

Space Command at Twenty Five

General Kevin P. Chilton
Commander, Air Force Space Command

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Moderator: It is indeed my honor today to introduce the next speaker, General Kevin Chilton, known as Chilly. Our speaker this time is the Commander of Air Force Space Command. He's been an astronaut for ten years, he's flown on three space missions. His command responsibilities and other duties have ranged from pilot, came back in the Air Force, pilot, Commander of 8th Air Force, and he's had other senior positions.

Those of you that might know this, Chilly worked for me in the Joint Staff, and if I gave you a list of his responsibilities you'd be blown away. He had responsibility for Afghanistan, Pakistan, India, China, North Korea. And he has the distinction of being put on an airplane to fly to Uzbekistan about four or five days after 9/11 to try to secure basing options there.

He'll talk a little bit and then we'll have time for a few questions before our next session. I'd ask you to come to one of the mikes to ask a question.

Please join me in a warm welcome of General Kevin Chilton.

[Applause].

General Chilton: Thanks, General Dunn. It's great to be introduced by a former boss, and a great one. Those were indeed exciting days on the Joint Staff.

Man, I feel like I'm in church. Empty front rows. Everybody's packed in the back. [Laughter]. It reminds me of a talk I gave recently and I said can everybody in the back hear me? A couple of guys said no. Then three people in the front row got up and moved to the back. [Laughter]. Boy, if that won't set your confidence off high when you're getting ready to speak.

It's a pleasure to be here with you today. I want to thank the AFA for sponsoring this great event. It's great every year. And last night, once again, just stirred the patriotic feelings in everybody's heart who was there, and also pride. Pride of our great Airmen. Being there for the Outstanding Airmen Awards Banquet was just a special moment for me. I hope all of you that made it enjoyed it as well.

What I'd like to do is just take a little bit of time. I'm known for maybe running at the mouth a little bit and talking longer than I'm supposed to, and I know we've got some very

interesting forums that I don't want to cut off so I'll try to go through my remarks quickly and then leave a little time for your questions because for me that's the most fun, is to hear what's on your mind, what you're thinking and maybe give you a little better insight into where I am on a few issues.

Heritage to Horizon, our theme, our anniversary celebration theme. I'd like to kind of leverage a little bit off that and talk a little bit about Air Force in the space domain, our heritage and our horizon there.

Our heritage really goes back to just after World War II, the 1940s. There was great debate in our country as to who would settle on the space mission. Some of our great air leaders of the time period, Hap Arnold and Jimmy Doolittle, said it was a natural fit for the Air Force because we were the leading edge, cutting edge technology service. They spoke vociferously about the Air Force taking on the major leadership role in space.

Fortunately at the end of World War II, because of the kind of country we are, because of the kind of Airmen, Soldiers and Sailors that we are -- which are both people who want to win and will do anything to achieve the goals of the nation, but at the end of the day are also compassionate in victory -- fortunately for that a lot of the German scientists who had been working on rocketry raced to the West when the war ended. Not all of them made it, but they all were headed West because of the freedoms that they saw in the West.

Some of them came to this country and brought the V2 technology with them.

It was always interesting to me when we peeled the skin back on the V2 rocket motor back in the 1940s what we found were Robert Goddard's designs implemented in the German rocket. So we had been out in front but we had been asleep at the switch when it came to rocketry during that time period because Dr. Robert Goddard here in America had really laid the ground work for rocketry.

In the 1940s the debate raged as to which service would lead this effort.

In the 1950s the Air Force looked at this and said you know, there is a synergy between a need that we have for developing a long range strike capability with an intercontinental ballistic missile and access to space. A fellow named General Benny Schriever took a small group of folks out to my home town, Los Angeles, California. Actually it was in the little town of Inglewood. Took over a little schoolhouse, an abandoned schoolhouse there. They dubbed themselves the Schoolhouse Gang, and with the development of the Western Development Division they

set out upon a mission to develop intercontinental ballistic missiles and rocket technology that would enable access to space for the United States.

