the trajectory of the missile in question is taking.

FRANKS:

And as I understand, Mr. Secretary, that would be just the kind of that road map in the sky. It wouldn't be an actual coordinating device that would coordination the missile from the ground to the target, is that correct?

TEETS:

That's correct. It would give -- it would send information to the missile defense agency of what the target is doing and where the target is heading. Missile defense agency would then use that information in order to take it out.

FRANKS:

Well, I don't want to ask any question that would be in the classified area, but I'm sure that as you build these systems, as you plan for them, one of the first considerations is where a likely attack might occur. It's been said that we're not always worried about a country that has several nuclear warheads; we're worried about one idiot that has one. And are you able to enlighten us all to what you think might be given just the difficulties such insight what might be the first area of concern, the first consideration as far as early capability?

TEETS:

Yes, sir. I can. Recognize now that both Defense Support Program, DPS, and SBIRS High are passage sensors that are simply monitoring the launch of ballistic missiles and that monitoring capability is essentially on a global basis. You look at the satellites that are in geostationary orbits coupled with those that are in a highly elliptical orbit; you get essentially global coverage of missile alert.

Now, the missile defense agency, led by Lieutenant General Ron Kadish is in the process now of putting together an initial defense capability that is scheduled to come online yet this calendar year with a first kind of a capability. I think the details of that are somewhat classified and I think, frankly, that General Kadish would be the proper person to give you the details behind that.

FRANKS:

So if I heard you right, Mr. Secretary, you are saying that the system is so much global in nature that it's not necessary that you should look for a specific area that you have.

TEETS:

We'll have global coverage of knowledge of a launch against us. It will take a considerable length of time before the missile defense agency is in a position to be able to take out a target emanating from virtually anyplace on the surface of the earth.

FRANKS:

But I meant to understand that any missile capable of reaching high enough trajectory to reach the United States in most areas would give off a distinctive enough signature that there would be no doubt of its nature, is that correct.

TEETS:

That's correct. Of course, the more intercontinental it is, the more time that you have to deal with the threat.

FRANKS:

I just want to repeat my earlier remarks about how grateful we are to all of you. Thank you.

EVERETT:

My colleague Congresswoman Tauscher?

TAUSCHER:

(OFF MIKE) Thank you, Mr. Chairman. Thank you for being here, gentlemen. Undersecretary Teets, I agree with many of the objectives that you laid out in your testimony, especially assured launch and effective space programs that will aid war fighters. But I am a little concerned about your discussion about offensive counter space.

In your testimony you say that we will pursue (inaudible) capability to limit any adversaries' ability to deny us (inaudible) to space and deny any adversary's use of space especially for hostile purposes. Them's fighting words.

The Air Force transformation plans has made public this month a description of a number of near, mid or long term weapons or offensive platforms such as the air launch to heavy satellite missile and the ground based laser. This (inaudible) can you kind of bring us up to date on what kind of threat or enemy we are posturing against and why do you believe this should be such a priority because of our policy on the so called weapons initiative state. Are you not concerned that the two weapons I mentioned would spray debris and threaten both our allies and our own space access?

And since our military is growing more and more dependent on space, do we not have the most interest in reducing the prospect of any arms race in space?

TEETS:

Thank you. I believe it is safe to say that we've already seen the opening of hostile activities relative to space capabilities. In Iraq, as you undoubtedly know, the Iraqis tried to deny us the use of our global positioning satellite navigation system capability to

deliver precision guided munitions and fortunately in this case we were able to overcome their attempts to deny us the capability and we maintained our capability to deliver precision guided munitions.

But I think it is also clear that our adversaries around the world have taken note of the fact that we do derive a great asymmetric advantage from the use of space assets.

TEETS:

And so it is natural for us at this point in time to recognize that we need to be working on and studying technologies and systems and capabilities that will allow us to defend ourselves against potential threats and at the same time allow us, if our forces are being targeted by an enemy's space capabilities, we need to have capability to deny them the use of their space assets.

