

HEARING TO RECEIVE TESTIMONY ON MILITARY SPACE PROGRAMS IN REVIEW OF THE DEFENSE AUTHORIZATION REQUEST FOR FISCAL YEAR 2009 AND THE FUTURE YEARS DEFENSE PROGRAM

Tuesday, March 4, 2008

U.S. SENATE
SUBCOMMITTEE ON STRATEGIC FORCES
COMMITTEE ON ARMED SERVICES
Washington, DC.

The subcommittee met, pursuant to notice, at 2:30 p.m. in Room SR-232A, Russell Senate Office Building, Hon. Bill Nelson, chairman of the subcommittee, presiding.

Committee Members Present: Senators Bill Nelson [presiding], E. Benjamin Nelson, Sessions, and Thune.

Committee staff members present: None.

Majority staff members present: Madelyn R. Creedon, Counsel.

Minority staff members present: Robert M. Soofer, Professional Staff Member.

Staff assistants present: Kevin A. Cronin and Brian F. Sebold.

Committee members' assistants present: Christopher Caple, assistant to Senator Bill Nelson, Todd Stiefler, assistant to Senator Sessions, and Jason Van Beek, assistant to Senator Thune.

OPENING STATEMENT OF HON. BILL NELSON, U.S. SENATOR FROM FLORIDA

Senator Bill Nelson: Good afternoon. The hearing will come to order. After this open session, we will adjourn to S-407, where we will do this on the classified level.

I'm going to forgo a statement. We will put it in the record. [The prepared statement of Senator Nelson follows:] [SUBCOMMITTEE INSERT]

Senator Bill Nelson: When Senator Sessions gets here, we'll do whatever he wants. I am going to put into the record each of your opening statements, and we are not going to take the time for you to sit here and read to me your statement. It's in the record.

STATEMENT OF GARY E. PAYTON, DEPUTY UNDER SECRETARY OF THE AIR FORCE FOR SPACE PROGRAMS [The prepared statement of Mr. Payton follows:]

STATEMENT OF GENERAL C. ROBERT KEHLER, USAF, COMMANDER, AIR FORCE SPACE COMMAND [The prepared statement of General Kehler follows:]

STATEMENT OF LIEUTENANT GENERAL WILLIAM L. SHELTON, USAF, COMMANDER, JOINT FUNCTIONAL COMPONENT COMMAND FOR SPACE, UNITED STATES STRATEGIC COMMAND [The prepared statement of General Shelton follows:]

STATEMENT OF REAR ADMIRAL KENNETH W. DEUTSCH, USN, DIRECTOR, WARFARE INTEGRATION, OFFICE OF THE CHIEF OF NAVAL OPERATIONS [The prepared statement of Admiral Deutsch follows:]

STATEMENT OF CRISTINA T. CHAPLAIN, DIRECTOR, ACQUISITION AND SOURCING MANAGEMENT, GOVERNMENT ACCOUNTABILITY OFFICE [The prepared statement of Ms. Chaplain follows:]

Senator Bill Nelson: So let us just get right on into the questions.

We constantly hear about the spiraling need for communications. Let's talk about TSAT. It's supposed to address some of the growing requirement and has been described by the Air Force as the linchpin for the 21st century net-centric warfare. TSAT was, at one point, supposed to launch in 2012. Congress removed \$130 million from the program and then in the next year \$150 million, mostly to allow technologies to mature so that the program wouldn't be high risk.

When the '08 budget was submitted, the first launch was supposed to be in the first quarter of 2016, and the First Year '09 budget request completely undermines the program. The Defense Department and the Air Force have pulled \$3.6 billion out of the program through the fiscal year 2013 and have delayed the first launch until 2018 at the earliest, and the requirements for TSAT haven't changed. So what's going on?

Mr. Payton: Mr. Chairman, perhaps I could address that. The TSAT spacecraft will be an immensely capable vehicle. It will serve a large number of users, first and foremost perhaps is protected strategic communications for our nuclear command and control systems. Additionally, it will serve relay for airborne ISR assets like Global Hawk, also space-borne ISR assets. It will serve fleets on the high seas. It will serve COM on the move for our land forces, and of course, it is closely related with the Army's future combat system.

As we move to AEHF-4, the fourth AEHF spacecraft, that vehicle completes a global ring of geosynchronous satellites for protected strategic communications. With the fourth AEHF spacecraft, we now have no longer that first immediate schedule driver for the first TSAT spacecraft. With that as a fact, we are now looking at that first block of TSAT spacecraft and how we can best marry its capabilities to the schedules of its users.

Again, with AEHF-4 filling the ring for protected strategic communications, we can now rephrase the TSAT capabilities so that it can service the most important users first, again, amongst all the large number of different users it will have.

And so, we are taking this time from December until this spring to rephrase the first block of TSAT capabilities and redefine that. We are not necessarily married to a 2018 launch. Again, that is part of the trade space to link up TSAT capabilities with its users.

Senator Bill Nelson: Well, what you have said is that part of the cut in TSAT is justified by the Air Force as a payment for the fourth AEHF, and I guess there were other higher DOD priorities. So I go back to the initial question. If TSAT is still the linchpin for the 21st century net-centric warfare, what is the higher DOD priority?

Mr. Payton: Sir, we have, again, it is a program- management, program-risk perspective of properly marrying and fielding the TSAT capabilities with its next immediate users.

Senator Bill Nelson: Did you say that you were on a 2018 launch date instead of a—

Mr. Payton: No, sir. No, sir.

Senator Bill Nelson: 2016?

Mr. Payton: We do not know yet what the first spacecraft launch schedule is like until we define the content of that first block of spacecraft.

Senator Bill Nelson: So you don't even know that you are on a 2016 launch date?

Mr. Payton: Any schedule prediction right now is premature, sir.

Senator Bill Nelson: Well, that is some new information.

Mr. Payton: We will be—we are currently in work with both the user communities, the Marines, the Army, the Navy, the Joint Chiefs of Staff to identify the schedules for their top users. We are working with the technology folks, obviously. We have spent several years proving the technology readiness at the subsystem level. And so, we are again in the process of re-architecting that first block of TSAT capabilities.