We were driven to that in those days for two great needs. Reconnaissance, or as we say today global vigilance; and power, global power. At the time we worried about the Soviet bomber threat and we had no insight into it because the Iron Curtain had fallen across Europe. So we needed that global vigilance. We needed eyes over the target to determine the threat. And we were interested in global power, in developing another way, an alternative to just the air breathing methods which we had for our strategic deterrence.

Some marvelous things came out of that effort. The Corona Program in the early 1960s where, talk about persistence. It's hard to imagine this today. Twelve consecutive failures in the Corona Program -- either rockets blowing up on the launch pad, satellites not getting to their proper orbit, reentry capsules landing in the ocean and sinking and not being recovered. Twelve consecutive launch failures in that program and yet we persisted because we knew it was important for the defense of this country.

On the thirteenth flight, the first successful Corona reconnaissance satellite was recovered and then began the era of space reconnaissance in a big way.

Benny Schriever was right. There was synergy there. And as you look at the development of our early ICBMs, the Atlas missile, the Titan missile were the very same missiles which we saw lifting satellites into orbit both for the Corona program, but another set of satellites in which we put human beings in. Both the Mercury and the Gemini Program rode on Air Force rockets that were developed by the United States Air Force, man-rated by the United States Air Force, and flew with 100 percent mission success throughout the 1960s.

Space in the 1960s, we were still doing reconnaissance, we were still developing the Minuteman III, but I think we'd all have to agree that a battle of ideology was being fought and a battle was won in the 1960s in space. Our United States Air Force was a big part of that. And of course that was the race to the moon.

I'm so proud of this country. I'm proud not only that we were successful in that endeavor, but the way we did it. I've talked to some of my NASA colleagues who were there and part of the Mercury program. They'll tell you when they were told that on Alan Sheppard's first flight it was going to be broadcast on live national television, they said it was like ice water had been poured into their veins. The whole world was going to watch whether they succeeded or failed. When you compare that to the

Soviet approach where it was hidden from view until, and only good news was reported to the globe.

It was an ideological difference. It was a free and open society versus a closed society. That was a battle fought and won on the frontiers of space and our United States Air Force was a part of that.

The 1970s we started seeing our fielding of other key aspects of global reach, vigilance and power. In the vigilance area, the DSP satellite program became an integral part of our strategic deterrence in that we were able to observe and surveil the earth for missile launches anywhere around the world.

The [Discus] satellite constellation was developed for global communications to allow us to communicate with our forces anywhere on the planet, whether they be airborne, at sea, or on land. And global power. Some people had some ideas that actually began back in the '50s and started to coalesce in the 1970s about putting a satellite constellation up in space that could tell you where you were on the planet. Some kind of navigation system that just might be useful, which later became known as GPS.

The 1980s was a revolutionary time for space in our United States Air Force. In 1982 Air Force Space Command stood up I guess with the reorganization of our Air Force in '91 that makes us kind of one of the oldest commands that are out there, which is kind of ironic since we're in one of the newer fields of endeavor.

But in 1982 the Air Force decided to, some would say, operationalize space. I would not. I would say normalize space. Normalize the way we organize to do space in our Air Force.

It would be an insult, I think, to say that we were not operational before that when you look at the great things that have been done in the 1950s and 1960s and particularly in the development of the Corona program. Launching a rocket on time and to the right plane, the right lighting conditions to take photographs of the earth, the orbital capsule to be caught by a C-130 off the coast of Hawaii, you've got to be a little operationally focused to make that happen, and those people were. But we weren't normal. We didn't fit the construct and the organizational construct of our United States Air Force and so in 1982 a great move was made by then Chief Allen and our first Commander, General Hardinger, to stand up Air Force Space Command.

