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P R O C E E D I N G S

PANEL 1

SHOULD THE U.S. MILITARY EXPAND ITS ROLE IN SPACE?

MODERATOR:

WILLIAM NISKANEN, CHAIRMAN,

CATO INSTITUTE

DR. NISKANEN: Good morning, and welcome to the Cato Institute. I'm Bill Niskanen, the Chairman of Cato.

The topic of our first panel is: Should the U.S. Military Expand -- "expand" is the key word -- Expand Its Role in Space? And our first speaker is John Pike. John is Director of Globalsecurity.org. In 1983, Mr. Pike established the Space Policy Working Group, composed of congressional staff and advocacy organizations concerned with missile defense issues. Ten years later he set up the Military Spending Group, composed of public interest organizations working on alternative energy strategies. He has also been at the forefront of utilizing satellite imagery to monitor worldwide weapon facilities.

John.

JOHN PIKE, DIRECTOR,

GLOBALSECURITY.ORG

MR. PIKE: Space is different. Space is very different. And all else is commentary.

We're going to be hearing an awful lot about military utilization of space today, this year, and certainly through the next presidential election. We're also going to be hearing a lot about missile defense. We've been hearing a lot about it for a long time; we will probably be hearing a lot about it for a long time to come. Hopefully we are not going to hear very much about missile defense over the next 90 minutes or so, because I think there are a lot of other much more interesting topics to talk about in military space activities beyond simply missile defense.

The topic that we are presented with right now, "Should the United States military expand its operations in space?" on some level I think, unavoidably, the answer has to be yes, as in, how could we expect the Department of Defense to tie its hands behind its back at a time when every other sector of American society, every other sector of global society, is increasingly using space systems to support activities here on earth?

Embedded, however, in that question, "Should the U.S. military expands its activities in space?" is I think unavoidably

a topic that hopefully we are going to be discussing today, whether the United States military should fundamentally transform its operations in space and introduce space-based systems capable of targeting other systems in space, transatmospheric vehicles for conducting operations against targets on the ground, ground-based systems for conducting operations against objectives in space.

That is to say, should we transform America's military role in space from what has been called the militarization of space -- which has been an accomplished fact for the last four decades -- to the weaponization of space -- which is something that, despite continuing efforts over the last four decades, is something that hasn't happened? And it's this latter point that I would like to focus on this morning and, unavoidably, we are going to be focused on over the next several years.

And I will return to my original observation: Space is different. You can see this difference as soon as you walk into the Air and Space Museum. Because it is, after all, the Air and Space Museum. It's not the Aerospace Museum. When you walk in off of Independence Avenue, you can either turn to the left and look at the airplanes or you can turn to the right and look at the spacecraft. And you very quickly know which way you have gone, because the airplanes and the spacecraft look very, very different.

The airplanes generally have wings on them. The spacecraft generally tend not to have wings on them. The aircraft generally tend to be nice and sleek and aerodynamic and the spacecraft -- notably, one of the most successful spacecraft in human history, the Lunar Module, is the antithesis of sleek and streamlined. Maybe Mother Nature is trying to tell us something -- that air and space are different.

Well, the Air Force, for over four decades now, has had a different view. The Air Force's primary doctrine is one of aerospace power, flowing from the premise that air and space are a single indivisible operational media and that all of the tenets of air power developed following the first World War are generally applicable to space power, as well, if we could just eventually get around to it.

Now, this proposition that air and space are a single indivisible medium did not spontaneously arise with the Air Force under the Eisenhower administration but, oddly enough, has a very long and distinguished pedigree, going back to the very beginning of the Space Age at the beginning of the 20th century. Because one of the fundamental questions that the early pioneers of space flight had to come to grips with was the question of: Will space flight be evolutionary or revolutionary? That is to say, will space flight inexorably arise from the progressive development of aircraft or will space flight unavoidably mark a fundamental

departure from aeronautics and introduce something fundamentally different from that which had gone before?

And so if you go back and look at sort of the early sketches of what spaceships were going to look like, particularly if you look at some of the early, what we would call today, mission architecture planning and program planning, to try to understand how we would get from the little flimsy biplanes of the 1920's to spacecraft capable of spanning the solar system, the general assumption was that space flight would inexorably evolve from aeronautics, and that the planes would just keep getting faster and faster and the nose would keep getting pointier and pointier and the wings would keep getting shorter; and that eventually, through several stages of evolution, we would get rocket planes which could fly across a continent, and then across an ocean, and eventually get into orbit, and that space flight would emerge as the natural evolution of aeronautics.

And so, during the second World War, when German rocket scientists were trying to figure out how to help win the war, Sanger came up with his famous antipodal bomber, which was a rocket-powered airplane that was going to bounce off the top of the atmosphere, bomb New York, circle once around and land. The antipodal bomber did not get built. Werner von Braun, who aimed for the moon and hit London, was able to build his rocket ship,

which didn't look anything like an airplane. And certainly when Sergei Korolev put the first Sputnik up, this thing is a big beach ball that doesn't look anything like an airplane. Or when Yuri Gagarin goes up, he goes up in a much bigger beach ball that doesn't look anything like an airplane.

And ever since, the most successful spacecraft have been the ones that have looked least like airplanes; and the spacecraft that have looked most like airplanes, such as, regrettably, the Space Shuttle, have turned out to be among the least successful spacecraft.

Hope springs eternal, however. And for the last four decades, the Air Force has continued to insist that every mission category -- air-to-air, air-to-ground, close air support -- that all of the functional categories that have been involved for aircraft are going to find their corresponding expression in space flight. Unfortunately, for the last four decades, all of those categories in the space half of aerospace have essentially remained empty. And I would submit that maybe Mother Nature is trying to tell us something.

In particular, why haven't some of those categories been populated? In particular, for instance, why does the United States not have a robust explicit anti-satellite capability today? Well, let's go back and review the bidding to understand

why it is that we have developed anti-satellite capabilities in the past. They were in response to very specific threats.

In the 1960's, the United States was concerned that the Soviet Union might put nuclear weapons in orbit, and we developed two nuclear-tipped anti-satellite weapons to shoot them down. By the time it became clear that that almost certainly wasn't going to happen, and after one of the ASAT systems got washed away in a typhoon, the United States decided that this probably wasn't worth fooling with.

In the late 1970's, there was growing concern on the part of the Carter administration about the possibility that the Soviet Union would use its satellites to be able to target our aircraft carriers. Consequently, they embarked on the development of an air-launched miniature vehicle ASAT that was tested one time in the 1980's. Subsequently, that program was cancelled.

After that, we fought two space wars. We fought a space war in Desert Storm against Iraq. We fought a space war against Serbia during Operation Allied Force. Was there anything about those two space wars that would have been enhanced if the United States had had an anti-satellite capability? Was the great shortcoming of America's military space systems during those two space wars that we could not shoot at all of those Iraqi satellites? Or that our forces in Italy were being

relentlessly targeted by Serbian reconnaissance satellites? Well, of course not, because neither Iraq nor Serbia had any satellites for us to shoot at.

I would say that, to the contrary, the fact that the Gulf War and the Kosovo War were so singularly and spectacularly successful, that the casualty ratios were simply without precedent in six millennia of human history, shows the benefits of military space systems to support operations here on earth, and suggests that the debate about the United States acquiring an ability to target the satellites of other countries is, I would say, at best, misguided and, at worse, leading us in the wrong direction because we're going to wind up talking about the wrong things.

Does the United States have an ASAT capability today? Unavoidably, we do. A small number of satellites in low-earth orbit are unavoidably vulnerable. The United States has several different capabilities that could take out one or two such satellites. And I would say that for a big, rich, powerful country like the United States, there is probably almost nothing we could do to get rid of that capability.

On the other hand, does the United States have a current requirement for a robust sky-sweeping capability that would enable us to destroy dozens of satellites in an afternoon? I would say that, unfortunately for the advocates of

anti-satellite weapons today and for the foreseeable future, there is simply nothing up there for us to shoot at.

Well, there may be nothing up there for us to shoot at, but there are obviously things up there for the bad guys to shoot at. We've got about half a dozen very important, very expensive, very difficult to replace imagery intelligence satellites in low-earth orbit. And I would submit that those satellites are some non-trivial fraction of the reason that the United States today is a superpower and no other country is. And other countries, looking at those capabilities, would have to understand that that is a singular vulnerability of ours.

We need to do what we need to do in order to protect those satellites. We probably need more of them. We probably need to move them to higher orbits. I would also submit that it is in our narrow military interest to stigmatize attacks on those satellites as being the moral equivalent of attacks on hospital ships, to make it very clear that any country that thought about attacking those satellites would therefore provoke a retaliation from the United States that would be so grievous that they would not care to contemplate it.

Well, what else do we need to do to improve the security of our military space systems? Unfortunately, it's not the satellites that are the most vulnerable part. Unfortunately, it's the ground stations that continue to be the most vulnerable

part. While we have half a dozen imagery intelligence satellites orbiting many hundreds of miles above the earth's surface, we have only three primary ground stations that are responsible for operating those satellites, one of which is less than 10 miles from where we're sitting right now. And that satellite ground station is so important that it is known, I gather, as simply "the ground station." That satellite station is easily within mortar range of a variety of public access areas, as are the other two ground stations in Hawaii and the United Kingdom.

If you want to ask, what could the North Koreans most readily do to attack our military space systems, it would basically be to send commando teams to these neighborhoods with mortars and launch a five-minute mortar attack on those ground stations. It's a lot easier for them to do that than to attack our satellites directly.

Now, what is an American anti-satellite capability going to do if the North Koreans have no satellites for us to attack and they are attacking our space systems on the ground, at the ground stations, where they are most vulnerable and where we are currently doing the least to protect them? Nothing.

Where should America's military force be going in space in the future? Frankly, I think that the most urgent priority is to get space forces out of the Air Force, get them out of the Army, get them out of the Navy, and set up a completely separate

Space Force. This would enable space forces to concentrate on what they do best -- dominate battle space awareness, assuring information superiority, supporting combatant forces here on earth, and free them from the misguided tenets of aerospace power doctrine and free them from having to concentrate on these essentially irrelevant things, like anti-satellite weapons, and enable them to concentrate on the things that are most important -- making sure that our forces win wars here on earth.