Senator Bill Nelson: Tell me about if we are going to have this kind of delay, is there also going to be a requirement to buy more wideband global SATCOM systems?

Mr. Payton: That is part of the analysis that is in work this spring. Yes, sir.

General Kehler: Mr. Chairman, if I could also add something to what Mr. Payton is saying? Sir, you said it exactly right when you framed the question—when you said the requirement for warfighting capabilities that are promised through TSAT have not gone away.

We know that the objective here is to get protected communications farther and farther and farther down into the forward echelons, which allows them to communicate in a protected way on the move, and that really is the—one of the key drivers to go beyond where we are right now with WGS and Advanced EHF.

But we should not lose facts, sir—should not lose sight of the facts, sir, that we have just launched the first of what will now be six WGS satellites, which are a quantum leap in wideband communications.

We are about to launch within the next year, we believe, the first of four now Advanced EHF satellites, which again are in a quantum sense far more capable than the systems that they replace.

MILSATCOM remains a top priority for the combatant commanders. We understand that it does. We think that the steps that we are taking right now are giving them vastly improved communications. What this does allow us to do with the insertion of the fourth Advanced EHF is to take the investment that we have had in TSAT so far, particularly in the ground system, which we will have to continue regardless, and it allows us now to take the next couple of months to assess what the pace and scope of TSAT needs to look like.

And that is the pathway that we are on. There is a study under way. It is not a brand-new study. We have looked at this a lot of different ways, and we owe you some answers on this.

Senator Bill Nelson: Admiral, what does the Navy think about the delay on TSAT?

Admiral Deutsch: Well, sir, obviously we have stated our requirements for protected communications a number of times, and how those protected communications are delivered to our sea base and our fleets at sea is certainly important. But as long as they are delivered, that is the most important thing.

We are very concerned that the protected communications remain available and that they are in sufficient capacity to allow us to have the reach-back that we need based upon the way we intend to fight the future conflicts.

Senator Bill Nelson: You said as long as they deliver it, but the question is "when?"

Admiral Deutsch: Yes, sir.

Senator Bill Nelson: So what do you think about that?

Admiral Deutsch: Well, sir, we certainly are interested in more protected communications available as soon as possible. With the current schedule, we believe that the sea base will remain viable. We would like to see more.

Senator Bill Nelson: Ms. Chaplain, GAO has been critical of this acquisition path for TSAT. What is your assessment of this progress, and what is your assessment of this new information that we just got today?

Ms. Chaplain: I think everything that has been described today is actually some good actions being taken to make the TSAT program more executable, more affordable, and also to ensure that there is no capability gaps in the upcoming years.

But I have always said that this investment needs to be looked at in the context of the DOD-wide systems portfolio, not just space because, as you said, it is the linchpin for the future global information grid. There is a lot of huge systems depending on this to achieve their kinds of capabilities. I think it is not just FCS. So I think when we talk about priorities, they need to be discussed in the context of the whole portfolio of weapon systems and just not the space portfolio.

In terms of dates being in question, I think it is important to go back to all these major systems and really get a good sense of what are their schedule delays. They are also facing delays themselves. So is any TSAT revised schedule still in synch with schedules like

the FCS program, and what are their backup plans if TSAT is not available?

I don't think just saying we can rely on other assets may be totally an answer for them. They probably need certain capabilities in the TSAT program to do what they are supposed to do.

Mr. Payton: Mr. Chairman, let me—I may have left an improper impression. The 2018 date is based on the classic analysis if you take so much money out of the program in these years, it will then slip the program so many years in the future. We are looking at something a little more granular than that or something a little more than just dollars out and schedule slipped. We are looking at the actual content. Clearly, protected COM is the top priority for the TSAT program.

I am just not accepting 2018 and the analysis that led to the 2018 as being thorough enough. It could be earlier than 2018. Again, depending on the needs of the warfighters and the TSAT's many, many different customers.

Senator Sessions: I am sorry, Mr. Chairman. I went to the other room, and I had been told you were here. I should have remembered that.

Senator Bill Nelson: I went to the wrong room also.

Senator Sessions: General Shelton, what is your take, STRATCOM's view of the TSAT delay?

General Shelton: Senator, STRATCOM has polled—as General Kehler has said, has polled all the other combatant commanders, and the other combatant commanders have military SATCOM very high on their priority lists. So STRATCOM is awaiting this analysis that is being conducted right now, anxious to see what the output of that analysis will be.

Clearly, Advanced EHF-4 is a priority now because of the slip to TSAT, but we are anxious to see what this analysis in the spring will yield.

Senator Sessions: And General Shelton again, can you tell us what role the U.S. space assets and space personnel played in the recent successful intercept of our out-of-control NRO satellite? Was that a joint operation? What lessons are we learning from this operation about command and control and integration of space assets?

General Shelton: Yes, sir. It was very much a joint operation. In fact, U.S. Strategic Command was lead for planning for this event, not only for the intercept itself, but also the consequence management and dealing with the aftermath of the intercept.

So assets included, of course, the—

Senator Sessions: Did you decide that the Navy's SM-3 was the right vehicle to utilize to take out that satellite?

General Shelton: Sir, that was General Chilton, in consultation with the Joint Staff and, ultimately, the National leadership that decided that that was the proper weapon. Yes, sir.

Senator Sessions: Did I cut you off there? Let you finish?

General Shelton: Let me just say that between Navy assets, Missile Defense Agency assets, Air Force assets, a tremendous joint effort, probably a national effort pulled off in a very short period of time. It is almost unprecedented.

Senator Sessions: I felt it was a good surprise test for the entire effort. It tested a lot of different things, including your ability to coordinate. I understand the Air Force had a role. What was their role in the process?

General Shelton: Air Force assets were used to track the target satellite.

Senator Sessions: To track the satellite?

General Shelton: Track the satellite and produce a very precise vector on where that satellite would be, because when it broke the horizon for the Aegis shooter, it needed to be in a certain size box. And we were well inside that box. So it gave a very good target for the shooter. The shooter was able to lock on, and the results speak for themselves.

Senator Sessions: Mr. Payton, maybe you can comment on that, and did the Air Force incur costs in the course of what they were doing? And what were they, and have they had to defer any other work as a result of that?