And so it is in that context that we are looking at a wide variety, a wide range of potential capabilities and systems to provide, first of all, knowledge about what is up there in space. There are some 10,000 objects in space and while we catalogue those in terms of orbital characteristics, we know precious little about many of them and we'd like to know more. So we want a better situational awareness picture.

We also then want to start to focus strong attention to defensive counterspace and ultimately we need to think about how we would deny an adversary their use of being able to target our troops and that's what we call offensive counterspace. Now there are a lot of different ideas that are being studied and all of them would be consistent with our current space policy applications. Some of them, as you say, offer downside risk in the sense that they could create debris in orbit. As a result, our primary focus and what we look at first is how could we deny them the use on a temporary basis without causing permanent damage.

But for example, if a foreign commercial imagery satellite were being used to target our troops, what would we do to eliminate that capability but have it be a reversible effect, that is to say, temporarily deny the use. That's the way we're heading. It is true that in our Air Force research laboratory and in other laboratories, people familiar with the technology have different ideas and put forth different concepts and I guess I would ask General Lord to comment as well, because General Lord is commander of Air Force Space Command, in fact, has the Air Force space control mission assigned to him.

LORD:

Yes, ma'am. I appreciate the question and I think Mr. Teets is quite right. Three areas of this mission of what we call space control, this situation awareness, understanding what's in your environment (inaudible) what we have to do more of and work well on so that we can be able to discriminate in the environment of space -- is this somebody trying

to do something against us or is this an atmospheric effect, a solar flare, some kind of phenomena that we need to be able to discriminate.

So we need to understand the environment of space and who is up there and who is operating and the second piece of them taking some kind of defensive measure to make sure that not only do we work the satellite piece of this but the ground stations, the links between and make sure we have all of those covered, which is an important part of that and the last piece is the offensive counterspace piece and those are kind of in our priority orders -- space situation awareness, defensive counterspace and operation for offensive counterspace to do the things we need to do to deny somebody trying to use that to advantage in reversible kinds of ways.

And we'll introduce some of our first countercom capability this year, in '04 and then later on in '07 and '08, the counterintelligence surveillance and reconnaissance capability that is a reversible kind of effect that generates an effect on an opponent system for a temporary basis and then resets after the threat is over with. That's something we want to take a look at.

I think the whole mission really speaks to the fact that just as you mentioned that we were highly dependent upon both militarily and economically it's important for us to maintain that advantage and I think the real key to doing this mission successfully is working hard on a space situation (inaudible) and taking those in that (inaudible) sequence and learning as much as we can about the environment, putting that all together and taking the right kind of steps to be defensive in nature. I think that is something we can all participate in both commercial, military and civil systems. It's important for everybody to work at together.

TAUSCHER:

Thank you, Mr. Chairman.

EVERETT:

Congresswoman Wilson?

Before you start, at the request of the ranking member, we are going to have a closed hearing on the very subject that you want to talk about.

(UNKNOWN)

Good. Mr. Chairman, let me just say, I really appreciate your comments. I thought they were very thoughtful comments. I know that we have some barriers to discuss for

classified reasons, but I really appreciate your effort today as open as you could be (inaudible) opportunities. I appreciate that you have that in the forefront. Thank you.

EVERETT:

Ms. Wilson?

WILSON:

Thank you, Mr. Chairman. I wanted to thank you all for coming, but also to apologize for coming late. You know how things get double and tripled scheduled up here. But I appreciate the written testimony, which is very helpful to me. What I wanted to ask you and I'm not sure who is the best person to answer this, but it has to do with new acquisition policies and whether we are at the point where team (ph) discussions about spiraling acquisition and spinning things on and going to 2.0 and 3.0 as to versions of particular systems.

I guess I'd like to comment on the laws and procedures relating to this process and where we are and where we need to be yet with acquisition, particularly what are your thoughts on how we need to modify acquisition policy to make this work, to make sure we get the assurance that you're on schedule and you're on budget and it's doing what it is supposed to do, but also that we get things into the field or up into space and available to the war fighter in a rapid way. It's something of an open question, but.