And why haven't we done that? Why has the Air Force persisted in aerospace power doctrine for nearly four decades now? Well, it's incredibly obvious, isn't it, Mandrake? They pulled that stunt on the Army not too many years ago. They've seen this movie before. They know how it ends.

They started developing air power doctrine in the 1930's, made it clear that air power was different from land power, and so we had to set up a separate Army Air Corps. And the triumph of air power during World War II made it clear that we needed not simply a separate Army Air Corps but a separate Air Force. The Air Force understands very clearly how development of doctrine precedes and lays the foundation for the development of organization. Air Force aerospace power doctrine is intended to keep the space mission in the Air Force and to prevent the space cadets from setting up their own shop separately.

My own view is that we've managed to survive with this simply due to the fact that the United States is very large and very powerful and our adversaries are increasingly weak. But if we were to look at this matter rationally, we would understand that if we have an Army to deal with the ground and a Navy to deal with the water and a Marine Corps to deal with the soggy stuff in between, if we have a separate Marine Corps devoted just to dealing with beaches, then surely when you contemplate space, which is completely different from all of those other physical media, which has essentially nothing in common with those other physical media in terms of what you can do best there, then surely the sooner we set up a separate Space Corps, with its own promotion track, with its own acquisition budget, bringing together those space units that don't even have space in their name over in the Army and the Navy, which, after all, are the big users of space -- not the Air Force -- the sooner we set up the separate Space Corps I think the sooner that America's military space policy is going to be set on the right track.

DR. NISKANEN: Thank you, John.

Our second speaker is Peter Huessy. Peter is President of PRH & Company, and he is a Senior Associate at the National Defense University. He specializes in the legislative and congressional aspects of U.S. defense and military policy and, particularly, Mr. Huessy works in the areas of missile defense,

space, strategic bombers, tactical aircraft, and nuclear weapons policy.

Peter.

PETER HUESSY,

NATIONAL DEFENSE UNIVERSITY FOUNDATION

MR. HUESSY: I want to first thank Ivan Eland and Cato for asking me to appear here today.

And I would like to start off and talk to you about four things. Often when we talk about technology, either in or through space, we assume that it will generate an arms race of countertechnology and therefore it's not worth the candle. Second, what is often not talked about is the use of space and space assets in a counterproliferation role, and particularly stopping the deployment and potential use of weapons of mass destruction. Third, I would like to talk about a real-life situation, which we examined at the National Defense University this spring in a conference on just this subject. And, fourthly, what kind of things are in the budget, or could be in the defense authorization bill, that might address some of the questions that some of you may have about the use of space and the protection of our space assets.

In the 1930's, Winston Churchill argued that the deployment of radar along Britain's coastal regions, though not a perfect warning system for bombers, and certainly not going to protect against the bombers themselves, would help a great deal in defending Britain. Interestingly, historians that have written about the Battle of Britain credit radar with turning the tide. Many people said at the time that building radar in Britain would push Britain's adversaries to build more bombers. You may find that argument familiar with what you hear today.

In the 1930's, there was an effort to outlaw submarines from firing their weapons underwater. The argument was that submarines should be scout submarines for battleships and aircraft carriers and fleets, and therefore we had to go and rebuild them all at a much faster speed and then they could surface and fire their weapons, but not underwater. And then of course the Navy declared Pearl Harbor a sanctuary from attack because it was assumed that the Japanese could not build torpedoes that were capable of descending from an airplane, hitting the water, and becoming buoyant quickly, because Pearl Harbor is a very shallow harbor. Those tricky Japanese in fact did build torpedoes, and those torpedoes of course led to what we know as the Day of Infamy.

Now, all these illustrate a common theme; and that is that people would like to stop technology, particularly military

technology, from being used. And we sign treaties with adversaries who must give us permission for us to deploy something, and we must trust our adversaries not to deploy something. Remember, war itself was outlawed. Hitler got around the battleship restrictions by not counting the weight of the guns and supplies on a battleship and got around the weight restrictions.

So, that comes to the point of if our space assets are a singular point of vulnerability -- and I agree with John that they are -- then not protecting our space assets -- notice I did not talk about attacking other space assets -- not protecting our space assets and making them more redundant would be equivalent to a Pearl Harbor defense of our space systems.

Let's go to the issue of, where could space be most helpful? One of the results of the Gulf War, the culmination of 12 to 15 years of technological development within the Pentagon, was what was called the Revolution in Military Affairs. And the Gulf War demonstrated this in no uncertain terms to the enemies of the United States, whether Saddam Hussein or Kim Jung-Il. And what it demonstrated is, don't fight the United States in a traditional conventional sense, tank on tank, artillery piece on artillery piece, but use either ballistic missiles or weapons of mass destruction. As the Indian Defense Minister told the late Les Aspin, former Chairman of the House Armed Services Committee,

and former Defense Secretary, the lesson of the Gulf War was, don't fight the United States unless you have two things: ballistic missiles and weapons of mass destruction.

One of the things that we looked at in the conference at the National Defense University in the spring was this question of finding and targeting weapons of mass destruction, particularly those that are in hardened, deeply buried target complexes. Remember, during the Libyan crisis, Secretary of Defense Perry was asked, "Can you target those Libyan chemical weapons facilities that were deeply buried?" And I think in a slip he said, "No, we can't, except for the use of nuclear weapons." The next day that was clarified to say he didn't mean it. But he did not say what it was we could use to go after those complexes.

It's often assumed in the popular press that Tomahawks, for example, cruise missiles, can do this. A Tomahawk cruise missile cannot go down a chimney. I use the analysis: It can't go after deeply buried, hardened targets. It can go through a door, it can go through a window -- it can do that at relatively pinpoint accuracy -- but it does not have the capability of going through to deeply buried, hardened targets. In fact, if you look through Pentagon need mission statements and requirements, this need to go after weapons of mass destruction that are deeply buried is the singular unmet need in the U.S. military today. We

need it. Every document that I've read in this business says you need it.

Now, what could you do with that? You also have mobile targets. That's another thing. We found in the SCUD war in the Gulf, we did not take out a single SCUD mobile battery. One of the reasons is by the time our surveillance folks could find out where it was and get that information back to the warfighter and then the pilot, the mobile system, the SCUD, had moved. So, one of the things you might look at is, in eight out of the last annual reports to Congress, the question of using space for long-range precision strike capability. And what that means is you don't base something in space, you can base it in the United States on the ground, you could base it in a ship. The question is, do you use space to send something through, just like we do with the ballistic missile in the event of, God forbid, a nuclear war. We have always said, where do ballistic missiles fly, they fly through space.

Now, the question is, one of the keys here is that you don't always have access to the littoral region of a nation, near the shoreline. You have sea mines, you have overflight questions, you have SAM batteries, surface-to-air missile protections of these sites, and time to target urgency is critical. And that brings me to this question of, in 1998, finally there was a hearing before the Senate Armed Services

Committee. Every one of the Chiefs, and the Chairman of the Joint Chiefs of Staff, and every one of the Secretaries of the Services and the Commandant of the Marine Corps, said this question of long-range, precision strike through space was the most critical unmet need in the United States military.

And let's go to the third point I wanted to talk about, which is real-life scenarios. Remember, in Libya, in 1979, David Jones, Chairman of the Joint Chiefs of Staff, was called before the Senate Armed Services Committee. The question was whether or not Libya had developed nuclear weapons. And Senator Stennis, from Mississippi, the Chairman of the Committee -- I remember sitting there -- he asked David Jones, "What would you do, General, in a situation as President of the United States, and you saw that Libya was getting ready to strike Central Europe with a missile with a nuclear device on it?" And David Jones says, "I've only got one thing to do. I've got to keep him on the phone for at least 30 minutes."

That was a very telling comment. Because, interestingly, in the Gulf of Sidra, the same thing happened. Ronald Reagan and Margaret Thatcher were denied overflight permission over Spain and France. It took us an extra three and a half weeks to put together the package of 40-some-odd planes, hundreds of soldiers and sailors and airmen, to put together that strike on Libya. The cost of that strike was $55 million in

operational costs. So, it's not cheap when you have to do it the traditional way.

And I find it fascinating that people say, well, oh, no, no, you cannot use space through which to throw a projectile; you have to do it by sea. Well, if you call the Navy and ask, how soon can you get an aircraft carrier at X, they will say, oh, 30 days, 45 days, depending on where they are. Well, when you have a time-urgent target, that doesn't help you. And when they say, Like Joe Circione has often said, well, if we have a problem with a ballistic missile and nuclear weapons on it, we will preemptively take it out. Well, if you are going to use a bomber to do that -- which is occasionally talked about -- you're talking about overflight problems and you're talking about eight, 16, 24 hours, and you are also talking about time urgency and also being able to make sure that you can find the target. So, that's a problem.

In 1995, I already talked to you about the Bill Perry problem, so it's interesting that Libya, over the last decade and a half, two decades, has repeatedly come up with exactly the same issue. Which is they've got a target I have to hit quickly, I don't have the time to do it and I don't have the weapon to go after it and I don't want to go nuclear.

So, finally, what could we do here? In the last few years I was helpful, I guess, putting some money in the budget to

actually demonstrate a hardened, deeply buried target capability. What we did is we took a projectile about this high, sitting out in Space Command in Colorado Springs, after having been used actually. And we did a strike against a block of granite that was about 60 feet solid. And at 4,000 feet per second, hitting in an area within about a meter -- that was the accuracy -- this thing went through that 40-foot block of granite, going at 4,000 feet per second. And it's sitting in I think in Lorenzo's office out in Colorado Springs, and it has a nick in the very top of it about a quarter of an inch. A second demonstration that they are going to do is going to go 7,000 feet per second, and go upwards of 100 feet of solid granite.

So, the idea that you could use a projectile through space to go and get at deeply buried targets and blow it up, implode it -- you don't have to use a nuke, you can just bury it so that the adversary doesn't have access to get that stuff out of the ground and launch it -- you would be doing quite a bit with an extraordinary capability. But this was millions of dollars we were talking about, 1 or 2 or $3 million to do this. The money would be put in the budget. Bill Lynne would take it off budget. Ted Warner wouldn't want to spend it. And in the last three months of the fiscal year we could do something. And this is identified, as I said, in the last eight annual reports to Congress as being critical to do this.