Mr. Payton: The tracking sensors that General Shelton referred to are something that the Air Force has going on 24-7, 365. So this perhaps some overtime for analysts, I honestly don't know. But there was no extra immediate costs for the Air Force to participate in this exercise.

Senator Sessions: Are you satisfied with the coordination and cooperation of so many entities that were involved in this? And do you see any need—did we learn anything that we could do better?

Mr. Payton: I think—I came from Missile Defense Agency before my current job, and this was executed as in a similar fashion as many Missile Defense Agency operations, where they do rely on several different assets from the Air Force, from the Army, from the Navy, to execute their mission. So this was just another routine exercise from the perspective of the coordination that was conducted.

General Shelton: Senator, let me make one other comment on that in terms of lessons learned, if I could? We—Chinese ASAT test as well applies here. But there is a tremendous amount of data that is available, but because of the way we are architected right now, you have to pull all of that data together ad hoc. And it is different networks. It is different levels of security. There are many different problems in pulling that data together.

Yet again, we did it this time. But what we need is a system that pulls this together on a routine basis, and that is exactly what we are working for—integrated space situation awareness.

Senator Sessions: I will ask whoever. I am not sure who the appropriate person is. But one of the things that I know we were concerned about is that the Chinese attack on the satellite was 450 miles up above our—the Space Station, and it was going to create space debris that could endanger space activity for years to come.

This was about 100 miles up, I believe, and we thought that the debris would re-enter the atmosphere. That is below the Space Station, of course. Did those facts bear out, and how are we doing with the debris situation? Were you accurate in your projections that the debris would not threaten the Space Station?

General Shelton: Sir—for both the Chinese ASAT test as well as the intercept, the models that predicted the debris field did a pret-

ty good job. Chinese ASAT test produced debris up at 850 kilometers, the engagement altitude, and that debris will literally rain down, naturally decay over decades.

The test that was done occurred at 247 kilometers. That debris will probably, 90-plus percent of it, will be down within the next 2 months. We are tracking—what we can track right now is 10 centimeters, roughly. We are tracking about 193 pieces left on orbit right now, and that will rapidly decay.

So very different not only in terms of motivation for the event, but very different in terms of debris fallout.

Senator Bill Nelson: Admiral, let us go to another program—Multiple User Objective System. UHF-band communication satellite. It is scheduled to launch in 2010, around March. What is the current status on this? Is its launch still on?

Admiral Deutsch: Senator, I would like to say that it is doing fairly well on schedule. As a matter of fact, I think the schedule performance index is at about .97 right now. So we are still doing very well on schedule.

We expect to launch—actually, sir, I think the actual launch will be in December of 2009, with initial on-orbit capability of March 2010. There is pressure on the schedule. I won't sit here and promise you that that will definitely be the date that it will launch. We are now in single-line flow, and with your experience, you are well aware of what happens at that time.

That is where you get into the situations where, if you have a problem, you may have to stop and redesign a component. And we have had a couple of components that have had some issues and have eaten up some of the margin. Having said that, we have successfully solved those component issues, and we believe that we are still on track for the initial launch in the winter of 2009.

Senator Bill Nelson: There have been technical issues with the follow-on UFO satellite, so that there is likely to be a gap between a UHF and the UHF capability. What is your analysis of this gap?

Admiral Deutsch: Senator, the gap that you referred to is the gap between the likelihood or the probability of eight functioning satellites on orbit, eight UFOs, if you will. And that has been established by STRATCOM, in consultation with the COCOMs, to be a 70 percent figure is what is desired.

As of this month, the likelihood that there will be 70 percent of the satellites still on orbit, that date is now within 9 months of the on-orbit capability of the first MUOS. So we have about a 9-month gap between the 70 percent availability and then a replacement satellite capability, which, as you know, each MUOS not only carries a MUOS package, but also a UHF legacy package as well. So about a 9-month gap right now, sir.

Senator Bill Nelson: Now that capacity, is that the commercial UHF capability?

Admiral Deutsch: No, sir. The commercial capability not only the LEASAT that is currently up and its fuel is expected to remain through about 2010, that is not factored into the 70 percent availability, nor is the commercial UHF capability that we are working on providing as part of the President's submit to Congress.

Senator Bill Nelson: Well, has the Navy started the process to acquire commercial UHF?

Admiral Deutsch: Yes, sir. Not only leasing, but also a hosted payload option. The leasing is besides what we have right now on LEASAT, as I just mentioned, we also are working on with INTELSAT SKYNET. We have money funded in the '09—I should say we have money programmed in the 09 submittal for '09 and '10 leases, year fiscal year '09, fiscal year '10 leases. And we are also in the pre-solicitation synopsis release phase for the hosted payload.

We have an industry day this month, as a matter of fact, to talk to industry about potentially hosting a payload. And in our submittal to you, sir, we have money dedicated towards that.

Senator Bill Nelson: Jeff?

Senator Sessions: The Chinese counterspace program by all accounts represents a significant commitment on their part. Yesterday, DOD released its '08 report on, quote, the military power of the People's Republic of China." It highlighted their growing counterspace capability, which includes nuclear-tipped missiles; direct ascent ASATs, which we have seen; jammers; anti-satellite lasers; and radio frequency weapons. They are also building a domestic capability for the production of micro satellites, which could be used as space mines or space parasites.

I will just ask this to you, and I am not sure who should be in priority to answer it. What value does China see in these counterspace weapons? How would they use them in a conflict? What do you think their ultimate objective is in terms of size and scope of the program? Who wants to—General Kehler?

General Kehler: Sir, let me try this on. As a force provider for Strategic Command, which is what Air Force Space Command is, we wind up having to provide the Strategic Command space capabilities that can operate during times of conflict, and so this is a big issue for us.

Let me start by saying, though, that as we look at the space domain today, the evidence that we see looks to be pretty clear. We have got to expect that the space domain will be contested in any future conflict. We see evidence that potential adversaries and others are preparing to deny us the advantages that we have in space in lots of different places. The Chinese are one of those.