It was the beginning of a forced marriage, if you will, in my mind between our expertise in the air domain and the expertise in the space domain. I would say before that it was those space

guys out there on the West Coast and the rest of the Air Force. This now provided us an opportunity to truly become integrated in the way we delivered global reach, global power, and global vigilance to the fight. So much so in 1991 in Desert Storm, people dubbed that the first space war. It was the first time where you started to see the effects of space in combat. GPS was just beginning to be used. We didn't have the full constellation up, but we had receivers in the field we were beginning to use.

I can remember General Harry Radigee telling me, he was the 6 for CENTCOM at the start of that fight. He said we had less than one T-1 worth of com coming into that AOR as we were going into that fight, so we had to rely on satellite communications, we had to adjust our constellations. We adjusted the DSP constellation and that to move away from not only providing strategic missile warning, but warning of SCUD missile attack.

Some great strikes were made in 1991, yet at the end of that war the CFACC, General Horner, complained about the lack of air and space integration. We still weren't there. It still wasn't where he knew we could get to and needed to go to. So what did we do? We said okay, smart guy. You're now the Commander of Air Force Space Command. I don't know if General Horner is here today, I'm sure the first words he said was I don't know anything space. The answer was, perfect. Get out there and figure out a way to bring these two communities together. It wasn't a space problem and it wasn't an air problem, it was an Air Force problem on how we could bring these two levels of expertise together and bring synergy across both domains.

I would argue that the 1990s was a revolutionary decade in our United States Air Force for the integration of air and space power. We go from '91 where it's just starting to be used to what you see in Bosnia and Kosovo and at the end of the decade. JDAMs being delivered, U-2s on station sending data through satellites back to California and in almost near real time targeting coordinates back to airborne airplanes overseas, all enabled by satellite communication.

All of that happened in the decade of the '90s and it happened because we jammed folks together in the same room and said let's think about how we can do this better. Let's learn each other's business. That is the beauty, in my view, and the power of Air Force Space Command being in the United States Air Force, and I believe that's where it should be today and where it belongs for the immediate future.

We bring great synergy to the fight. We think differently as Airmen. We think three dimensionally. We think in a technological regime that we are comfortable operating in. We're not afraid to ask why, we're not afraid to try something differently. And when you have assets and expertise in space and

air and you bring those together with that kind of philosophy and that kind of approach to problem solving, and/or warfighting, you get something pretty special and that's our United States Air Force today.

As we look to the future, our horizon, enough about our heritage, looking to the horizon on the future, I see a very bright future for us. I see us moving out even to new heights in the future. Let me just talk a little bit about some of the things we're doing in Air Force Space Command to advance the technology and the art of what we bring to the fight day in and day out.

Wideband global satellite system is about ready to launch this fall. This single satellite, the first of five in the constellation we'll put up, will have more bandwidth than the entire [Discus] constellation that's up today -- one satellite. And we're going to put up a whole constellation of them.

AEHF, Advanced EHF satellite will replace our current MILSTAR satellite on orbit. Ten times the capability of that and it's just the satellite and the on-deck circle, although it will revolutionize the way we do global communications. Following on its tail and being developed right now is the TSAT satellite which will take us another ten times, or 100 times improvement over our current bandwidth today.

GPS III will bring improved accuracy over what we have today in our constellation. It will bring improved anti-jam capability. And it will allow us to have a more flexible and responsive constellation, and we absolutely need to move on to that. The RFP for that was just let a couple of months ago.

So we've got a lot of things rolling down the road in communications and in navigation, in warning. The DSP constellation will be replaced by SBIRS. The first sensor is on orbit right now in a highly elliptical orbit, and I've seen the data from it. I've seen what I would call the images from it. And it is going to be, in my view, as revolutionary as GPS was to the fight today.

When we brought GPS on board we weren't thinking about JDAMS. We were thinking about something that could update my map. Now it's precision timing. It's in our financial systems. It's in our logistics systems. It's in every aircraft communication system. It synchronizes our operations. It enables our JDAM munitions and it does so much more, we've become so dependent on this system. I predict SBIRS when it's fielded, we're going to start figuring out new and different ways to surveil the battlefield with that and integrate effects as a result of that.