Now, finally, what is in the current fiscal year 2002 budget that we might look at to help in this area of counterproliferation and strikes through space? One area is a common aerovehicle, a reusable launch facility, in which the time to target is in a matter of like 30 minutes. It would help in this respect because the President would not have to commit forces. If he has a 30-hour or a five-day lead time, he doesn't necessarily have to send an aircraft carrier into an area and use it right away. It gives him time for diplomacy to work, which is not a bad thing. So, he doesn't have to act precipitously, and that adds to deterrence.

We could protect out satellites through quick reconstitution capabilities, with either the RSLP program or even a space plane or SMD which can go up and repair satellites. A defensive satellite capability, which I'm not necessarily advocating, is very different than an ASAT. Defending our satellites is not the same thing as giving them a propulsion capability to go after willy-nilly or zooming around the heavens like Star Wars and going after other people's satellites. Because as John correctly mentioned, Saddam Hussein doesn't use satellites. That's what the Chinese were doing over there, laying landlines. Because if we're going to fight, we're probably going to be fighting in the other guys' backyards.

We could also support the EDLV, the expendable launch vehicle, which is needed. That's in the budget. There is money in the budget for LINK-16, which is time-critical targeting -- meaning that our warfighters will give our guys in the plane real-time information about where a target is, which is critical. There is money to increase the space surveillance control, which is look, listen and access space. It's got nothing to do with war in space or military weapons in space. It's just a question of what's going on.

We could also put money into GPS anti-jamming, which is actually in the budget. We could do SBIRS, which is probably the Air Force's highest priority, the Space-Based Infrared Radar System, and the Defense Support Program, which is also in the budget. All of these would improve our access to space, our use of space, protect space, and, in the area of long-range precision strike capability through space, give us the ability to target things that are time critical.

Finally, I handed out an article from the National Defense Industrial Association, which actually gives John four paragraphs and me only one. Elizabeth Brooke wrote it, and it's a very good piece. But it was the last paragraph I wanted to finish on. And that is, when the United States Navy goes through the oceans of the world, I never hear anybody talk about the militarization of the oceans and what an awful idea that is. As

Admiral Sustek has pointed out, there are 16 ports in the world through which go about 89 percent of all world trade, that if they were shut down we would probably see a worldwide recession.

The Navy, as Tom Friedman, the New York Times writer who wrote the book, "The Lexus and the Olive Tree," said the United States military is the umbrella under which the world's commerce and trade is undertaken with no fear that they will be interfered with. And that is no more true than with respect to our Navy and keeping the ports free and the straits free, like the Strait of Malacca, and other places free for trade and international commerce and free enterprise to go on. Just as with space, we can make it a medium where free countries and peaceful countries use it for the good of mankind.

That's where I would like to end. And thank you, Cato, for putting on this very important forum.

DR. NISKANEN: Thank you, Peter.

Our third speaker is Charles Pena. He is our newest Senior Defense Policy Analyst at the Cato Institute. He specializes in nuclear forces, missile defense and military space policy. Prior to joining the Cato staff he was a consultant to the Institute and author of several policy analyses and foreign policy briefing papers on theater missile defense, national missile defense and the ABM Treaty. His most recent policy

analysis, co-authored with Cato's Director of Regulatory Studies Ed Hudgins, is about U.S. space policy.

Charles has already established a reputation of having the wildest ties of the Cato staff.

Charles.

CHARLES PENA,

SENIOR DEFENSE POLICY ANALYST, CATO INSTITUTE

DR. PENA: Thank you, Bill.

I always enjoy speaking after Peter, because he always surprises me. I always have an idea of what I think he is going to say when he is speaking at a forum, and then he always manages to say something just a little bit different, and I think keeps at least me and probably a whole lot of other people on their toes.

Well, as any Star Trek viewer knows, space is the final frontier. Senator Bob Smith, who is one of the more ardent advocates of space power, who John had talked about in his 15 minutes up here, has called space the permanent frontier. Whether it's the final frontier or the permanent frontier, clearly, right here and now, for the military, it's the next frontier. And the question, as John has rightly said, is not whether the military should be or is in space; we're already

there. But our presence there is largely confined to surveillance, communications, early warning, and reconnaissance. To the extent that space is used by the military, it is used to support and enhance traditional military operations on the land, on the sea, under the sea to some extent, and in the air.

At this point in time, there are those who would argue that we need to expand our role in space militarily, and that the U.S. should seek a position of dominance. I'm going to cite the Space Commission a lot, which was chaired by now-Secretary of Defense Rumsfeld, only because it was chaired by Secretary Rumsfeld, and there is a certain amount of importance to that. There are a lot of folks in this town, as well as around the country and around the world, who believe that Secretary Rumsfeld is the architect for this administration's policy with regard to national missile defense and space policy, and that he is the man who is going to pull it all together for this administration. So, there is a certain amount of import to the fact that Secretary Rumsfeld chaired that Commission.

That Commission stated that U.S. national security interests should be recognized as a top national security interest for space policy and that the U.S. must develop the means both to deter and defend against hostile acts in and from space. Well, space is a pretty vast place, and in the 15 minutes that I've got to talk to you this morning, I'm not going to be

able to talk about everything about space and the military. And John and Peter have given some different perspectives on that. But I am going to try to focus on what I think are the two important questions before us today.

The first is, should the U.S. move now to weaponize space? And secondly, should military uses and requirements be the driving force behind our national space policy?

Again, to cite the Space Commission, they pointed out, as has John and Peter, the U.S. is more dependent on space than any other nation. Space systems, both military and civilian, are vulnerable to a range of attacks. Nations hostile to the United States possess or can acquire the capability to destroy or disrupt those systems in space. And the Space Commission concluded that our position is attractive for what they termed a "space Pearl Harbor."

It's true that U.S. space systems are highly vulnerable and that we are more dependent on space than any other country. But the question is, is the threat a clear and present danger?

John mentioned this, and I will be a little bit repetitive. To begin, satellites in space are not the most likely targets if we are worried about our space system capabilities. Ground stations are much more attractive. They are easier to attack, and they are cheaper for would-be adversaries to attack. So, we ought to be spending more time and

pay more attention to these weak links, if we are concerned about the vulnerability of space systems.

For example, theater missile defense and air defense are components that could be used to protect ground stations from short-range ballistic missiles, cruise missiles and aircraft. John mentioned potential commando attacks. And certainly conventional forces and commando attacks are areas of concern that we need to beef up in terms of defending our ground stations. But none of this requires deploying anything in space.

Another likely threat is jamming. And the Space Commission and others have recognized this. And they have also stated, correctly, that there are a lot of countries that possess the capability to jam satellites. It's a legitimate concern and it's nothing new. It's as old as the radio itself. It's simply sending out a stronger signal to interfere with the signals that are being used.

A lot of that can be mitigated, to a great extent, by the use of encryption, anti-jamming -- Peter has mentioned anti-jamming -- and frequency hopping. Frequency hopping is where you move from frequency to frequency very rapidly and you transmit very tiny packets of information. It makes it rather difficult for somebody to jam. They have to know the frequencies you're using and they have to know the timing of the frequencies you're using in order to be able to be on the same frequency and

jam it. But, again, none of that requires us to deploy weapons in space.

As both John and Peter have stated, if there is a need to deploy weapons in space, it is predicated on an anti-satellite, or ASAT, threat. As John pointed out, during the Cold War, both the U.S. and the Soviet Union engaged in ASAT programs. And while at least we may have some residual ASAT capability, it is my understanding that nobody, including ourselves, has a dedicated operational ASAT capability.

So, to the extent that there might be an ASAT threat -- and I will stress the "might be" -- it's a postulated threat, one that the Space Commission and a lot of other people have talked about, and it's really a nuclear threat. They are worried about the fact that there are countries out there who can place a low-yield nuclear device on a ballistic missile that can reach into low-earth orbit, and then simply detonate the device. It doesn't have to be necessarily anywhere near the intended target, but the electromagnetic pulse, or the EMP, will fry all the electronic components on satellites within a relatively large radius of the explosion, or the detonation.

And there are countries that possess either the capability to launch projectiles into the correct altitudes or have a nuclear weapons capability or the potential to build nuclear weapons. But it doesn't mean that just because you have

those two things that you have an ASAT. And so far at least, there are not any countries that have mated those two capabilities into a dedicated ASAT weapon.

More importantly, this threat is nuclear. And although such a weapon would not be directed at a terrestrial target or U.S. forces or U.S. citizens per se, the nuclear threshold would still be crossed. And even a so-called irrational adversary would have to think twice and give pause to wanting to use a nuclear weapon against the United States. And certainly I can't imagine any U.S. President sitting back and saying, oh, I guess that's okay for whether it's Saddam Hussein or whoever to detonate a nuke in space and, even though we're fighting this conventional war on the ground, would just keep it conventional and we won't worry about it, we won't do anything about it. I have to think that the nuclear threshold is the nuclear threshold, whether you cross it in space or you cross it on the ground, and that if you use nukes against the U.S., that the U.S. will extract an appropriate and proportional response, just as our doctrine has always called for.

If there is going to be a real ASAT threat, I think the one that bears taking notice is the so-called microsatellite threat, which is largely attributed to the Chinese. About 18 months ago there was a report that the Chinese has ground tested specifically a microsatellite ASAT.

As the name implies, microsatellites are really tiny, so they are hard to detect. And my understanding is that these potential microsatellite ASAT's are so small that an adversarial country could send them up; they could somehow covertly be attached to our satellites, or maybe even hidden inside another "legitimate" satellite. And when the time comes, they are programmed and then they are told to go attack whatever the satellite is. Again, if these things work the way they are supposed to work, they would be very difficult to detect and certainly very difficult to defend against. And this threat should not be just cavalierly dismissed. But the question is, what is the appropriate response?

To talk about foreign policy just a little bit, Cato's Vice President for Defense and Foreign Policy, Ted Galen Carpenter, has stated that, at least in the case of China, if we made it clear that we were not prepared to go to war with China over Taiwan because we don't think Taiwan is a vital national security interest, that would go a long way to perhaps deterring the Chinese from wanting to develop and deploy ASAT's to challenge us in the first place. But even if we adopted such a restrained policy towards China, they still may go ahead and decide, we're going to develop this ASAT capability anyway. I mean, there is certainly no guarantee that they would not do that.