As we look at them, the answer to the questions that you posed, though, is probably the most puzzling to us, and that is we don't know. It isn't clear to us what their intent really is. In terms of their acquisition, in terms of the anti-satellite test that they conducted a little over a year ago, and what those implications are for us for the future.

What we believe we have to do, though, is be prudent. And therefore, we are preparing to have to continue to provide our space capabilities in a contested environment. And we are working very hard on that. And so, sir, I can't answer for you directly—I am not sure anyone can answer directly where we think the Chinese are going here.

I did read the report from yesterday. Fundamentally, it is information that we have been reporting to Congress in various venues. The key question, I think, and the report poses this question is "why?" What is it that they are doing, and what is their intent behind the visible activity that we can see?

I can tell you that it is concerning to us, and those of us that are forced to prepare to provide military capability in conflict have got to take account of the fact that we see the kinds of things that were shown in the report that was issued again yesterday. And I believe that we are on a good pathway to address those. And I also want to suggest to you that the Chinese are not the only folks that we watch with concern.

Senator Sessions: Well, I am sure that is true. What about Operationally Responsive Space? It seems to me that throughout our Defense Department procurement, we need to be looking for capabilities that are less expensive and have substantial volume and a quick response time and ability to deploy promptly.

I had a professor in college that talked about before it became, I guess, so common to think about the Russian tanks and the German tanks. The German tanks had leather interior and cost a fortune. But, as he argued, all it was was a piece of metal with a gun that could hit his target. You get more of them, you are better off. So it could be less attractive and superb in a lot of ways, but still be able to do the job that we need doing.

So let me ask this, General Kehler first. What are we starting to learn from the TSAT-2 experiment that we had in terms of, one, developing small technology satellite technology; two, improving our acquisition approach to satellites and launch vehicles; and, three, operational concepts related to warfighter? Would you start off with that, and I will ask anybody else to contribute?

General Kehler: Yes, sir. First of all, I believe you are referring to TACSAT-2, and let me say at the outset that improving our responsiveness across the board is something that we think is critically important. And ORS —

Senator Sessions: What do you mean by responsiveness,” for someone who might be listening in and not know what you are talking about?

General Kehler: It covers a range of things for us, as a matter of fact. We have chunked this up, if you will, into three tiers’ worth of what we think about responsiveness. The first is how do you make your existing capabilities more responsive? And my colleagues and I believe that helping ourselves on the ground—which may sound a little odd here—but helping ourselves on the ground is the first step to being more responsive. That is, how do we make more responsive the things that are on orbit today?

And in many cases, the way we have to go about that is by making the ground systems more responsive, using those platforms that are on orbit in better and more efficient ways and handing information, in many cases, directly from the platforms to the warfighters, which is something that the warfighters have always demanded.

So first step for us is to make the existing systems more responsive, and largely, that is something—

Senator Sessions: More responsive basically to the warfighter?

General Kehler: More responsive to the warfighter in terms of being more timely and handing product over to them, whether that is imagery or whether that is communications product, whatever. Getting that farther down into the warfighting echelon sometimes is helpful as well.

Then the second step for us is how do we make in big terms acquisition more responsive to the warfighter needs. As the GAO points out, it takes us too long to put things on orbit, and we have been addressing those issues. Part of our Back to Basics approach, for example, in acquisition, part of acquisition corrections that were made as a result of decisions we made in the 1990s, et cetera, et cetera, all apply here. And I believe that we can even do more in terms of coming up with a strategy that helps us to deploy capability sooner.

In fact, we have people off looking at that to—maybe we can come back and have a discussion with you at some point about the strategy that we have been on, the relatively small number of large platforms versus a large number of small platforms. Your tank analogy, if you will. I think that is a great question for us to ask ourselves.

And of course, ORS. Then how can we position ourselves to have the ability as a national strategic capability to put platforms on orbit maybe within months as opposed to years? And that is what ORS is all about. How do we make that affordable? How do we make that achievable? How do we make all of that feasible?

And to come full circle to your question, I think what TACSAT-2 showed us, which was really the first of the experiments that we put on orbit that tries to follow a more rapid, smaller way of conducting our business, what that showed us more than anything else, more than the technical capability of the platform was it validated the concept.

It validated for us that this makes sense for us to have in our toolkit as we try to improve our responsiveness across the board that at the one end of our ability to deploy capability, we want to have something that can put a smaller platform up there, maybe has a single purpose, doesn't last more than a couple of years, applies its output directly to the warfighter, is controlled by the warfighter, and is something that we could have as a replenishment, for example, capability if, in fact, we take losses on orbit or augmentation to supplement some capability that is up there.

It is very, very promising to us, and I believe that the output of TACSAT-2 was a validation of the concept, not as much about the technology. That, we will get better at as time goes on. There were technologically good things about TACSAT as well, but I think, more importantly, it was a validation of the concept. It also helped us understand better where the gaps were in the concept. And so, it helped us come back and address where those are and get those closed.

Senator Sessions: Well, I guess we know that there is a threat to any satellites we put up, that it is not—a lot of nations have the capability, if they put their mind to it, to threaten those capabilities. One response to it would be to be able to put another one back up on a very short notice, would it not? Would you agree with that?

General Kehler: Yes, sir. And that is—

Senator Sessions: So I guess my question is, are we moving—we talk about it. But my question is, are we moving to have a low-cost launch systems, a low-cost satellite that would meet just those qualities and capabilities you mentioned for the warfighter and make sure that at least the people we have got in harm's way are

able to maintain the capabilities of our future combat systems that all require satellite capability?

General Kehler: And the answer, Senator, is, yes, sir, we are.

Senator Sessions: Secretary Payton, you want to comment—

Mr. Payton: One of the critical elements of shortening that time-frame to be more responsive to the combatant commander is to shorten the amount of time it takes to assemble the spacecraft and put the requisite payload sensors on that spacecraft. That is called plug- and-play spacecraft.

We currently have four TACSATs that have been defined. One has been launched. The other three are in different stages of preparation for launch. The fifth TACSAT will fly that conceptual plug-and-play spacecraft, a demonstration where we can plug together a spacecraft similar to the way laptop computers are plugged together after you phone the company and say, “I need this kind of hard drive and this kind of memory and this kind of display.” They plug and play a laptop for you. That is the same construct that we will demonstrate on TACSAT-5.