TEETS:

I'd be happy to take a first cut at it. I think that one of the first things we recognized here over two years ago is that many of our space programs were from an acquisition point of view were in serious trouble and required additional resources to be able to restructure the programs and get them back on track. We tried to take a hard look at is there an acquisition process improvement that is required and we came to the conclusion that yes, there was and as a result, that's when we went to work pretty hard on the subject of this national security space acquisition space directive labeled 0301.

This directive tries to take into account the unique characteristics and difficulties associated with acquiring space systems. The fact that you are dealing now with a case of one strike and you are out. If you are on the launch pad and you have a vehicle that is about to try to deliver a satellite into orbit and you have a failure in that, it's all over. You don't get a second attempt at it. And so, one of the things we tried to do in building this new acquisition policy was to give recognition to the fact that mission success is the primary focus that you want to structure the program around and that you want to have a strong systems engineering effort early on that creates a very robust test program to fully test all of these systems before they are put into service.

I think we've made good headway in that and I don't want to say our acquisition policy document is perfect. As a matter of fact, I think we've learned some lessons since first implementing it and I look forward this year to being able to make some modifications to our acquisition policy 0301, which will further tune it and tailor it to the specific needs of these space systems that we are developing.

The other thing that we are trying hard to work on but it's not easy to do frankly, it's going to take some time to get it done, but I was aghast, to be candid with you, when I first came into this job and found that we had program managers trying to manage these very difficult technologically complex programs with no program management reserve. It can't be done. A program like SBIRS High, a program like future imaging architecture, programs that are pushing the leading edge of technology cannot be successfully executed without having the program manager having discretionary resources to be able to apply the problems that inevitably will occur.

So we've instituted as part of this acquisition policy that I've mentioned or acquisition procedure or directive that we've implemented a requirement for independent cost analysis, a requirement at every defense space acquisition board meeting that we have, my first question to the program director is what is the state of your program management reserve, how much discretionary resource do you have at your disposal so when a problem arises in the contractor's test program or you find that you need to redesign in this or you have a bad part or a plague in the system, what kind of discretionary resource do you have to apply to this problem.

And we have some guidelines, depending on how hard we're pushing technology, as to how much that reserve should be. So we try very hard to implement and improve technique. I will say it's a daunting challenge and the fact that we are here today talking to you about an '05 budget while we are actually executing '04 and at the same time we're starting to worry about preparing the '06 budget makes it a real tough challenge. But I think we're making headway.

EVERETT:

Mr. Thornberry?

THORNBERRY:

Thank you, Mr. Chairman. I also apologize for being late. I've been chairing a homeland security subcommittee meeting during this time. Ms. Wilson raised the point that I was most interested in, because we are so dependent and will be ever more so on space because of great opportunities, and yet, just about every space program is behind and over budget and handicapping in some ways our ability to be as successful as we want. Let me follow up with this.

Do you think, Mr. Secretary, that we do not have the expertise maybe, that we should have about space and some of the unique challenges it presents. Is viewing space primarily as a means of accomplishing other things, does that make it more difficult for us to be successful in executing these programs and part two, some people may argue that until space has its own service, that it will not have the career path or the emphasis that are needed in order to make sure that we are successful not just at building stuff, but in having a full scope space policy. Do you think there is any legitimacy to those criticisms?

TEETS:

Well, certainly there is legitimacy and those are very real factors that you point out. I am a strong believer that we do have the expertise and the knowledge to be able to successfully execute space programs. There's a very daunting challenge and as you look ahead to the development of a high technology space program, generally speaking you find a wide range of possibilities for cost outcomes.

If you look at the program optimistically, you'll get a number that is quite significantly different than if you look at a program pessimistically. And since we are always trying to maximize the amount of capability that we have, we do ourselves a disservice to become too pessimistic. Similarly, if we get too optimistic, we are going to run into cost and schedule problems. So it is a tough challenge to pick the right road to program resources for space systems.