And if they did that, what could we do to potentially counter it? If they are conventional in nature -- they're not using a low-yield nuke as the device -- hardening our satellites isn't going to do any good, because it won't protect against the EMP. Maneuverability is one possibility, allowing our satellites to evade or dodge an attack. And that might increase total system costs -- some of the estimates are -- by 10 to 20 percent for a particular satellite.

Self-defense is really problematic if you can't detect these things to begin with or if they might be housed in a legitimate, non-threatening satellite and then only released during time of conflict. Certainly we wouldn't want to adopt a policy of shooting down every Chinese or other country's launch of a satellite on the assumption that maybe it might have a microsatellite on board and maybe that microsatellite might have an ASAT capability. Nor do I think we want to be in the business of presuming every satellite in orbit might be a microsatellite with ASAT capability and shooting that down.

So, if this threat ever becomes real, I think maybe, at least for now, the best and least costly response might be the use of decoys that simulate the radar and optical signatures of the threatened satellites. One estimate done by one of the Commission's staff members was that decoys might increase system cost from 1 to 10 percent. And another potential way to deal

with these microsatellites could be through the use of jamming, if they have to home in on the targeted satellite.

In the final analysis, at least today as we sit here now and look out through the near- and mid-term, I don't see a clear and present danger in terms of our satellites in space being threatened. Indeed, as the country most reliant on space, I think the U.S. has more to lose than to gain by making space the next theater of operations and extended battlefield. And as important and vulnerable as our space systems might be, if we actually moved to deploy weapons, whether they are defensive or offensive, it will likely be perceived by our adversaries, our potential adversaries, as more threatening than the status quo. And while I can't sit here with a crystal ball and guarantee you that if we don't weaponize space that China and others will go along with the game as we would like them to play it, I can pretty much say with absolute certainty that, if we do, they are going to do something about it. And they are going to do the very things that we would like them not to do, such as develop ASAT's.

Given that I don't think the threat is as dire or the situation urgent, not only is an aggressive military approach in space not warranted now, but military requirements and uses should not be the driving force behind our national space policy and how we choose to use space. Certainly there are some

legitimate and unique military requirements for space -- one of which is tactical warning and attack assessment.

Peter mentioned systems such as SBIRS and DSP. Those are unique military assets of the military that are only used for things like missile warning. But virtually all other uses of space are dual-use, meaning they have both military applications and commercial applications and commercial users. As such, military needs and requirements should not be imposed upon or dictate these other uses. And while recognizing some legitimate, unique military requirements, here is my laundry list of things we ought to be doing in space:

Wherever possible, the military needs to make use of commercial assets, rather than needless spending on unique military assets, for cost savings. And two areas where this could happen is in communications and less-than-real-time imaging. Also wherever possible, the military should consider using distributed and redundant systems to reduce vulnerability, particularly if they are sharing commercial systems, rather than deploying expensive military-unique satellites which are also likely to take longer to develop and deploy than using less expensive distributed and redundant capabilities.

For example, it might be more cost effective to deploy smaller and lighter distributed satellites at low-earth orbit or medium-earth orbit than to deploy larger, heavier, dedicated

satellites in geosynchronous orbit. Military requirements should not be imposed on commercial systems that are being shared. Another example is if we have a requirement for hardening against EMP, that requirement shouldn't be imposed on commercial systems if the military is going to be using those systems. And the military is going to need to make a very strong case that they need that EMP hardening and have to have their own dedicated satellite that is EMP hardened.

Finally -- and I know this is a concern of my colleague here, Ed Hudgins -- we need to ensure that the national security policy and military requirements are not so stringent and restrictive that they place a stranglehold on U.S. companies' ability to compete in the international space marketplace. One example is export controls and how they might affect U.S. companies' ability to work with and use other foreign companies, or launch facilities as the case might be, for competitive advantage.

What I am suggesting here is that the military must learn to make better use of and integrate commercial assets for their requirements while still recognizing that there will always be certain unique military requirements for space use, such as DSP or SBIRS. More important than that, though, is recognizing that the military shouldn't be the driving force behind our space policy. In fact, it probably ought to be the other way around.

I think the military needs commercial space much more so than commercial space needs the military.

John Logsdon, who is the Director of the Space Policy Institute here at George Washington University, just on the other side of town, has said that there appears to be no demand from the operators of commercial communications satellites for defense of their multi-billion-dollar assets. He also says, if there are active military operations in space, it could be difficult not to interfere with the functioning of civilian space systems.

So, in conclusion, in the post-Cold War environment, with no immediate threat and no strategic peer competitor on the near- or mid-term horizon, we need to avoid establishing overstated and costly military requirements for space-based assets. We need to recognize that military power is not the basis for our defining relationships between nations in the post-Cold War period. Nor does the military -- and I guess I will take issue with Peter on this -- nor does military power guarantee economic security or provide for economic freedom. Ultimately it's the marketplace and marketplace solutions that define the world we live in and how it operates and how it is shaped. And as such, we should strive to foster a space environment that allows commercial space to grow and flourish, rather than using space as a new area for military competition.

Thank you.

(Applause.)

DR. NISKANEN: We have some time now for questions. And I will ask the first question, which I hope provokes some conflict. What new military role in space would increase our national security capabilities? We heard about the importance of defending our current space systems. We heard a case for a separate Space Command. We heard a case for a new missile to destroy hard ground targets. We heard a case for increased military use of commercial space systems. But we did not hear any proposal for a new military role in space, specifically the weaponization of space. Now, did I miss something or should this be the primary shared conclusion of this panel? We ask for the response of our panel here.

MR. HUESSY: I think it may come down to what words you use. If you want to call it weaponization of space, I guess you can call it that if you want. But throwing a projectile, not a missile, the platform can be sea based, air based or space based, that delivers a projectile many thousands of miles within a period of 30 minutes to 60 minutes when that time-urgent target is necessary to be taken out.

Now, is that a new role in space for the military? Yes. It has been identified by every annual report to Congress in the past eight years. It has been identified by the Chiefs as a critical unmet need. And if that is a new role for the

military in space, so be it. I hope my remarks were explicit enough that that's what I would hope we would explore and develop.

The military has to modernize and sustain the current things we do in space, which have been -- to some degree that's an understatement; I'm trying to be fair -- have, for the last eight years, not been taken care of. And everything from protecting our launch facilities, which the Chief of Staff of the Air Force has said -- and John Pike and Chuck both said we should do -- that's in his priority list. He has talked about sustaining our ability to see and look and assess what's up there.

So, there are a lot of things we need to do just under current doctrine. I think the thing that the Rumsfeld Commission pointed out is, how should we organize ourselves to do this? And what should we do in the future? And that's why I think this is a good forum, because obviously there is not total agreement on what we ought to do, but at least I think both John and Chuck have laid out kind of some of the parameters of where the debate is going to be.

DR. NISKANEN: And this new missile or device that you've talked about, is it either critical or preferable to base it in space?

MR. HUESSY: You wouldn't base it in space, because either you have to have it unmanned and flying around all the time; and if it's manned, it can't stay up there more than the time a pilot can stay awake, or he and a crew. So, there is no need to do it. The question is, if you launch something from an AEGIS cruiser, and the cruiser is in the Persian Gulf and I have to send it to the South China Sea, I am 63 days away. And the target may have already been used by that time or diplomacy may be beside the point by the time it gets there.

So, whether it's 32 days that the cruiser takes to steam from the Persian Gulf for the South China Sea, it is measured in weeks. And certainly that is why there is this particular issue of prompt, precision strikes through space. Also, it is not just the promptness; it is also the deeply buried targets. All our adversaries, where are they putting their chemical, nuclear, biological plants and facilities and missile complexes -- like the North Koreans? They are burying them underground.

DR. NISKANEN: John, you were shaking your head about this.

MR. PIKE: Just to go the point of going against deeply buried targets, this business about, let's use the hypervelocity penetrator to destroy deeply buried or hardened targets, this concept has been around for a long time. And basically all you

are talking about here is taking something like an ICBM and, instead of having a nuclear warhead on it, have a jumbo version of the penetrator rod that we use for the antitank penetrator rod. And the idea is this thing is going to be able to penetrate dozens of feet of rock rather than just having to go through a much smaller part of armor on a tank.

This idea has been around for a long time. And, in principle, I don't see that there is anything particularly objectionable or repugnant about it. I would say that, in practice, I think that Peter has substantially understated the alternative capabilities that we have for addressing these. It is, generally, the steaming time between the Gulf and the South China Sea is more like about 10 days rather than 63 days.

But the fundamental thing I have never been able to understand about this is we currently have a lot of different ways of closing the portal. We currently have a lot of different ways of trapping them inside their bunker, because we can see the portal and we have a lot of different munitions that can basically close the door on the place. The part that I have never been able to figure out about these penetrators is, how do we find the bunker in the mountain? Because, historically, the way that we have dealt with bunkers is multi-megaton nuclear bombs, basically just going to blow away the entire mountain.

I don't know how much time you all have spent looking for the bunker sign and going through imagery and trying to figure out where the bunker is. And I don't know how much time you have spent looking at Raven Rock or looking at Cheyenne Mountain, but I have to tell you that the bunker on the inside is very small relative to the mountain on the outside. And there is just no way at all to tell from the outside where the bunker is on the inside.

So, if what we are talking about doing is taking the top off of an SS-18 silo, well, you know where the silo is and if you can get the door, then you have solved the problem. But if you are talking about trying to get a deeply buried bunker, you have no idea where inside the mountain the bunker is. And so you are basically just going to be riddling this area with all of these teenie little holes, on the off chance that of the hundreds of these things that you're firing, one of them is going to find the very microscopic part of the mountain that actually has the bunker in it.

So, it seems to me that the problem is not our kill capability; the problem is the intelligence, is the targeting capability. And I am absolutely at a loss, except for maybe some big dousing rod or something, to figure out how you are going to be able to find this very small bunker inside this very large mountain. Which is why I think we have not done this thus far.

DR. NISKANEN: Yes?

MR. MCFADDEN: George McFadden, a consultant on East Asian security affairs.

Chuck, you mentioned economic security. And it reminded me, of course, that a lot of people are thinking and writing about nontraditional threats and nontraditional warfare. Maybe I can pose a question in that area by asking, how about information warfare in space, is that weaponizing space? And I guess I am a little surprised that it was not mentioned more directly by the speakers. Would you address that subject for me, please?

DR. PENA: I guess first I will ask you what you mean by information warfare.