Senator Sessions: Well, it seems to me we would want to have in inventory some satellites that I don’t mean weeks, I mean within days could replace one that fails or is damaged in some fashion. Is that part of your vision?

General Kehler: Yes, sir. And again, we are headed in that direction. I would describe the current Operationally Responsive Space effort, though, in crawl, walk, and run terms. We are crawling. I believe we are about to start walking.

When we cross those thresholds, what we are doing with the ORS program right now is we are essentially developing the piece parts that allow you to get to a more and more and more responsive solution. And when you get there, I believe you are then to the point where if you decide, some things may go on the shelf for immediate use, some things may be assembled and purchased within months, which may be sufficient to respond to warning. We will have the capability—

Senator Sessions: Well, we have—I see ’09 through 13 fiscal year budget calls for \$550 million for Operationally Responsive Space. It appears to me to be modest. Who wants to comment on that? Well, you are required to answer. What do you think? Who wants to—

Mr. Payton: I will give that a shot, Senator. Again, we have to crawl, walk, run. And our first investments are into what we call enablers, like the plug-and-play spacecraft, like a spacecraft control center that can handle more than one kind of satellite constellation at a time, sort of a multi-mission spacecraft ops center, where one person flies a certain kind of satellite in the morning and that same person is trained and qualified to fly a different kind of satellite in the afternoon.

So we have to—and additionally, we have to improve some of our ground support equipment. Right now, there is a launch vehicle called the Minotaur. We can only process one Minotaur at a time. Now we may need to be in the business of processing a Minotaur up in Kodiak, Alaska, for a launch and a different—at the same time, one out of Wallops Island here in Virginia.

So we have to invest in some of the fundamental enablers that sometimes are exotic, typically are not. And those are where we are putting our money right now. Equally important, we are working with Strategic Command, who represents the combatant warfighters—the geographical combatant warfighters in this case—and quantifying what sort of capabilities, what sort of needs do those theater combatant commanders have for systems like ORS. And so, we are in the sort of the business ops side of it, quantifying what the theater commanders need, while additionally in parallel, we are working on those enablers that allow us to migrate from crawl to walk to run.

Senator Bill Nelson: Well, Admiral, with regard to this Operationally Responsive Space, is the Navy—are you satisfied you are part of this? And you have at least one senior scientist in the office.

Admiral Deutsch: Yes, sir, we are satisfied. I mean, we would like to play a larger role. We certainly would like our research laboratory, NRL, which has a pretty distinguished history in space and has a lot of talent, to also play a larger role. We are working it through the requirements process.

And of note, like the fellow services, we are strongly in favor of making the ORS office a joint office with a rotating director. And this year, we will nominate an individual to perform as the director of the Operationally Responsive Space office. So if we are lucky, we would certainly like to have that individual serve, and we look forward to, as General Kehler and Secretary Payton mentioned, we look forward to advances in ORS.

We think there is a need for it within Navy's requirements. And there will be a growing need, as recent events have shown, in the future to be able to rapidly replenish and to put capability on orbit.

Senator Bill Nelson: Do any of you all need any new authority to make the office more efficient, more effective?

Mr. Payton: We looked at that closely. Initially, we thought there was all sorts of inhibitions to an organization like we have in Albuquerque. Come to find out the single-largest benefit would be if their money were all R&D money, instead of being divided up into procurement or O&M or science and technology money. If all of their budget was single color money, R&D money, that adds a lot of flexibility to how rapidly they can respond to warfighter needs.

Senator Bill Nelson: What was going on? There was an issue about the ELINT payload on TACSAT-2. What was the issue, and what was the resolution, and what was the lesson learned?

General Shelton: Senator, the problem was SIGINT operational tasking authority, and that is the purview of the National Security Agency. So getting that authority—that had not been worked out ahead of time. That is one of the key lessons learned from TACSAT-2. That, I am confident, will never happen again. We will work that well ahead of time and get the NSA's permission to have that operational tasking authority that is needed.

Senator Bill Nelson: And TACSAT-1 is supposed to come launch this June or July. Are you ready to go? Are all of the issues resolved?

General Shelton: To my knowledge, Senator, we are ready to go. I think it is more of a booster problem than anything.

Senator Bill Nelson: Ms. Chaplain, GAO has been looking at the standup of the ORS office. What do you say?

Ms. Chaplain: As you can hear today people talking about ORS, you realize that there is a lot of efforts involved with this program. Many on the short-term side, which involved developing these TACSATs and launching them, and also addressing potential capability gaps in some of the acquisition programs.

There is also a very long-term effort to ORS to get to this vision of having satellites on the shelf ready to go at any moment. In addition to plug-and-play, that includes having common interfaces, having well-understood common design practices, and also having low-cost launch. And our concern, while we thought the ORS effort is doing a pretty good job of standing up the program office and getting staff and progressing with these S&T efforts, our concern is that over the long run, there is a chance that some of these short-term demands may end up overwhelming the long-term effort.

So we have to keep our eye on things like getting low-cost launch and keeping up with the design effort and things like interfaces. So, in our review, we are going to be recommending that there be an investment strategy to help guide this program office. It is a small office. It doesn't have like long-standing clout, like a huge acquisition program has. So it may have trouble negotiating a lot of the demands being placed on it if it doesn't have strategy and good support from above.

General Kehler: Sir, if I could add something to that? Inside Air Force Space Command, we now have the Space and Missile Systems Center, the large acquisition house. And a key issue for us all along here for ORS has been how do we attach the ORS office so that it can leverage the capabilities that are brought in, the money that is brought by the Space and Missile Systems Center.

We are still working our way through that. The way we have done it today is that we have dual-hatted the director of the ORS office. So not only is he the director of the ORS office, but he also has a role in the Space and Missile Systems Center.

That has been very helpful to us. And regardless of how we go with the leadership—and it is a joint office. And so, regardless of where we go with the leadership, we intend to make sure that that relationship remains in whatever way we can make that happen because GAO is exactly right, that there has to be some attachment here for a smaller organization that will have to leverage the larger organization. And we are committed to making that happen.