Now, a person that has been involved in that for some 15 years at the national reconnaissance office is Admiral Rand Fisher. If I may, would like to ask him if he'd like to make a comment or two on this subject of do we have the capability to acquire systems on cost and on schedule. I know that General Lord, really, has strong feelings about developing the professional cadre and talent to do it.

THORNBERRY:

Let me just add -- if you know of other things we need to do in the law as far as acquisitions or other things, include that in your answer.

FISHER:

Yes, sir. And that you, Mr. Teets and thank you, gentlemen. In the 15 years that I have been working in the NRO and working in acquisitions, I've seen both programs succeeded and those that have had problems. And when I look at the difference -- the programs that succeed and these are things we've talked about a little bit today are those that understand the requirements and have some requirements bounding process. There are those that have been well engineered from a systems perspective and there are those where there have been excellent risk identification and risk management and by that I

mean if you identify a technology that is problematic, then where are the opportunities in time and in technology space to give off that and make a decision to preserve some matter of performance and schedule and cost.

So it's those kinds of decision processes that I think characterize successful programs. And Mr. Teets' comments about 0301 and Directive Seven and his personal efforts in terms of these acquisition boards have reinforced that across the national security space domain. So what we are seeing is better rigor in terms of bounding the requirements -- better rigor in terms of the engineering and risk management as well as the cost. I would add one other thing that I would note. In the 15 years that I've been involved in the space community, I think we are seeing a deterioration in the industrial base at the vendor level in terms of the numbers and diversity of folks that build our parts.

And so that becomes problematic when you are building complex spacecraft when you find out about a parts issue late in the build you have a problem. And that's something that we're also addressing in the community as well.

EVERETT:

All right. I'm going to hold the rest of my questions until all members have had a chance to ask any additional questions that they want to. Mr. Reyes?

REYES:

Thank you, Mr. Chairman. Since we have deployed the first strike group in Iraq and you answered my previous questions in terms of the kind of information that would be available either real time or near real time, my question is, how much information do we expect space based radar to generate and how will this information be sent to potential users and in fact, what capability do we have to disseminate the information in a useful format and yet in a timely manner to be able to be used by, for instance by our striker battalions in that kind of environment.

TEETS:

Sir, the answer to that question is that it is currently very much under study in the sense that we have two contractors now that are competing for the study phase contract activity and what we've asked them to do in their proposals is to address that very question of what are the alternatives, how would we get the information down, how would we best post it to the global information grid, how could we allow people in striker brigades to be able to pull information off the global information grid and so forth.

So what I am trying to suggest to you is that this is still a work in process, but conceptually, there is enormously important information of military value that we are

determined to assure our people in the field will get. It could be, for example, a space based radar system operating in conjunction with this transformational communications system, that is massive data that is being collected by this space based radar would get pumped down by laser comm enormously high bandwidth transmission down into a ground station in CONUS, let's say, and massaged, worked on with a lot of computational capability and I'm talking about seconds of turnaround time, but then sent back up to a TSAT communications satellite, which would receive that information again in very, very high data rates, but then be able to transmit right down to Iraq through a sand storm or a dust storm or a rain storm with S-band kind of capability to a soldier in a jeep. He could pull the information he needs from it.

Now that's one concept. Another concept that we are dealing with and frankly, General Dodgen and the Army people have been real strong in their statements that we'd like to have some direct downlink into the theater. We want some onboard processing onboard this space based radar and we want to do some synthetic aperture radar imaging, for example and have that image direct downlinked from the satellite to the jeep. We're looking at all of those kinds of concepts and I might just pause and ask General Dodgen if he'd like to comment.

DODGEN:

Thank you for your question, Congressman. You probably more than anybody understand exactly the needs of the Army in the future in this regard. Our whole tactics, particularly not only for the striker brigade, but for the unit of action that is coming after it, the pin on having this type of persistent intelligence at the fingertip of the soldiers and actually showing up in the vehicle (inaudible). That's why we are participating in so strongly in the requirements process to ensure that these things marry up.

I think the Y-band communications and the space based radar capabilities are vital to the way we're going to fight in the future.