MR. MCFADDEN: I of course mean using space as we might use other assets in order to disrupt financial systems or disrupt command-and-control systems or to jam satellites, all these kinds of things.

DR. PENA: I think I would classify that as that is what we do now with a lot of space assets. So, I wouldn't call that weaponizing space. As far as jamming command-and-control and financial systems, that may be beyond a military purview to jam financial systems, but certainly command-and-control systems. But I don't think it's the military's job to disrupt financial markets. So, I wouldn't consider what you are calling

information warfare weaponizing space. To me, weaponizing space is putting something up there that shoots things down, whether they are other things in space or shooting at airborne, terrestrial or sea-based targets. And I guess we seem to have some sort of small consensus that maybe that is not the right thing to be doing right now.

MR. PIKE: The reason that I was unavoidably provoked on the question of how do you define information warfare is that there are obviously more definitions of information warfare than there are people who are thinking about information warfare. But if I was not sufficiently explicit on this point, I think that military space systems are information warfare; they have always been information warfare, and the sooner we have a separate Space Force that is organized to focus on information warfare and has as its doctrinal premise information warfare as opposed to air warfare, the better off we are all going to be. Because it seems to me that what the space systems have done during the Gulf War, did do during Kosovo, do every day, is information warfare, giving us information dominance, giving us dominant battle space awareness.

Now, the business about canceling Slobo Milosevic's family's credit cards so that they had to come home because they couldn't charge the hotel room, that may also be information warfare, but I think it's only a very small part of it. And the

most fundamental part of it is that American decisionmakers -- political, military -- need to know what's going on. And we need to have a better understanding of what's going on than anybody else does. And space gives us that capability. That's information warfare.

MR. MCFADDEN: One of the reasons I bring this up is because I've played many war games, where the thought is we must make it clear to any potential adversary that there are certain limits, almost as we discuss limits on nuclear warfare, that if you move to disrupt the certain systems which could be devastatingly disruptive to society as a whole and so forth, that that will be viewed in the harshest terms by the U.S. and so forth. And so I think it's realistic to consider that we are looking at this proposition in space and determining what our reaction will be to people who may take that sort of action.

DR. PENA: And that's not very different than cyber warfare and malicious hackers who try to take down whole systems, whether they be national security systems or financial systems. But I think we're into a different ball game. You're talking about people doing that potentially during peacetime as opposed to that's the nature of war.

MR. PIKE: It's not simply potentially in peacetime. I mean Code Red knocked the Defense Department offline for about six weeks and, frankly, no one even noticed. Code Red basically

shut down the Defense Department's public access Web servers, with the exception of Defense Link and a couple of others, basically shut down everything for the last six weeks. And nobody even noticed. Nobody even noticed. And I would say, frankly, that until we have a little after-action review on, number one, how it was that DOD basically went offline for six weeks, when none of the commercial services went offline, why is it DOD went offline and nobody else did and, number two, why did no one notice that DOD went offline? I mean, we just had an electronic Pearl Harbor and nobody even noticed.

MR. HUESSY: I would like to respond, if I could, to John's comments about some of my remarks. I will get permission from the Space Command, John, for you to read the 500-page transcript, which I paid to have transcribed, of our conference, which included Litton Brooks, Dave Smith, two-, three-, and four-star generals, people who do this night and day.

We know where the targets are. The problem is that our adversaries figured out, from not only the Gulf War but the Revolution in Military Affairs, that they have to bury these things in order for them to be currently outside of our ability to go after them, unless, as Bill Perry let slip in the mid-1990's with respect to Libya, nuclear devices. And Aspin said very much the same thing with respect to the underground nuclear facilities in North Korea. We do know where they are.

Now, this is an age-old argument -- whenever you come up with a new technology that you want to do, we are always told, oh, yes, we tried that years ago and we cancelled it or it doesn't work. This has just emerged that the Pentagon doesn't put money in the budget for anything unless you have a mission needs statement and you also have the requirements. You go through an ORD. You go through hoops that most of us would get buried alive. But we went through all that. And the idea of imploding the facility is that there is not only not access to it from the outside, but those inside can't get out.

So, the fact that you might not physically actually blow up the lab where the bios are being made -- the bugs or gas or whatever -- is they can't do anything with it. They have to dig themselves out. And let me tell you, we'll know if they start digging themselves out.

So, John, this is a very serious problem, and people of all sorts of political persuasion, who initially came to this saying, no, it's not a problem, have concluded it is a problem. And all we are trying to do is start a small-scale level of technology development to see, can we do it, what would be the cost. And I know what a conventional ballistic missile is; I have proposed it and advocated it. But this is not necessarily that. You can base it on a CAV, a common aerovehicle. You could base it at sea. And you could base it on a space plane of sorts.

But you don't have to keep it up there all the time. Just put it up there when you need it.

The question is to be able to deliver a projectile thousands of miles in a matter of 30 minutes. As David Jones said, the only thing you could do is keep Qaddafi on the phone for 30 minutes and let the President then decide whether or not to use nuclear weapons against him. That was 1979.

DR. NISKANEN: Yes?

MR. HEITZ: Klaus Heitz, the 3-Sigma Group. I think it's more a comment.

I'm a little bit shocked by the absence of basic strategic thinking on doctrine. I have not heard a single principle except for the one last issue, which is a negative one, a positive one -- namely, what about the civilian and commercial uses of space and the interaction? Space and the military is a strategy issue; it is a very important issue. But it has to be, I guess, under the military doctrine. I am shocked. Everything that Mr. Pike said is that a new type of virginity of space should be preserved.

Since the virginity of space cannot be maintained, I'm reminded of the debate on Lewinski and Clinton, whether they had sex or not. I mean, we are in space. The military should be used. The same as the Navy. These are phony, weak arguments, which go over very nicely in the press and on TV, but they do

unjustice to the seriousness with which the debate should be conducted. And maybe the military has won, in the sense that they make sense. The compliments coming from Mr. Pike on how well the military did using military assets in space, I didn't hear those in the seventies when these assets were to be funded -- you know, what types of other systems were better. There is a certain hypocrisy that goes on, but more shocking is the weakness of the argument.

In the fifties, we had a very strong discussion of doctrine, the debates between Herman Kahn on one side and, for example, Oscar Morganstern on the other, I think they are still unresolved. I haven't seen the new book on the question of national defense and why actually sea-based systems have vast superiority over anything and this should be actually single-handedly done. Now, this wasn't against the Air Force, mind you, but the basic idea was the huge mobility and the openness of the seas, and I think the same arguments really apply to space. And that's the debate I would actually expect to have conducted here.

The last point on the negative effects. Having a monopoly on space should not lead to protectionism in space. One has to keep space open for commercial/civilian use. I think that's an extremely important point. And the military today, in a phony sense of national security, has done great damage to the commercial and economic uses of space already.

Thank you.

DR. NISKANEN: Another question in the back?

MR. EARLS: My name is Christopher Earls, Office of Naval Intelligence.

My question is for Peter. There has been a lot of writing in the last decade in the open source literature about two pressing needs -- one being rapid reconstitution of U.S. satellites after an attack, and that we currently have a single point in the launch facility at Canaveral. It takes six months and an act of Congress to launch anything. And secondly, making our satellites smaller and putting more of them up to make them more redundant and survivable. Can you give us your impression of the emphasis on those requirements in the defense budget in Congress and DOD?

MR. HUESSY: That is a very good question. The person who probably can answer that better than I is sitting in back there -- Hank Cooper. But let me try to answer it this way. Launching satellites into space is not a cheap proposition for the United States. Manned space flight took over back in the sixties. And we built boosters that were very large and that were basically built by spec for that particular launch. And if there was a problem with this booster, you scrapped the launch.

Now, a number of our companies in this country are using Russian Proton rockets. And they are extraordinary

engines. They really are. And we have a very good cooperative relationship with Russia. It does hurt our domestic launch business, which gets to the point that we went for big missiles like Saturn and Atlas. And the question is, to have a rapid reload constitution capability, you need a reusable launch capability, you need the expendable launch capability, all of which are in the budget.

But we have had such a debate from A to Z on how to organize space and what to do that we have gone like a yo-yo -- if you track the space budget not only in the Defense Department but NASA and look at the impact of the Space Station and a variety of other things. That's one of the reasons the Rumsfeld Commission did what it did. And people say that it should have been on more detailed programs, but it was trying to say what should we do in space and how should it be organized. And how should it not only protect America's security but, as Chuck has pointed out, you have to protect the commercial aspects of space as well.

I think those are two things -- how rapidly can you reconstitute a satellite in the midst of a fight; it takes a while to orbit a satellite and figure out what it's doing, make sure it works -- and so I could see reconstitution, if there was a failure, if you had a technological problem that you didn't expect -- and that's why you need redundancy. And there is money

in the budget to improve the protection and redundancy of our ground systems. All of which needs to be done.

I would like to say there is no silver bullet here, and I believe there is no silver bullet in any political or technical, economic, military problem. It's across the board. And it requires sustained, heavy work. And as someone who has worked in this vineyard for 25 years, often 18-hour days on the Hill, trying to put a few dollars in a budget to do something, and then have someone get on television and, with a smart slogan or a bumper sticker thing, who knows nothing about the program, undo five years of work and, at the same time, then says, oh, weapons of mass destruction in Korea, well, use the B-2 Bomber.

Well, Joe Circione, you worked for John Conyers for years and Mr. Bennett on the House Armed Services Committee, and you did nothing but oppose that plane, and tried to kill it. And we eventually only built 20 of them -- or 21 actually if you include all the parts. So, this is a long-term, sustained issue. And the press does a disservice to the extent to which they engage in bumper stickers.

And I must say, one thing I admire about Cato is the principled way they look at things -- you may not agree with everything -- but the principled way as opposed to necessarily an ideological way. And I think there is a big difference between the two.

MR. PIKE: Your question basically goes back to what I said at the very beginning, that space is different. Launching a satellite has got a lot more to do with building a ship than flying an airplane. And to the extent that you think that air and space are about the same, and space is just a little bit higher up, then it makes eminent sense to have a rapid reconstitution capability. Because that's the way the Air Force works -- if one of our airplanes gets shot down, we have another airplane take off to replace it.