Of course let's not forget the back stop of America, as Chief Moseley calls it, our ICBM force. We are in the process of finishing a complete recapitalization of the Minuteman III. New rocket motors, upgraded guidance system, new reentry vehicle. Nose cone to rocket engine, it's a brand new deterrent force in place in our missile fields today that will last well into the 2020s.

A bright future ahead of us.

Just as 50 years ago, though, this year the world was shocked by the launch of Sputnik, and we were surprised by that. Fifty years later, ironically, from then to today we had another event 50 years later that shocked and got our attention. Sputnik got our attention with regard to the potential for exploiting space and intercontinental ballistic missiles. The event that happened this year that got our attention was the Chinese ASAT test. A lot of folks always assumed that space was a sanctuary. Those in the business never felt that way, and they understood and clearly understood as we became more dependent on the capabilities that we brought from space adversaries would seek to take away that asymmetric advantage that we have.

Well this year on the 50th Anniversary of Sputnik, we had another significant emotional event when the Chinese demonstrated that indeed what we knew, space is not a sanctuary. So what does that mean for us today? We are challenged, we have been challenged in the past, and now we know clearly where we need to invest our next dollars in the space domain. We need to improve our situational awareness in that domain.

The first principles of any combatant commander, of any operator that's going to operate on land, on the surface of the sea, underwater and in air, the first thing that commander wants is a picture of the domain they're going to operate in. Where's blue, where's red, where's gray, where are they going, what are their capabilities, what are their intentions? We need this exact same thing for the space domain today and we do not have what we need for tomorrow.

We have today a Cold War architecture which was reduced in scale in the 1990s to help pay the peace dividend. So we're less capable today than we were in 1989. And in 1989 we only worried about the Soviets. Today there are eight nations in this world that can launch rockets into space. There are multiple nations that either are part of consortiums or own and operate satellites in space.

We need to understand what's going on in that domain. We need new sensors -- ground based and space based, and I'm happy to talk about our Space Based Space Surveillance System that is on track to be launched in '09, is going to be part of that

architecture. But it's vitally important in my view that we make the appropriate investments in sensors.

We also need to make investments in how we present that data to the combatant. The commander. General Willy Shelton out at the 614th AOC, the JSPOC in Vandenberg, California, we just cut the ribbon on the new building on Friday. It's a spectacular upgrade out there to a capability that we desperately need. He needs to have the ability to get a picture in his combatant commander's headquarters there that describes that domain to him as good as our AOCs have for the air domain today, as good as our CAOCs have today. We need to make investments to make sure he has that.

Finally, we need to make investments to make sure that General Shelton has the ability in his support of the STRATCOM Commander to command and control the forces under him. Today he uses PowerPoint. Today he uses Excel. We know there's a better way to do that. We've demonstrated that in our AOCs and our CAOCs around the world, and our Falconers. We need to make that same investment and commitment to our AOC at the 614th AOC that is commanding and controlling and directing a force that is not there just to support the United States Air Force. In fact nothing we do out there is just for the United States Air Force. It is for the joint fight.

General Shelton is not only supporting the STRATCOM Commander, he is supporting every regional combatant commander around the world to make them more powerful and more successful in their missions.

Lastly, the other area I think we need to keep our eye on the ball on is our launch infrastructure. None of this happens without assured access to space and that starts with being able to bang rockets off launch pads in Vandenberg Air Force Base, California or out of Cape Canaveral in Florida. We put those ranges in place a long time ago. We've kept them up to a point where they can continue to do their mission today, but they're past time to be brought into the 21st Century in the capability and the way we run those ranges and they are a national treasure that deserve and warrant appropriate investment for the future.

Heritage to Horizon. We have a great heritage in this United States Air Force dating back to the Wright Brothers, through the Army Air Corps, through the great times and tribulations of the last century. The same is true for our activities in the space domain as are in the air domain, and now cyber is in front of us as well. It is clear, I think, that the two asymmetric domains that will be most significant in this coming century will be both in cyber and space. I'm proud to be a part of the United States Air Force that appreciates that, understands that, is willing to make the investments in it not

only in equipment but in the human capital which is all important to our success in the future.