REYES:

And I assume a critical part of this is to make sure that they aren't any delays in TSAT, because that is such a critical component of our ability to use space based radar information.

TEETS:

Sure.

REYES:

Thank you, Mr. Chairman.

EVERETT:

Mr. Spratt?

SPRATT:

Would this be a LEO or a MEO?

TEETS:

That is still under trade studies right now. We've asked our contractors to give us concepts. What we are trying to say is that we want to introduce persistent surveillance. Now there a couple of ways that you can do that. The radar job is easier from low Earth orbit than it is from a medium Earth orbit, but if you go into low Earth orbit you are going to need more satellites.

On the other hand, if you go into a higher orbit, while it makes it a much more difficult job to collect the information, you need fewer satellites once you do it. So we are asking our contractors to give us state of technology and this is still a dynamic situation. We are casting a broad net here. We want the best possible persistent surveillance start we can get. Space based radar is the way to do it, because we know it's all weather, day/night kind of system where you can actually achieve persistent collection. Which orbits and how many satellites is under study now, sir.

SPRATT:

If you went to a LEO, would you be vulnerable to (inaudible). Can ASAT (ph) take out the direct launch from a country that had three stage missiles?

TEETS:

Yes. Vulnerability in low Earth orbit is certainly higher than it would be in a higher energy kind of an orbit. But I think one of the things that perhaps we should defer to our closed session, but I'll just say is we have done a very serious vulnerability study associated with all of our national security space programs and it's not just the airborne assets or the space borne assets, it's also involves ground stations, it involves links that are particularly vulnerable and we're trying to shore up our vulnerabilities in a very real case because we do see, frankly, a threat starting to evolved.

SPRATT:

I understand the constellation you are looking at it would have non-satellites as opposed to 21 small version in low Earth orbit configuration and the cost of that is \$34 billion in 2004 constant dollars.

TEETS:

It's true that the reference constellation is a 9 VOL-EO (ph) constellation and the \$34 billion we have is a projected cost estimate out through, I believe, is 2026. And so we are talking about a real long life cycle of this constellation with replenishment, et cetera, over the next 22 years.

SPRATT:

Well, that's not just acquisition costs. That is acquiring, maintaining and operating it through 2026.

TEETS:

Yes.

SPRATT:

If you go to '21, does the cost go up on a linear basis or is there some savings that you enlarge the system?

TEETS:

As you enlarge the system, there clearly are savings and I'll just say that as it relates to the life cycle cost, I do think there is a lot of variation yet in the system architecture. As I say, we have not locked onto a nine ball system or a 21 ball system or LEO orbits or MEO orbits. We're really exploring a wide range of possibilities here, but for purposes of laying out the five year defense plan, we did assume a nine ball LEO constellation, that's true.

SPRATT:

But it's a pretty fundamental decision which affected cost and performance and how many you launch whether you go to LEO or MEO, is it not.

TEETS:

Well, that is what we're going to ascertain here over the course of the next six months.

SPRATT:

Now I can only imagine that this single satellite must acquire huge quantities -- copious quantities of data.

TEETS:

Yes, sir.

SPRATT:

And you want it to do sort of on station processing, which I can readily appreciate why. But that's a tall order, isn't it. Isn't this a huge software challenge, among other things?

TEETS:

It's not so much a software challenge as it is a communications system challenge in my estimation. It's terribly important that we bring online this space based radar system in the same time window that we are bringing online this transformational communications architecture.

SPRATT:

TSAT is integrally linked with this and if there is a slippage in the TSAT or if it doesn't achieve it's own capacity specs, then you've got a problem with this system, too.

TEETS:

Yes, some problem. I would say this. When I said transformational comm architecture, TSAT is one very important part of the transformational comm architecture, but the

beauty of our transformational comm architecture is that it is a network system of systems that can degrade slowly.

If TSAT comes on line late, we're not going to be without communications capability. We have other nodes and other capabilities that can continue to supply us if we are a little bit late with TSAT.

So there is no one communications system that is going to take down our national security space communications capability.