In the real world, real satellites put up by real launch vehicles have life cycles that look an awful lot more like building a ship. And while we were certainly able to build Liberty Ships during the second World War on a time scale of weeks, not years, I think that there is a reason that, over the last several decades consistently, this rapid reload, rapid replacement option, for satellite survivability hasn't attracted much attention.

The other reason obviously, of course, is that if the other guy can shoot down your satellites at all, I mean, in principle you are in a situation where you have an unfavorable cost exchange ratio between your satellites and his ASAT's. And if he can shoot down any of them, almost by definition he is going to have a capability to shoot them down as fast as you can put them up. So, why we should just be sitting there feeding him

billion-dollar targets for him to shoot down with his million-dollar satellites, even if we were physically able to do so -- which, in the real world, we are not -- I would not be able to understand it.

I think that what we have to do is make sure that it's very difficult for him to shoot them down to begin with. In which case we don't need that reconstitution.

DR. NISKANEN: I'm shocked that someone would not agree with everything that Cato stands for, and maybe we should close the panel on that note.

(Laughter.)

DR. NISKANEN: But let's have two or three last, short, brief questions.

Fred?

QUESTION: Fred Singer, Science and Environmental Policy Project.

The issue I heard discussed this morning -- and I think it's the one we need to address -- is whether the United States needs a full-fledged ASAT capability or whether we should put our money into protecting our satellite assets. I think what I heard is that we should do the latter, and that the ASAT capability is something that our adversaries will use against our satellite assets.

Now, redundancy is the obvious answer, but I don't agree with Mr. Pike that this is a bad proposition. Air-launched satellites, miniature satellites, can be cheap, launched quickly, and I think the exchange ratio in terms of dollars may actually turn out to be more favorable to us than he thinks.

DR. NISKANEN: Yes, another question right here?

MR. BALSAM: John Balsam, with the Synthesis Partners, out in Reston, Virginia. I'm a technology scout; I guess you could put it that way.

One of the things that has intrigued me has been the extraordinary growth of the commercial satellite industry in the last few years. Right now, if you look at the amount of investment that is going into things like high bandwidth, Internet over satellite, the sophistication of the birds that are going up there, they are getting bigger, going out of geosynchronous. We are looking at birds right now that are pressing 11,000 pounds, very extensive. The low-earth orbit content market has come a cropper, mostly attitudinal should we say, because of Global Star, ICO and so forth.

But if you look at the amount of production capability that is out there in the production lines around the world, we have got a lot of capability. And I look at the existence of this, should we say, raw producibility, raw manufacturing prowess; the other thing that is very interesting is what I call

the technology churn. The technology churn that is going into the commercial satellite industry, in many respects, is well ahead of anything you're seeing in the military. I think a lot of the military's problems with robustness, redundancy, relaunch, reconstitution, et cetera, et cetera, I think a lot of this is going to be solved, so to speak, as commercial forces evolve. This probably was not predictable a few years ago.

One final thing with regard to reconstitution and so forth. There is a very interesting concept coming along right now that the Air Force TechSat 21 Program is pushing, which is basically distributed function satellites; in other words, cluster satellites. Sure enough, there is commercial interest in this. And what you are beginning to see is so-called emerging space concepts that come out of my old customer, the Air Force Space Technology Directorate at Kirtland. There is a very interesting phenomenon right now in which you are getting startups that are working very closely with companies that are looking commercially at some of these new emerging MILSPACE capabilities right away. We have not seen that before.

And one final thing I will point out, on the sensing side, we are seeing a very interesting development in the commercial sector of things like real cheap, long-wave infrared imagers. I just did a study, looking for some uncooled IR imagers. Next year, you will be able to buy a complete camera

for $800 to $1,000 -- uncooled IR, using silicon microbolometers. It's MEMS technology, micro-electromechanical systems technology. You can turn these thing out like you would not believe it. That is going to change a lot of the paradigms, et cetera, et cetera, that we are kicking around here. It's going to turn them upside-down.

One final thing about ground-based targeting. There are ways -- and I've got a separate project right now that I'm looking at -- there are ways in which you can do three-D rock imaging; detecting where the bunker is is no problem.

DR. NISKANEN: You heard three final points, all good, in this last comment. Let's have two more questions, and that's it.

MR. WOODS: Bob Woods, with TRW.

The problem of deep, hard and buried targets is extremely difficult and very, very pressing. Finding them is not difficult. Mr. Pike understands what archival footage is. We have a lot of it. We watched those bunkers being built. During the Kosovo and Serbian operations there were a number of bunkers that were used, and we could not take them out. We hit them. We hit them hard. We hit them with Tomahawks. The United States hit them with everything we had.

We hit the portals. We hit the air conditioning systems. Those bunkers were built to take World War II-size

bombs just being dropped on them continuously. Everything on top of them was leveled -- which were administrative buildings, by the way, so they looked destroyed -- but they could not be taken out. There needs to be a new weapons capability to take those deep, hard and buried targets out. If we are not allowed to use nuclear weapons, which is about the only capability that can do it right now, there has to be something new.

DR. NISKANEN: One final question.

MR. SINGER: Jeremey Singer, with Space News.

I wondered if the panelists could talk about any future trends in communication satellites, and briefly tell us anything to watch out for, areas where more work should go into it.

MR. HUESSY: I think that the question answers itself. It's quite obvious that over the last decade there has been a fundamental shift towards reliance on either commercial communication satellites for military applications or use of commercial standards satellites for military communications. And you have obviously had this bizarre bandwidth revolution over the last decade that has largely been predicated on progress that you have seen in the commercial sector.

It is basically the communication satellites today that are the reason that other countries have ships and we have fleets. And it is the reason that other countries have soldiers and we have armies. It is those communication satellites and the

wideband communication capabilities that are basically giving our military capabilities that no one else has. And I don't think that that evolution stopped this morning when we got here. I think that we are going to continue to see that unfold for at least another decade.

DR. NISKANEN: In the spirit of the discussion, let's thank our panel.

(Applause.)

DR. NISKANEN: We will have a brief coffee break now. We will reconvene here at 10:45 for the next panel. Thank you.

(Recess.)

PANEL 2

THE IMPLICATIONS FOR U.S. SECURITY OF DETERIORATING RUSSIAN EARLY WARNING SYSTEMS

MODERATOR:

IVAN ELAND, DIRECTOR,

DEFENSE POLICY STUDIES, CATO INSTITUTE

DR. ELAND: Let's get started with the second panel. I'm Ivan Eland. I'm the Director of Defense Policy Studies here at Cato.

For our second panel today we are going to switch gears a little bit. It is going to be on the poor condition of the Russian early warning systems and what to do about them. Most of us have probably heard horror stories about the deteriorating Russian early warning systems, including the famous incident in 1995, in which the Russians almost launched their weapons when they mistook a scientific rocket launched from Norway as a nuclear precursor launch.

The second panel today will discuss the state of those decrepit early warning systems, the threat, if any, they pose to the United States, and what, if anything, the United States

should do about alleviating that threat. I will keep my introductory remarks short so that we have maximum time for the panelists to speak and the audience to participate at the end through questions and answers. I will just introduce the speakers in the order they are going to present.

The program mentions that Frank Dellermann, from DOD, was going to be here. He unfortunately couldn't make it, so his Deputy, Philip Jamison, is going to be taking his place today. Philip Jamison is the Deputy Director of the Office of Strategy, Forces and Operations, which is part of the staff of the Assistant Secretary of Defense for International Security Policy. Mr. Jamison was a Naval aviator, who served in Vietnam, and accumulated 342 combat missions over Vietnam and Cambodia, flying Huey gunships for close-air support.

He also worked, when he was ashore, in the strategy and policy area. He has service with the former Arms Control and Disarmament Agency; a tour of duty in London as Chief, Nuclear Policy Division, working for the Commander-in-Chief of U.S. Naval Forces in Europe; and duty at the State Department as a Navy representative on the staff of the Special Assistant to the President for Arms Control.

After he completed his Navy career, he got an appointment in the Office of the Secretary of Defense, and he is currently assigned responsibility for policy and programs related

to nuclear forces and missile defense policy, including missile early warning cooperation with the allies and friends of the United States. In January 2000, he was recognized by the U.S. Ambassador to Moscow for organizing a successful cooperative military venture with the Russians, in which U.S. and Russian military officers stood watch side by side at a missile early warning center in Colorado Springs during the Y2K changeover.

Most recently, he was heavily engaged in discussions with the Russians concerning a presidential summit initiative to establish a joint warning center in Moscow, to share the early warning information.

Our second speaker today is going to be Ambassador Cooper. He is Chairman of the Board of High Frontier, a nonprofit, nonpartisan educational corporation, formed to examine the potential for defending America against missile attack. He is also Chairman of Applied Research Associates, Senior Associate of the National Institute for Public Policy, and also a Visiting Fellow at the Heritage Foundation.

Ambassador Cooper led the development of President Reagan's space arms control policy while serving as Assistant Director of the Arms Control and Disarmament Agency, and as Deputy Assistant Secretary of the Air Force earlier in the Reagan administration. He was President Reagan's Chief Negotiator at the Geneva Defense in Space Talks, and he was Director of the

Strategic Defense Initiative Organization during the Bush administration.

Our third and last speaker is Geoff Forden. Geoff is a Senior Research Associate for the Security Studies Program at the Massachusetts Institute of Technology. Previously, he was a Strategic Weapons Analyst in the National Security Division of the Congressional Budget Office.

In 1997, Geoff spent a year as a Science Fellow at Stanford's Center for International Security and Arms Control. Also, Geoff Forden has done a paper for Cato on the Russian early warning systems, and he will be speaking about that today. It's out on the table just outside the auditorium.

I guess we will just start in here. Each speaker will have 15 minutes, and then we will take questions after that.

Mr. Jamison, why don't you start.

PHILIP JAMISON, DEPUTY DIRECTOR,
OFFICE OF STRATEGY, FORCES AND OPERATIONS,
OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
FOR INTERNATIONAL SECURITY POLICY

MR. JAMISON: Good morning.

I'm not going to use many acronyms if I can help it, but a couple of them that will show up: one is Joint Data

Exchange Center, which we call JDEC; and another acronym that might come up later, Shared Early Warning, or SEW.

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Why early warning cooperation with Russia? There are a number of good reasons. During the latter part of the previous administration, we were concerned somewhat about the strategic stability issues. And this last bullet -- to reduce the risk that a false missile attack warning could result in an inadvertent launch -- was really our primary consideration at the time. And this sort of philosophical background behind why we were doing early warning is to shape the way that we proceeded in terms of negotiating the MOA.