Thank you very much. I appreciate the opportunity to talk to you and I look forward to your questions.

[Applause].

Moderator: Thank you, General Shelton. As the Chair, give me the opportunity to ask the first question.

Space is getting crowded right now. What kind of concerns do you have with dust and other debris and old systems and especially with the increased number of countries that are launching systems up there? Is there a coordination mechanism that we've got?

General Chilton: It is getting crowded up there, but it's a big place. We all know, those who have flown in the air domain, we've talked about the big sky theory. It's a big, bigger space theory. That said, a couple of examples.

On every one of my three space shuttle flights, on return we had to replace windows on the space shuttle's outer panels because they had been damaged by classically small debris, paint-fleck sized debris from manmade satellites put in orbit. You only have to run into something about the size of a ball point pen, something about this size, going at 25,000 feet per second -- opposite vector if 50,000 feet per second -- and you can destroy a space vehicle up there. So you have to worry about this.

You have to worry about how small can I track? How small of an object can I track? How well am I prepared to keep custody of that and understand where it is and predict where it's going to be in the future so I can coordinate and deconflict launch operations and on-orbit operations, particularly in the low earth orbiting areas.

As you move further away, space gets bigger. The area to operate in gets bigger as you move out on the circle, but where are all our key communication satellites and everyone else's out there, geosynchronous orbit.

We have some international rules about you can have this slot and you can have that slot. How well people stay in those slots is better for some cases, not as good in others.

At the end of the day, though, what we need to be able to do Mike, is we need to be able to know where everything is up there.

What I worry about from a military perspective, the intentions of the satellite owner and operator. Has it

maneuvered? If so, why? What's its capability? That's as important to me as keeping track of all the debris and all the manmade stuff and the natural stuff, is what is the intentions and capabilities of the systems that are up there? That gets back to doing not only surveillance but reconnaissance of space. That is equally important, I think.

Question: There have been some space leadership summits lately to talk about the ASAT and what you might do to protect the constellation. Can you tell us some of the things you might be able to do for satellites, such as armoring or hardening? Or whether it seems like the thing to do is to migrate some of the functions in space back down to an air-breathing system, some of the ISR function?

General Chilton: First of all, the immediate reaction after the test is we've got to do something now. I think the immediate reaction was to focus on the satellite side of the equation. I'd say a couple of things.

First, it's not an easy problem and it's not one warranting a snap decision because there are various ways to address this problem. You pointed out one. Migrate the capability to an alternate way of getting it. That can be a deterrent in and of itself. If you can look someone in the eye and say you know, you can go after my satellites but in the joint area of operations I'm still going to win. In fact I'm not only going to win, I'm going to win decisively because I have alternative means to provide those capabilities. That in itself can be a deterrent for someone going out to invest their national capital to develop a system capable enough to go up after your satellite systems.

Self defense is something that people have talked about for years to be putting on our satellites, but no one has been interested in it because it's extra weight, you're trading off sensor payload to do that, and where's the threat?

Well, we've got the answer to that question. The threat exists.

So you need to think about requirements for future satellite designs on what you're going to put, how you're going to balance on-board defenses, off-board defenses, alternative methods of delivering the capability.

Then we want to have all the arrows in our quiver as a country, and that's not just military solutions. Diplomatic. One of the key things I think that's important about space surveillance and situational awareness is attribution. And understanding of what's gone wrong with your satellite. If a satellite stops working up there you need to know was that caused by environment? Was that a sunspot? Was that a solar event?

Was that cosmic rays that caused the computer to shut down? Or is someone messing with my satellite? And if someone's messing with my satellite, who?

Imagine if the Chinese test, if we hadn't known who had done it, if we didn't have the sensors in place to attribute it to them. None of the thing we've been able to do as a nation, which have been mostly diplomatic and international pressure to knock it off, could be brought to bear without attribution, and attribution is absolutely key.