Mr. Payton: And speaking on organizations, again, the ORS office has Air Force, Army, Navy people onsite in Albuquerque. Additionally, there is a NASA representative onsite in Albuquerque from NASA Johnson Space Center, and even an NSA person is assigned there now, again to help us with the lessons that we learned from the first TACSAT-2.

Senator Bill Nelson: Back on the issue of debris, General Shelton, what is your modeling and simulation roadmap?

General Shelton: Right now, Senator, we have an aerospace effort—aerospace corporation effort that provides that modeling and simulation capability for debris. That is also peer reviewed by some NASA work, and I think there are very consistent results between

NASA's modeling efforts and aerospace's modeling efforts. So I think we have got kind of the best of all worlds here, where we have got experts in DOD, experts in NASA whose results agree very closely.

Of course, NASA is focused on the manned spaceflight side of things, and DOD is focused on the broader issues of spaceflight. But to have that agreement, I think we are doing very well on debris modeling.

Senator Bill Nelson: All right, on this same issue, we had to move some satellites to avoid debris from the Chinese. Has there been any satellite that has been damaged by the debris?

General Shelton: Not to our knowledge, Senator. We have moved a couple, as you are aware. But that has not resulted—neither of those resulted in damage, nor anything that we have seen to date that we can track that back to debris from the Chinese ASAT test.

Senator Bill Nelson: All right. And what have your models shown that the Chinese debris is no longer going to pose a risk?

General Shelton: It will be decades before all of that debris is down. Now, having said that, the models put the risks—the overall spaceflight risks on the order of 10 to the minus 6, which is 1 in 1 million. But that is if you take great solace in probabilities.

Senator Bill Nelson: All right. I am going to go SBIRS next. Senator Ben Nelson, did you want to get in on any of these issues we have discussed thus far?

Senator Ben Nelson: Well, I am not sure I know all of the ones that have been discussed so far, but I do have a couple of questions.

Senator Bill Nelson: Go ahead. And then you finish, and we will let you take off.

Senator Ben Nelson: Okay. Well, thank you, Mr. Chairman.

And first, I want to welcome all of you here today. Thanks for your service, and much of what you are involved with today is clearly going to assist us in this global war of terrorism.

My first question is—relates to the recapitalization and modernization. General Moseley has already said that the Air Force needs to recapitalize and modernize its fleet of both air-breathing and space systems. And of course, we are familiar with the new fighters, new bombers and tankers, and everything that is on the drawing board as well as those that are have not been financed so far.

But as we look at the Space Command, what space systems might be old and failing? And I am thinking in part about all of the assets that are in the ground out in Nebraska and other areas, the missile systems that are there. And consequently, would that be part of the recapitalization to try to extend the life 20 to 30 years of some of those assets that are already in the ground there?

I guess I would ask you, Secretary Payton?

Mr. Payton: Yes, sir. We have a plan to go to the year 2020 with our Minuteman fleet, and we have just finished a series of significant upgrades to that fleet. As we conduct aging tests with the technology in that fleet, we will be able to judge more accurately, but we think the technology improvements we have made recently can probably go to 2030.

So we do know certain areas of the missile system that will need upgrading—avionics in the guidance package, for instance—but we are confident that we can get at least to 2020 and high likelihood to 2030 with the upgrades that we have just finished for the Minuteman.

Senator Ben Nelson: Do the generals agree with that?

General Kehler: Sir, let me put a little bit finer point on what Mr. Payton has said. The Air Force Space Command does, in fact, have responsibility for the Nation's land-based ICBM force. And Congress has approved, over the last 5 or more years now, almost \$7 billion in service life extension, if you will, to Minuteman. And we are getting to the end of that time.

We are very confident that we can take Minuteman to 2020. This has been service life extension of the boosters, the guidance system, the bus that carries the payloads if the need should arise, et cetera. We have also made some substantial investment in security improvements with additional concrete on the launch facilities, remote cameras, and other things. So we are very confident we can go to 2020.

You in Congress have asked us about going from 2020 to 2030, and quite honestly, we are still looking at that very hard. There is one school of thought that says that we can go to 2030, and I tend to think that that is possible. But what I don't know is what additional investment will be required to do that. And so, we owe you some answers on that.

We owe ourselves some answers on that as well. I am not ready to stand up and say that that system definitely can go to 2030. It looks like the work that has been done and the congressional support that has gone on so far puts us in a good position for that, but I think it is fair for us to take a harder look.

We have never gone there before, sir, and much like some of our aging aircraft that we had some issues with, we don't know what Minuteman as a system behaves like when it gets over the age of 50 or 60 or approaches 70. And so, that is something that we are going to have to come back and tell you.

Senator Ben Nelson: Well, in that regard, 5 years ago, there was a position—well, the Deputy Secretary of Defense signed out a policy letter designating the Air Force as the executive agent for space. That seems to have been successful for us because at least the Back to the Basics approach seems to generate what we would hope in the way of expertise as well as a plan.

But the position of the Under Secretary of the Air Force is vacant, and I guess, Mr. Secretary, what is the Air Force's view regarding that position, if you know? Will it remain vacant until the end of the administration's time, and is the Air Force's view of the executive agent still operative today?

Mr. Payton: Yes, sir. The DOD instruction, the DOD document that empowers the executive agent for space says that the Secretary of the Air Force is—in the person of the Secretary of the Air Force is the executive agent for space. That individual can delegate that once to the Under Secretary of the Air Force. The Under Secretary position is vacant right now. I cannot predict if it will be filled. It is a nominative, confirmed position.

But we are fortunate in that Mr. Wynn, the Secretary of the Air Force, is very extremely knowledgeable in the space business, both launch vehicles and ground control segments and satellites, due to his background.

Senator Ben Nelson: Well, I certainly wouldn't suggest that he is not knowledgeable. I guess my concern is that without that space being—that position being filled, that he already has enough to do without taking on the under secretary's position. Or if he could do it, maybe we don't need the position of the Under Secretary?

I am just hopeful that we won't saddle the Secretary with more than we should.

Mr. Payton: Yes, sir.

Senator Ben Nelson: Based on the fact that that position is there.