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These are just highlights of a pretty long history of trying to arrange some type of early warning cooperation with Russia. And it actually goes back to the first Bush administration and a number of talks that were held with one of the Ministry of Foreign Affairs officials, Mr. Mimedov, who, coincidentally, is still on the job as Deputy Foreign Minister, and held talks last week with Under Secretary Bolton. So, we have essentially been talking to the same person for the last 10 years.

We did propose, in the July and September 1992 talks, of which I helped in doing the backup papers and so on for those

talks, we did propose a Global Protection Center, which was essentially a joint warning center concept. The idea for a joint warning center with Russia sort of got lost in the early part of the Clinton administration, but picked up again when we decided that the strategic issue that I referred to earlier was something that we needed to be concerned about. So, we did propose, by the September 1998 Moscow Summit, a joint warning center concept to Russia again.

Preceding that, we were thinking more in terms of missile defense and particularly theater missile defense. So, in an earlier summit, we actually talked to the Russians about providing them missile tracking information, in terms of some type of combined TMD unit or TMD exercise.

But jumping to the Moscow Summit, we proposed the joint warning center. And we did have a break in the negotiations because of the Kosovo action. The Russians basically didn't want to talk to us for a while, with one major exception. They kept talking to us in terms of putting together this so-called Y2K Center. That was a temporary joint warning center, if you will, that was set up for about three weeks during the millennium turnover. And as it turned out, that became the perfect prototype for what we eventually arranged with the Russians in terms of a permanent center. One difference, of course, is it

was in Colorado Springs instead of Moscow, but I will get into that a little bit later.

Finally, in June of 2000, the two Presidents finally signed the agreement that established the joint warning center, or the JDEC which it was called by then. And then, at this time last year, we got the authorization money we needed from Congress.

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The Summit, in addition to establishing the fact that we would do joint warning together, also put the center in Moscow. That was a special request to the Russian Government, and specifically President Yeltsin at the time. We would have actually preferred it be some place else because of the difficulties of doing business in Moscow, which has proved to be true as we try to implement the agreement.

They did establish the principle that it would be real-time -- or, as we say, near real-time, because nothing is instant -- on ballistic missile and space launches. Of course, each side reviews its own missile launch detection systems. And at that time we brought up the idea of a prelaunch notification regime, which essentially expands upon the launch notification we are required to give under the START Treaties.

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As I said, the Y2K Center experience turned out to be quite positive. The negotiations were fairly difficult, in that we had not really tried to put anything like this together before. But once 18 Russian military officers came to Colorado Springs over the millennium turnover period, we had a positive experience. There actually were a few missile launches during that period of time. The system worked as advertised.

The one big difference was that we were using only U.S. data at the time. We had a redundant type of communication hookup with Moscow, in which we relayed to them everything we saw, but we weren't getting anything in return. And basically, there wasn't time to set that up. But we had, I think, six means of communicating with Moscow set up, and all of them worked, of course, through the Y2K period.

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This is sort of cartoonish, but I think it gets the idea across. The satellite on the left is of course our DSP system. It is our primary launch detection system. It covers the world. When we detect a missile launch, the processing actually starts with the satellite. It starts at a ground station in Colorado. It goes to what we call the Central Distribution Facility, which is Building 1840 at Peterson Air Force Base, if you've ever been there. And it was the former location of the Y2K Center. And it just automatically goes

through computers at that point and is distributed over long-haul communication to Moscow, or will be distributed to Moscow.

Just the way our early warning system works in sort of simplified form is that there is a human in the loop in Colorado that looks at the information for less than half a minute, just to make sure we didn't see an explosion or something like that rather than an actual missile to track or a space-launched vehicle. And that human in the loop is there regardless of where the information is going, whether it's going to U.S. forces or our allies or Russia. Once that individual confirms that it was in fact a missile launch, the information then is just sent out worldwide.

So, the JDEC in Moscow will get the information and display it at approximately the same time as U.S. forces, say, will see it in the Balkans or someplace. So, it's not delayed because it's going to Russia. But note that there are two separate displays. We are not making any attempt, at least at this stage of the game, to electronically fuse Russian information with U.S. information, and there are a number of good reasons for that. But the display that is seen in the JDEC in Moscow will be a near real-time display of an actual launch event. I think we estimate about 90 to 100 seconds after we detect the launch, the information appears on a display. Of

course, the Russians are free to pass that information to their own warning center.

The hookup with our National Military Command Center is just a simultaneous display of what is being shown in Moscow. So, they are seeing the same picture. But it doesn't go through the National Military Command Center.

We also would like to have a backup means of communicating this information in case the data path fails. The information that I just described actually appears on a computer screen with the allies, with Moscow, wherever, but there is no voice, there is no conversation involved. It just appears. We have found over the years that it is better to back that up with a voice communication, basically repeating the same information. But that will be part of our setup once we get the JDEC going.

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These are the elements of information we report. Of particular interest really would be the launch location and time and the direction it's going. And then, for those that are in the impact area, of course, when do we estimate it's going to impact. And I say "impact area" because the nature of detecting missile launches with satellites gives us a good launch point, but gives us an imprecise impact area. You need a radar for that. And very often these missiles -- say an Iranian test launch -- it's not necessarily flying within range of radars that

can see it and therefore are not giving a good impact prediction. But we do try to predict an impact based on the satellite information, and I will show you an example of that.

On the longer-range strategic launch, since our system was originally designed to report an ICBM/SLBM attack on North America, the strategic part of our system doesn't even bother to estimate the impact. It just says it's heading towards North America, "over to you, radar system," because the U.S. does have a radar system. So, if it's a strategic launch, it is more than likely they will just get reported as a large fan. Over the next 2, 3, 4 years, that will probably change as we go to a different type of satellite detection system.

As I say here, the quality and timeliness and so on is approximately the same as you would get if you were receiving the information in a U.S. unit. But it is true that the U.S. unit would get more elements of information than those seven or so that I show there. But what they do get in Russia -- or the allies for that matter -- we don't dumb it down, send it through a computer to make the time off by three minutes or anything like that. It's the same time reported to our allies as would be reported to U.S. units.

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It's easiest to show a slide like this rather than pick enemies and friends, so there is no hidden meaning here. But on

this simulated missile launch from Vandenberg into Texas, that's basically our theater event system report, and that's what it looks like. This is a picture we took off the display we used at the Y2K Center actually, and we used it for exercising the system and so on. The launch point that is shown there is as precise as we can give it.

What we don't tell the Russians or our allies is how precise that really is. Is it plus or minus 20 miles or plus or minus 20 yards? We don't give that information out. But we do say that what you see is what you get. That's the best we can do. The same with the azimuth and the same with the impact area. That's the best information we can come up with. We don't necessarily define how good we are. And how good we are varies with weather conditions and all sorts of other things, too.

Also, as we change from DSP to a system called Space-Based Infrared System High -- SBIRS-High as it's called -- basically through this decade, we will get much more precise. And I don't know now whether we will ever reveal the information about the accuracy of the system. Probably not. But this system can only get better in terms of the preciseness.

For an early warning center, this is really all you need. You know what country the launch came from. You know the direction it's going. You know whether it's going to land in

your country. And you know when it's going to hit. So, really, what more do you need as an early warning system?

Now, if the U.S. and Russia had a combined missile defense unit, say, in Arizona, or say, even on the receive end in Texas, they would also need cuing information, which is not in that message. But the warning center doesn't need cuing information; it can't even see cuing information. The fire control unit of the missile defense system needs cuing information. So, if we actually had a combined joint theater missile defense unit with the Russians, it's more than likely that we would both need this cuing information from external sources, such as satellites, that would cue the radar of the system.

And we have actually, in the past, offered the Russians what sometimes we call trajectory information. We actually offered it to them in 1992 and again in 1999. But that is somewhat different than the type of information that is required in a warning center. So, the elements of information I showed you earlier that are being provided to the warning center we think are adequate to do that mission.

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The Russians, in the negotiations, insisted on phasing in the center in terms of the operations, or in terms of what is reported I should say. And it ended up sort of complicated. For

example, at the Y2K Center, we didn't have time for this. Plus, since we were pretty much in the driver's seat -- it was our equipment, our site and everything else -- we said we will report all launches that occur worldwide of any missile that exceeds 500 kilometers in range. And the Russians objected to that. They wanted it more specific, more like this. We said we don't have time to mess with that; we're going to show you everything that happens.

And in fact, during the Y2K Center operation, we were showing them SCUD-B launches from Russian territory into Chechnya. But one of the reasons I think they don't like that is because their systems can't do anything -- they can't report worldwide launches and they can't report theater-class launches. So, they might have been somewhat perhaps embarrassed that they couldn't do it. But if we had our way, we would report all launches worldwide, wherever they occurred, whatever direction they were heading, that exceeded an arbitrary figure. And we picked 500. However, the Russians wanted us to march through this process.

As I said at the bottom, it's our intention to move to the final phase as quickly as possible, and also to take advantage of, under Phase 3, the third bullet, launches that either side believes could create an ambiguous situation. I hope that we take advantage of that and report what we want to report.

The original Russian proposal a few years before this -- actually, when we first talked about this -- had seven phases over seven years. And we sort of knocked that one down. But here is where we are.

Next slide.

As I mentioned, we did get money from Congress. There were some conditions. We are supposed to split the costs. But the Russian's provision of land and the building can be counted as part of the cost. So, the end result is they give land and we give money. Plus, we agreed to spend most of that $6 million on Russian subcontractors. And I will show you the building that we are talking about renovating to make this warning center.

The original agreement said, or the intention was, to have the JDEC operational within a year of the agreement, which was signed in June of 2001. So, last June we should have had the Center in operation, but things happened and we didn't. So, if we were to get clearance next month to start, we pretty much have to wait out the Russian winter before we start digging holes, and then we can start the renovation work and install equipment. So, it could be ready for testing as late as the end of next year. But we have a lot of things happening on the diplomatic side.

We would plan on sending 16 U.S. officers, or maybe 14 officers and a couple of NCO's, to the Center. This is not firmly settled yet, but the current thinking is we would send

them there on permanent duty for two years, and send them through Russian language training on the way. Then the operation would be around the clock, 24/7, and so on.