Finally, I'd circle back to my point about overly focusing on the satellite. To deliver a capability from space you've got to have a ground station, you've got to have a link going up to command and control a satellite, you've got to have the satellite on orbit, and you've got to have a link coming down delivering the information or whatever it is you need from that capability that satellite is delivering.

You have to concern yourselves with the vulnerability of all parts of the equation, not just the satellite. And when you look about an adversary's ability to go after your satellites, we need to look at the infrastructure they require to accomplish that mission. And it's not just a rocket and an anti-satellite weapon. There are kinetic and non-kinetic answers to this problem as well, I'm convinced.

So I don't have the exact answer for you, Jon, I'm just saying there's a panoply of things we need to study and balance in the trade space.

Question: Two questions for you, sir. The first question is do you see Space Force down the road becoming a separate service? And the second question is with Minuteman III life extension to 2025, what do you envision as the follow-on replacement? And where do we stand with acquiring that?

General Chilton: I think I heard them both there. Do I envision a separate Space service? No. I think today, no. Absolutely no, I'd say. That was kind of my point about the synergy in my remarks. I think we are better as a combined force now. I think the Air Force dominance of air and space and in the future cyber as we mature into that has great synergy today.

I used to in a simplistic manner think, and it may not be wrong yet but I haven't thought much about it lately, that until you can get to a point where you can kill something in space from the ground, kill something on the ground from space, and kill something in space from space -- in other words you have an independent effect you can bring to the battlefield like we determined the air power could do in World War II, an independent strategic effect that you can bring, that maybe then you start

thinking about organizing differently. But right now our key contribution is in enabling other forces. I think that's where we need to be right now.

On the ICBM question, our investment in Minuteman III and particularly in having enough test assets to take us into we think 2030 and sustaining that fleet, means it buys us time to look at the strategic environment of the world over the next ten years and determine exactly what we need for a land-based follow-on to the Minuteman III.

The first question is, do you need that? Is that going to be part of our strategic deterrent posture in the future? I predict it will. That's my sense.

Next is how many and what performance and what size and where do you want to station them, et cetera, et cetera. Those questions need to be asked and answered and we have a good time period here. And as things evolve in this century, as the international environment evolve, we'll be able to be better postured to make that decision, and we don't have to make it next year, but because of our upgrade we've probably got until about the 2015s, 2018s to start closing on those questions to decide how we're going to field the follow-on to the Minuteman III.

Question: I was wondering, a lot of people mention the term defensive counter-space when they're talking about space issues and the threat of ASATs. I was wondering if you could kind of, what does that term sort of mean to you? How would you define it?

Second of all, I was wondering if you feel like the ASAT test kind of opens up a need to have a more vigorous debate about the need for kinetic space capabilities to defend our satellites?

General Chilton: The President's policy I think is right on. We want to have the ability to operate peacefully in space. We believe all nations should have the ability to operate freely and peacefully in space. At the same time the United States of America should never give up its own right of self defense. So when we think of defensive counter-space we think of our right to defend our assets in space should they come under attack.

Your second question was --

Question: Whether you think there should be a more vigorous debate about the need for kinetic weapons.

General Chilton: I'll tell you what I'm not a fan of. I'm not a fan of creating space debris. I think what the Chinese did was irresponsible. I thought it was chutzpa for them to turn around then and ask to participate in the International Space

Station Program where we put human beings up in an environment that just created somewhere between two and 20,000 pieces of debris that can put those people at risk.

So we never say never on ruling out options for doing things, but me personally, I'm not a fan of creating large debris clouds.

Imagine if we multiple that times 10, 20 or 30 in an exchange, if you can imagine an exchange like that, what that would do to our ability to launch, to operate in low earth orbit, for nations to operate in low earth orbit. And it's not just military that's up there. It's commercial as well.

I think you have to think carefully through the options that you would consider for the future, and I'm personally not a fan of kinetically creating a lot of debris.