SPRATT:

For full capacity you need TSAT.

TEETS:

For full capacity you need TSAT. There is no question about it. TSAT is a vitally important link. I am just trying to make the point that it doesn't eliminate our capability if its late.

SPRATT:

A minute ago you mentioned the downlink, the ability to connect even with the tactical commander in the field.

TEETS:

Yes, sir.

SPRATT:

That was also a characteristic that was held out for the SBIRS Low battlefield characterization which would have included some accessibility, some interlink between the satellite and the commander in the field, but it would never (inaudible). And I think it's been dropped with respect to DSP. It may be a feature, it certainly is a desirable feature for the new generation for SBIRS Low but we tried it for a long time now and we've not attained it. We haven't not proven that it can actually be done at that level of tactical capability. Usually it's going through a Cheyenne Mountain type of facility and being relayed out to the field. How confident are you this can be achieved in this system.

TEETS:

I think that is one of the key trades that needs to be done and we're asking our contractors to again give us trade space there. Do we want to do centralized processing at a ground station using transformational comm links or do we want to do onboard processing and how much onboard processing do we want to do.

Again, I think there are trades that are available to us on both space based radar and transformational comm that can lead us to an optimal answer.

EVERETT:

Will the gentleman hold his questions for the next round?

SPRATT:

Sure. Certainly.

EVERETT:

Ms. Sanchez?

SANCHEZ:

Thank you, Mr. Chairman. I find this transformation comm discussion fascinating. Can you just talk a little bit about the opportunity we have or exercising our partnerships in some of our other alliances, for example, our NATO alliance with the British and others who are obviously very close to us at the same time we have competitive satellites and private sector concerns.

And the issues of sec (ph) transfer, export control, these are inextricably intertwined and they are tough policy decisions that we have to make in different venues, but they all come to the forefront when we are trying to figure out how to protect our (inaudible) maintain proprietary (inaudible) some of them have redundancies (inaudible) inoperable with allies, for example, in our situation where we have perhaps a NATO exercise and we have many people that we have to communicate with. Can you talk about what you think about that.

TEETS:

Yes, ma'am. I'd be pleased to. First off, let me say that with regard to our transformational communications architecture, we are designing it and we are thinking about it across our national security space domain and that national security space domain includes, of course, all the military services, it includes the intelligence community of the United States. It also has some participation with NASA.

We don't have foreign involvement in designing this architecture. This is a U.S. only architecture at its core. By the very nature of what I am saying now, I think that you'll realize that one of the challenges we have is going to be multi-level security. There will be users on this system which will be able to use the transformational comm system and pull information off the global information grid that is based upon their level of security clearance that is involved here.

So that is pretty much the way we've handled it. We are saying that this system is going to use encrypted data. And the end points will unencrypt and we will use them just as we do today means to share information with allies or not. It will be at our discretion at the end point as to whether or not a certain person has a clearance to receive this kind of information.

SANCHEZ:

So the key system is at the operational level could or could not include an alley in the joint -- I think what you've done is you've taken all the walls down from jointness, but what you're saying basically is that it will be the ultimate barrier of entry at some level decided by us as to whether we share keys, as so what level we share the -- as to what level the information is filtered down to a place where it either is of a significant nature, classified or declassified or it stays right here.

TEETS:

Yes, ma'am. It turns out that we're fortunate today to really have the architect, the transformational comm architecture sitting here. Admiral Fisher, how about addressing this. Offer a comment or two.

FISHER:

Well, you've described it well, sir. I would offer that part of our team includes Mr. Stenbit in his role as ASDCCCI. Also just as heavily involved in both those organizations, I think, perform exactly what you are indicating, which is a liaison to the allies. I have briefed some of our closer allies on the emergence of this so that they understand where we are going. I actually think the attributes the architecture has which are to be able to carry multi- levels of security in the same encrypted stream and the

Internet protocol are going to offer far better opportunities to interoperate at the coalition level than we have today.

So I think it gives us that kind of policy level control, if you will, but also gives us the ability to share in a much easier way if we decide we want to do that.