Mr. Payton: Sir, again, I cannot project into the future if there will be any nominees or anyone that—

Senator Ben Nelson: Maybe I should call him and ask him, huh? I won't tell him you suggested that. It was my idea.

One final thing, with the end of the Cold War, there seems to have been a pause in our investment in the U.S. nuclear community. And so, in a February 10th LA Times article, the U.N.'s chief watchdog, Mr. El Baradei warned that the most imminent threat is not a new nation joining the nuclear club, but rather deadly material falling into the hands of extremists.

With the risk of extremists pursuing dirty bombs, as we know, and also concern about anti-proliferation, are we in a position where we need to reinvest in new personnel and in new technology and new assets in this area? And I guess I would ask you, General Kehler.

General Kehler: Sir, first of all, proliferation concerns us very much. And attempts at counterproliferation, of course, are ongoing at all levels. In terms of our own nuclear forces, I can speak for, again, land-based strategic deterrent inside Air Force Space Command. When I took my job in October, the first question that I had was are we being good stewards of the Nation's land-based strategic deterrent? And the answer that I came to was, yes, we are.

I did that in a combination of visits to our field commanders, some assessments that our field commanders had done. And the fact that we went back and reviewed the standards that we have for our nuclear activities, which, by the way, have been in existence for over 50 years now and, in some cases, since the end of the Cold War have gotten more stringent.

But what has changed since the end of the Cold War, there are some things out there that concern me. One is security. The good news is that the number of weapons since the end of the Cold War have declined drastically, and that is good. That is the way all of us wanted—

Senator Ben Nelson: And that is assuming that we know where the decline, where those that have declined are resident right now. Is that right?

General Kehler: Yes, sir. Well, we certainly do. We know where ours are.

Senator Ben Nelson: Yes, but I am not—I am a little less concerned about—I am obviously concerned about where ours are.

General Kehler: Yes, sir.

Senator Ben Nelson: But I am less concerned about that than perhaps where the others are.

General Kehler: And that is the proliferation issue. What we have seen, again, in our own house is certainly with the decline in numbers came the decline in number of people associated with the nuclear mission, which inherently in that decline in the number of people, we have a decline in experience, and that is what concerns me.

And so, we have done a number of studies in the Air Force, and those outside the Air Force have helped us look at this, in the last 6 months or so. And there have been a number of recommendations made that we are now in the process of implementing to try to make sure that our experience base is firm, that we have made the investments that we need to make, that we are complying with our standards, that we have not taken our eye off of this most important, in my view, of all the balls that we have.

And so, we are addressing some recommendations at this point in our command that get to, for example, even increased security beyond where we find ourselves today. It gets to some changing in operating concepts and the way we do our business in the missile complexes to put security and surety first. And so, I am very comfortable that we are on the right paths.

I will remain concerned about our experience level. We have gone back to basics on that as well. We are going to make sure that we have done everything we can do to grow people with the appropriate experience, and we will pay attention to that and are already paying attention to that in many different ways.

So the long answer to your question is I believe that we can have high confidence in the way we are operating our land-based deterrent force today. I am concerned about proliferation. Of course, that is a concern across the board with us, and we do have some issues to go address in light of some of the reviews that we have done recently, and we will go address those.

Senator Ben Nelson: Will the authorization request that we have, that we are looking at, will that adequately handle the staffing requirements that you are talking about with the developing the new expertise or the expertise in light of where we are today? And is at all adversely affected by the reduction in end strength within the Air Force?

General Kehler: Again, speaking from within my command, I do believe we are adequately addressing this. This is largely the use of the people that we have, and it is making sure that we are fostering the development of certain folks who, from second lieutenant all the way up, are going to be developed as nuclear experts. And I think we have a commensurate concern with the laboratories and elsewhere across the nuclear enterprise of whether we have the appropriate experience, whether we have the appropriate industrial capacity here to do what we need to do, and I think those are all good questions that are being addressed.

But from my perspective—

Senator Ben Nelson: Okay, as long as the budget, as long as the request is adequate for that. Because what I don't want to find is that, for example, the Air Force budget for planes and so forth is inadequate to the tune of \$20 billion per year for each of the next

5 years, which is outside the budget and not part of the authorization request at all, but we are going to be presented with trying to deal with that.

I hope there are no surprises of that kind dealing with the nuclear arsenal and the space issues.

General Kehler: Sir, again, I can't speak outside my command. I can tell you that inside the command, I believe that we are adequately resourced.

Senator Ben Nelson: Okay, all you can do.

General Kehler: I will also add, though, if I may? One of my concerns in extending Minuteman from 2020 to 2030 is beyond the boosters, et cetera, it also goes to the weapons—

Senator Ben Nelson: Sure.

General Kehler:—and whether we will have the appropriate industrial capacity to do everything we need to do for the weapons.

Senator Ben Nelson: When will you know what would be required?

General Kehler: Those assessments go on all the time. In terms of the stockpile, the warhead stockpile, those assessments are going on constantly. What we don't know yet is what we don't know about how some of these things age.

And again, there are other efforts under way to make sure that we don't find ourselves in a very awkward position, and there are other folks besides me working with other committees here on the Hill to take a hard look at the weapons complex itself. I can't speak for that here other than as a consumer, as a customer of that, making sure that we are addressing it.

Senator Ben Nelson: I understand.

Thank you, Mr. Chairman. You have been very tolerant. Thank you.

Senator Bill Nelson: Senator Thune?

Senator Thune: Thank you, Mr. Chairman. I thank you all, gentlemen, very much for your service and for being here today.

I know the Chairman is anxious to move into closed session, but I wanted to find out and maybe these are questions that could be asked in that setting if they can't be answered in open session. But I wanted to get to this issue of the shutdown of the malfunctioning spy satellite a few weeks ago. And I applaud the Navy's successful shutdown, but I also at the same time want to touch a little bit on the cost of a malfunctioning satellite because, obviously, whenever we shoot down something like that, we are blowing up a large amount of money on that particular item.

And so, I guess to the extent that you can discuss this in open session, I am curious to know do we know what the malfunction was? What caused it? What is the cost of losing that satellite? And perhaps then maybe the question about how do we hold the contractor accountable? Do they reimburse the Government? Those sorts of questions, if anybody, Secretary, can answer that?