Question: Secretary Wynne has said that we're looking at needing to completely recapitalize space in the next 12 years, which seems a very short time for the amount of satellites that we have up there. I'm wondering, is that an actual doable thing? Can we do this in a dozen years with the budget constraints that we have now? And also are our technologies mature enough even if we have the money to do it in that kind of time?

General Chilton: The answer is we are doing it. If we get stable support in the budgets that we have proposed, in the President's budget this year and next year, we will do it. GPS III, we have the money laid into the program to do it. SBIRS, the money is laid into the program to do it. WGS, it's laid in. AEHF, it's laid in. EELV, our new launch systems, is laid in. So we need to stay the course right now. As we do that we will see a recapitalization program that is very healthy.

Space, unlike in our air domain where we have absolutely serious problems as the Chief and the Secretary have talked about over and over again, and I couldn't agree more with, with our aging aircraft fleet, space has a unique advantage. We have no depots. You can't bring them back, scrape the rust off, and send them back up there. We understand clearly now, having been through a couple of cycles of this and now having become dependent on these systems, that we do not desire, nor does anybody -- the Army, the Navy, the Marine Corps, Coast Guard, or civil -- want a break in service from any of the great services we provide whether they be GPS communications, weather, missile warning, that our Air Force provides.

If you're going to have that commitment to no break in service, then you have to recapitalize on a regular interval. That's the way it's going to be for a long time to come.

I think people get that now. The debates now are is the technology mature enough and are the dollars better spent in other programs? I think the dollars that we have laid in right now in the President's budget are the right investments for the future for America in space.

Question: Should Air Force Space Command pursue options in what was once called near space for high altitude, long loiter vehicles?

General Chilton: General Keys and I came to an agreement on this. I do Kepler, he does Bernuli. Now shortly after we had that handshake and looked at how we'd do that, he called me back and he said you know, we didn't talk about Boyle. Of course he's the guy who does balloons and expansion of gases.

I take it back to a core competency area and where your expertise is. In the air domain, the expertise, core competency is in our Air Force, in AMC and ACC and I think that's where high altitude ops should be. I don't call it near space. It ain't near space at all. It's about a fourth of the way there. So that's kind of what we divided up.

So I see a good potential for high altitude operations and exploiting the high altitude domain part of the air domain. And I'm proud of what Air Force Space Command has done to push forward some of those thoughts and experiments, JFX in particular. But I think they're better suited to be in Air Combat Command, and then we need to take care of the stuff where it's really, really, really hard to breathe and you've got to be going really fast to stay up there.

Question: The dependence of the military on space is quite significant and I think that can be reflected in the commercial sector as well. What if anything has Air Force Space Command done to bridge that gap of protecting the civilian sector as well in space?

General Chilton: I think it starts, and we're getting ready to start, what have we done? We're getting ready to go here. That's why I'm talking about space situational awareness and the needs for investment. We started investments in space situational awareness in the '08 budget. We laid in a line to first say what data are we getting in today? We're getting a lot of data in, we're just not fusing it. We're not looking at it in a holistic manner. A lot of it is set up on ITWAA architectures that aren't as timely as we need for the dynamic environment as we go into the future, and we can't fuse the data. So let's take the data we have today, let's make some investments starting in the '08 budget, across the FYDP that improves our ability to display information and give the commander tools to see in a better way what we already are collecting today. But more than

that, we need to improve the sensor suite for the future. We need to improve the lay-down of that sensor suite around the world.

Right now if you look at our sensors they're focused for a Soviet threat, something coming over the Pole. The majority. We need to expand our surveillance of space and that is not only something we do for the military, it's something we will need to do for the civilian sector as well. They're equally concerned about debris. They're equally concerned about conflict resolution on orbit. They're equally concerned about what's out there. So it's important that we move the ball forward I think in this area. We're already started. The big thing is coming I think in the '10 POM and we need to look to the future and make sure we're making the right incremental investments as we go forward.

Mike thanks. Thank you all.

[Applause].

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