SANCHEZ:

This is vitally important, because the widening yawn that we have, even with our own NATO allies where we are as large as the next 20 of our competitors in defense appropriations and authorizations means that at some level if we ever go beyond joint in the United States we could actually have a coalition that could be capable, we would have to really measure the success by having such significant operations. The gap between us is widening every day and comm is what is going to make or break us, I think and where the rubber meets the road and if we can save ourselves the opportunity of having the ability to have the keys work when we want them to, but at the same time filter the information down so at least we can have operational abilities, then I think we're going to be able to have a (inaudible) in the future that actually works for us. That's great news.

EVERETT:

Ms. Wilson?

WILSON:

Thank you, Mr. Chairman. General Lord, I wanted to ask you if I could, have you set up a task force to look at lessons learned from Afghanistan and Iraq on how to connect space to the war fighter and could you give us what the status of that is and what would be some of your initial conclusions are.

LORD:

Yes, ma'am. We followed Operation Enduring Freedom very aggressively with what happened in space. As a matter of fact, I had a chance to visit with our folks in Afghanistan. I had also been into Saudi Arabia and the United Arab Emirates and looked at our people forward deployed and what they are integrated. Both are OEF and also Operation Iraqi Freedom and very aggressively followed that. As a matter of fact, during the height of OIF we had almost 1,000 -- well, 1,200 people out at Air Force base command deployed almost 500 to 700 over in the theater of operations integrated with what is going on in our Air Operations Center with the people in the field to make sure as well as with the Army, Navy and Marines colleagues having people just like that involved in the aspects. We followed that up very closely.

The things that we really were most proud of was the service we provided in the global positioning system with an enhanced security, enhanced capability to have the constellation most accurate information on board those navigational satellites when they came in view of the theater, the missile warning piece that we were able to provide information to the theater of communications and support for all those activities.

People in the near operations center working for then Lieutenant General Buzz Mosley (ph) coordinating we synchronize our operations from back in Brandenburg (ph) up to real time working in support of those operations. We are very proud of those. So we follow all of those up and they are part of the joint lessons learned as well as what we've done independently in the Air Force and the integration of space. We've learned a lot from Operation Enduring Freedom just to help us in Operation Iraqi Freedom. We built those relationships and we pushed people to every exercise, visited every theater and we have space people involved in the day to day planning and activities and all the combatant commands.

WILSON:

What are the one or two things that you saw that you that you knew we could do better or that are gaps that you want to fix?

LORD:

I think that we just need to get more people involved from my end personnel wise and get more people familiar with being inside that (inaudible) of a combatant commander working a particular problem, because we do activities as the other service colleagues do to support worldwide capabilities as well as being able to tailor our capabilities for a specific theater and operation like we did for General Franks like we are doing for General Abizaid. So the more people we have involved in that, the better off it is for us and for them to be forward.

There is a healthy appreciation for the contribution of space to the actual achievement (inaudible).

WILSON:

If there is a report on that or your hot wash or whatever you do, I would appreciate seeing that. I want to see where you're going and what you've learned.

LORD:

I know Admiral Giambastiani from Joint Forces Command is involved in the joint lessons learned process and I believe that is just about all tied up and ready to be presented to the secretary of defense, to Congress.

WILSON:

Thank you, Mr. Chairman.

EVERETT:

Mr. Thornberry, do you have some quick questions.

THORNBERRY:

Thank you, Mr. Chairman. General Lord, Admiral Zubrowsky (ph) in the Office of Force Transformation has been doing some work on small satellites put up fast and cheap. Tell me what your opinion of what that is, where that program is and what I am particularly interested in, if you think it has merit, is the Air Force going to take it up?