Mr. Payton: What we can say—I believe what we can say at this juncture is that it is an NRO satellite that had—that was the target, and that is the limit of what we can say in this forum.

Senator Thune: Okay, so those are all questions for another time.

Senator Bill Nelson: If you can go with us to 407?

Senator Thune: That is where we are going to go next?

Senator Bill Nelson: And ask that same question.

Senator Thune: Okay.

General Kehler: Yes, sir. However, I would just add one other thing here. None of us sitting here represent the National Reconnaissance Office today.

Senator Thune: Right.

General Kehler: So I know I can't answer the specifics of your question. So I don't want to create an impression that we can go somewhere else and—

Senator Thune: Answer that question.

General Kehler:—answer. I can't, and I don't think anybody else at the table can either.

Senator Thune: Okay, let me ask, Mr. Secretary, as you know, last month the Chinese and Russians put forward a treaty proposal that would ban space programs. I am wondering if you could comment on that proposal and what the administration's position is on the general principle of a space weapons ban?

Mr. Payton: Yes, sir. The presidential policy from August of '06 on space says that arms control agreements or restrictions must not impair the rights of the United States to conduct research, development, testing, or operations in space. That is founded on a couple of principles. As a military acquisition group, we respond to what the President would say, clearly. But some of the difficulties of a space treaty of some sort would revolve around definitions and verification.

Some of the best treaties, strategic treaties in recent memory have been founded on trust, but verify. And so, the verification regime would be very difficult for space weapons. For instance, a routine satellite that is up there doing a normal job could, toward the end of its life, as its last act, run into another satellite and, therefore, become an ASAT.

So it is how do you verify that it won't do that? And how do you define an ASAT in the first place? Earlier, early in the Shuttle era, the Soviet Union was concerned that the Space Shuttle was an ASAT, which, of course, it could not be. So the basic fundamentals of trust, but verify would be fundamentally impossible to do in space.

Senator Thune: I know you have kind of exhausted the Chinese anti-satellite test last year, and you talked, I think before I got here, maybe a little bit about the whole issue of proliferation. But I am curious to know if the panel could discuss how the notion of prompt global strike fits into countering those types of anti-satellite attacks. General?

General Kehler: Yes, sir. I will take a stab at this, again, as a force provider for Strategic Command. The commander of Strategic Command has asked us to participate with both the Navy and the Army in investigating technologies and how we might give to him a capability to do prompt global strike. The objective is deterrence.

And so, at least from our perspective, as we would be looking to provide such capability to Strategic Command, the objective would be to enhance our deterrent posture. And in any ways that we can enhance our deterrent posture, we think that we are preventing, hopefully, a conflict to begin with. And if we can prevent a conflict,

then we are into this discussion of a contested space domain as part of a conflict.

So our view is that this has potential to contribute to our deterrent posture and in that way gives the commander of Strategic Command another arrow, if you will, in the quiver to use potentially in a conflict and, therefore, could hold some very important things around the world at risk. Whether that is a proliferating weapon that we discover somewhere or whether those are other kinds of targets, the commander of Strategic Command has seen the need to be able to hold those risks.

Senator Thune: Okay.

General Shelton: Senator, as we think through the threats to our space systems, some of them are ground based, some of them are space based. But in dealing with the ones that are ground based, our only option right now seems to be a kinetic strike against that ground-based asset that is engaging our space assets.

That leads you down that road of prompt global strike. You also could consider a non-kinetic computer network attack or something like that, if you could get into the network, if they were even reliant upon a network, which is a huge intelligence challenge to start with. But as we think about either reconstituting or augmenting, you have to consider that that threat is still extant and deal with that threat on the ground before you put something into space and put it at risk just like the thing that was just taken out.

So it is a complex problem, and as General Kehler said, dealing with that threat on the ground with some sort of weapon has got to be a priority for us if we are going to consider contested domain as part of a conflict.

Senator Thune: Thank you, all. Thank you, Mr. Chairman.

Senator Bill Nelson: Secretary Payton, are you going to be able to answer his question in classified session?

Mr. Payton: I am not knowledgeable on the details of the NRO spacecraft.

Senator Bill Nelson: Now, your boss would be the assistant Secretary, would he not?

Mr. Payton: I work for Mr. Wynn, Secretary of the Air Force.

Senator Bill Nelson: Right. And the assistant Secretary position is vacant, isn't it?

Mr. Payton: Under Secretary is vacant, yes, sir.

Senator Bill Nelson: Under Secretary. And that is the one that is dual-hatted?

Mr. Payton: Mr. Wynn is—when the Under Secretary job is vacant, Mr. Wynn is dual-hatted.

Senator Bill Nelson: He is also the Secretary of the Air Force and the EA for space?

General Kehler: I think he is talking about NRO.

Mr. Payton: NRO. No, the dual-hatted position for both military space and NRO, that dual-hatted position evaporated 19—I mean, 2005.

Senator Bill Nelson: Okay. So to talk other—to get Senator Thune's question answered, are you saying that there is nobody in your bailiwick, including the Secretary of the Air Force, that can answer that question, that we would have to go to the head of the NRO?

Mr. Payton: That is accurate. Yes, sir.

Senator Bill Nelson: Would the Director of National Intelligence be able to answer the question?

Mr. Payton: If he could not answer it immediately, he could get it for you, to be sure.

Senator Bill Nelson: Okay, and is there anybody in DOD that could get it? Could the Secretary of Defense get it?

Mr. Payton: I could ask the question and run down the answer for you. But again, the spacecraft was an NRO responsibility.

General Kehler: Senator, it isn't about us being able to get the answer. I just wanted to point out to you that those of us sitting at the table don't have the answer.

Senator Bill Nelson: The head of NRO jointly reports to the DNI and the Secretary of Defense.

Mr. Payton: Yes, sir.

Senator Bill Nelson: So we could get it from either one of them. All right. What we need to do is to move quickly to S-407, and we will resume in classified session. And we will submit written questions for the record that we haven't had time to ask here.

[Whereupon, at 3:40 p.m., the hearing was adjourned.]