LORD:

Well, the TacSat-1 you are referring to that Admiral Zubrowsky (ph) and the folks in OSD are trying to help lead with the partnership with DARPA and the folks in the Air Force research lab there's a TacSat-2 and others following on and we want to get involved and we've been involved in the early planning. There's going to be some really, I think, really important breakthroughs here in smaller technologies and some things that we will be able to do in the first satellite. It is supposed to be launched in May, by the way, by a new vendor in the launch business by Mr. Elan Musk (ph), who is an entrepreneur has developed a pretty interesting rocket. I visited his factory in Los Angeles and I think he has got a (inaudible) concept so lower cost access plus a smaller satellite capability so we're interested and want to follow that up eventually.

Mr. Teets in his leadership role has pushed us really hard to make sure we follow that closely and get involved and we've been in contact with them, Ellis (ph) in STRATCOM, he's interested, yes, sir, we're (inaudible).

THORNBERRY:

I just don't want it to get lost in the problems that we were talking about a little bit earlier with Secretary Teets. Let me just ask one final brief question. We don't have time to get into the whole career path that we were alluding to awhile ago, but on the scale of

one to 10 compared to where we ought to be, where are we in having career paths in the military that focus on space and develop the kind of expertise that we have to have going forward.

LORD:

I'd say right now 8.75, it could be 10 by a year from now. I am really -- you and I know, we've talked about this before and I've spent the last two years working this under the guidance of Mr. Teets and the space cadre development is something that we've taken very seriously and I am really pleased with how much we've seen improvement and I'm pleased with -- very quickly what we've identified in the Air Force along with our Army, Navy and Marine Corps colleagues is the cadre of people that we want to characterize in the space business and the first thing I wanted to do is measure their skills in the (inaudible) so I could have a good kind of way to measure ourselves against the path that we want to lay out.

We've got 1,600 of those folks identified and characterized in terms of our skills and abilities. By the first of July this year we should have about 7,000 of them. Hopefully by the end of the year we'll have all 10,000 in the Air Force plus (inaudible) the folks in the Army and the Navy and the Marine Corps so we can help (inaudible) their experiences and then from that we'll be able to measure our success in building the skills and abilities. We've got a set of courses now that we're putting on board. We've linked it with our other force development, so everything that you and I have talked about over the last three or four couple of years we are instituting, following up on the recommendations of the space commission. You heard Mr. Teets say here, his number one priority is mission assurance, mission assurance all the way, mission assurance every day, people always in terms of the cadre.

EVERETT:

I intend to end the hearing. I've talked to Mr. Spratt and he also has additional questions and my additional questions I will submit for the record. General Lord, I would ask for you to make sure that you tell us how you propose to improve space education not only for those directly involved in it, but also for those in other military branches of service who might be consumers of it and while you are increasing your focus on space superiority, and for each of the service representatives, if you could give us a statement on what you need from space, how you use it and what you expect from it.

Mr. Spratt? Sure.

SPRATT:

Look, I understand the importance of what you are doing. I am concerned by the experience of SBIRS High and by the rapid rate that this program ramps up to \$10 billion moving from concept definition to design phase in the next five years. That's a pretty big ramp up. That's a lot of money. One suggestion and one thing I would like to submit for the record, what are the pressure forms? If you put your contract management people out in the various production facilities, what critical points are you going to be looking at so that you know that this thing is not working right, it is not developing as intended, costs are turning upward. Could you give us that off the back of an envelope and submit it for the record also, what you would look for here that would be either SBR or TSAT.

TEETS:

Yes, we will definitely submit it to you for the record. I'll just say real quickly that on - particularly on transformational comm we have a very aggressive technology maturation plan in front of us. There are several technologies that are at technology readiness level number three at the moment which we need to mature to technology readiness level number six before we actually down select to a single contractor and that will be in FY '06. So we do want to retire technology risk early and we have, I'll say, an important plan for how we're going to measure incremental success as we go through this whole process and we'll be happy to provide that to you.

EVERETT:

I think we've only got about eight minutes left. In addition, General Lord, would you please give us some comments on the EELV, provide us essential to any access, we can't get up there, we can't do anything and if what steps have been taken to ensure that we have what we need to get up there.

The meeting is adjourned. Thank you very much, gentlemen.

WITNESSES:

PETER TEETS, UNDERSECRETARY, UNITED STATES AIR FORCE