Next slide, please.

It's an old building that's going to require lots of work.

Next slide.

And that's just a general idea. We have more room than we need. All we need is that center wing on the right side, but the Russians gave us more space than we really needed. And we think they're thinking of expanding this to other missions.

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The airport is in the upper-left corner. If you've been to Moscow, you can see, relatively speaking, where it would be located. And the center of the map has the Embassy and Russian Government buildings and so on.

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It would be the first permanent U.S. joint military operation with Russia in the strategic arena.

Next slide. I'm running out of time; that's why I'm hurrying.

And the main issue holding us up is Russia so far refusing to exempt us from taxes and so on as we bring this equipment on. Even though it's our technical assistance, they

wanted to impose Moscow road taxes and all sorts of garbage. And basically, I think the MFA and MOD really didn't have complete control over the financial ministries, the tax ministries and so on. But based on talks that have occurred fairly recently, they are trying to come up with ways to overcome that. And we know that there are people in MFA and MOD who want this Center to happen.

That concludes my presentation. I'm sorry for rushing at the end. I guess we will have time for questions later. Thank you.

DR. ELAND: Ambassador Cooper.

AMBASSADOR HANK COOPER,

CHAIRMAN OF THE BOARD, HIGH FRONTIER

AMBASSADOR COOPER: I want to say thanks to Ivan and to Cato for hosting this meeting.

Also, I can't help but comment, after Phil's discussion, that things have progressed a lot in the last eight or nine years since I looked at this closely. In particular, I remember during the Gulf War helping to modify the Defense Support Program, which was developed as you all I'm sure know, to provide warning against long-range missiles out of the Soviet Union toward the United States. But we modified it almost in

real-time, during that six-month period that Saddam Hussein gave us to monitor the launches out of Iraq towards Saudi Arabia and Israel. Unfortunately, we didn't have any such network set up, so Ma Bell and long distance telephone was the way we provided warning to the Patriot units in the Gulf War. We've come a long way since then.

This is going to, I believe, sound like more of the same kind of discussion that Phil was giving you. Because, frankly, I strongly support the need for good early warning systems and also, and in fact more importantly, for survivable second strike deterrent forces. That's something that he didn't really say anything about, but I think it's the underlying strategic issue at risk when we begin talking about de-alerting and other measures that some have proposed to deal with the degraded warning systems of Russia.

Over 20 years ago, I was a member of the three-man team that assessed U.S. false alarms out in Colorado Springs caused by faulty computer hardware, software and various procedures. And we recommended fixes that were then implemented. Then, about five years ago, Boris Yeltsin, as we all know, energized his nuclear suitcase after a procedural breakdown between Russia's Ministry of Foreign Affairs and its Ministry of Defense when it didn't provide warning or information on the Norwegian launch of,

I believe it was, a Scout weather probe, and Russia's degraded warning system then prompted a false alarm.

The important thing to note about this is that the respective control systems in both of these cases -- and in fact in our case the false alarms were several -- in both sets of cases the control systems worked and there was no harmful response.

Frankly, I believe that as long as we are undefended and face potentially hostile nuclear powers, we will need alert, survivable, second strike nuclear forces, in which case there is little incentive for false alarms precipitating dangerous reactions. Most specifically, as you might have gathered from my derogatory comment earlier, I don't favor de-alerting. That is, removing from alert our strategic forces, whether it be in the case of the bombers earlier, in the 1990's, or whether it is as some have suggested in terms of removing warheads or taking Minuteman and our SLBM's off alert. I oppose this especially if it increases the vulnerability of our strategic systems.

And in particular, I did not favor the early 1990's de-alerting that occurred during the Bush administration of our bombers. Those bombers previously could have been launched for survival if there were an attack or a false alarm and then recalled for any other reason. That capability was an important hedge for the triad. That is, our ICBM's, SLBM's and bomber

forces. And I believe we still need to assure a viable triad. And to do that, we need to assure that we have survivable second strike forces.

Now the non-alert bombers are susceptible to attack in this country because they no longer stand alert. And we have lost an important, in my judgment, stabilizing feature of the earlier triad, to save money and, I suppose, to keep the Air Force happy so that they could use the bombers primarily for other purposes.

As the hedges and the forces are reduced, ICBM vulnerability then becomes a greater concern, and we increasingly depend on the submarine-launched ballistic missiles as our sole survivable second strike deterrent force. Now, defenses could provide a major stabilizing influence in this context by enhancing the survivability of our ICBM's and our bombers, as well as the American people, which is the focus primarily of the NMD argument today. And lost in the debate has been the importance of this issue of survivable second strike forces. And defenses can play an important role in readjusting that balance. In my judgment, continuing our vulnerability to even a single ballistic missile is more dangerous than the influence of deteriorating Russian early warning systems.

Note that the concern over early warning and false alarms stem from the Cold War's adversarial condition, which we

want to move beyond now. This is U.S. policy, as has been repeatedly enunciated by President Bush and many of his spokesmen. I would note that we don't worry about British or French missiles, insofar as I know anyway, and I don't think they worry about ours. So, early warning is not a serious consideration in our relationship with them, except as we together confront common threats.

In that context, I would welcome the role that viable, accurate warning systems can bring to the U.S.-Russian relationship, just as Phil has been discussing, and for others as well, especially to support joint missile defenses to counter the growing proliferation of ballistic missiles. And that is the common approach that would work not only with Russia, of course, but with our other allies and friends around the world.

I favor cooperative approaches to reassure all parties in possible crises that might bring their good faith into question -- the false alarms, that is. Such cooperative measures could significantly aid in improving the basic strategic relationship between the United States and Russia. And I see no reason why such systems and procedures cannot be made to work, and strengthen U.S. security interests.

As U.S. negotiator during the Reagan administration, I tabled proposals in Geneva that we and the Soviets cooperate in building and operating joint missile defenses, and that we would

of course include a warning function in this. Jay Keyworth, who was Ronald Reagan's Science Advisor, and others at the time, conceived on how we might do this from a technical and an operational perspective. This was at the height of the Cold War in the 1980's. If we could do it with the Soviet Union, we can surely do it with Russia. So, those who are concerned about our giving away secrets and so on I think can rest easy.

Boris Yeltsin said yes to these proposals, as this group I'm sure knows, in a January 31, 1992 speech at the United Nations. He proposed to build a global defense together, while reducing nuclear arms. So much for the argument that you can't have defenses and continue to reduce nuclear arms. We had high-level talks, that Phil referred to, the Ross-Mimedov talks, that were initiated toward that end and then dropped by the Clinton administration. The current high-level talks are seeking to revive efforts to move cooperatively beyond the Cold War's ABM Treaty, which blocks any effective defense.

Such efforts can build on the Y2K Joint Command Center experience in Colorado Springs and the current initiatives to create a Moscow Warning Center, all as part of building joint global defenses. And I would not rule out joint acquisition programs.

As the SDI Director, I proposed to use Russian rockets to launch our space defense satellites in 1992, and received

grief only from some U.S. industry folks who didn't like the idea of giving up that bit of the marketplace. I always would tell them to imagine, if we had cooperation with the Russians and we were doing this, there would be a lot more market for them in building the things to be launched than the market they would lose in launch capability.

And as someone said earlier they actually, I think, have better launch capability -- they certainly did at that time -- than we had. In any case, I encourage that we revive such thinking. So, my bottom line is favorable for joint warning, not just to help Russia fix their deteriorating warning systems, but in the context of building global defenses for the world community as Boris Yeltsin proposed in 1992. And I hope we are rapidly converging on that objective at the present time.

Thank you.

DR. ELAND: Geoff?

GEOFF FORDEN,

SENIOR RESEARCH ASSOCIATE, SECURITY STUDIES PROGRAM,

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DR. FORDEN: Thank you. I have a PowerPoint presentation. I guess it's strange that the academic is presenting the PowerPoint presentation today.

I want to limit my discussion to Russia's early warning and without involving the issue of missile defense and how it plays into the relationship between Russia and the United States. I think that's an important one, but I don't have anything more to add to that today.

However, currently the United States and Russia are still in a posture where we're maintaining missiles that could be launched in a few minutes' warning. And that facilitates what could be a dreadful catastrophe if there was a benign event misinterpreted by one or the other country's early warning systems. And I suspect it would most likely be misinterpreted by Russia's early warning system because of its degraded state.

In my talk I just want to discuss the recent evolution of Russia's satellite systems, and then several options additional to the JDEC that I believe have more of a practical effect for improving Russia's access to reassurance that they were not under attack. And that's really the key issue: that we want to provide Russia reassurance that they are not under attack, in case one of their systems, as it did in 1995, misinterprets a benign event as a precursor attack. Then I will talk briefly about how joint U.S. and Russian programs could be used in a multinational role, and in particular how it could be used in the India-Pakistan-China region, and how that shared

early warning system would benefit both those three countries and help improve the U.S.-Russian relationship.

The Soviet Union instigated two constellations of satellites to use for their early warning system. The first was a system that was in a highly elliptical orbit, that had its high point over North Europe, and looked at the United States at a very specific and unique vantage point. And that is it looked at the missile fields at a glancing angle. They also launched and continued to maintain until very recently geostationary early warning satellites.

And I show these two systems here. This is a view, looking down at the equator. This is the geostationary orbit. This is the highly elliptical orbit. This is looking at it from the Pole. The geostationary orbit looks like a circle then, and the highly elliptical orbit looks like that.

Both of those are positioned in this unique place where they can see the central part of the United States, and particularly where our ICBM fields are, at this glancing angle. So that if a missile is launched, say, from Malmstrom Air Force Base, it appears to both satellites, both the highly elliptical orbit satellite and the geo satellite, as if it was projected against the black background of space. That has significant implications for the required technology. It allows them to have a much lower technology that they can use for such a satellite,

because it doesn't have to eliminate a lot of the backgrounds that come from reflected sunlight off of clouds and so on.

But even looking at Malmstrom at this glancing angle still allows some naturally occurring background to be misidentified as a missile. In fact, in 1983, I believe it was, when their system was first launched, they had a missile alert because they were in a position very similar to here, looking at this point, and because the sun formed an angle between the missile base and the satellite position, they saw an increased cloud reflection. And in fact the person in charge of their early warning satellite earth terminal decided, even though it was recommended that he call an alert to higher levels, he decided that it was probably just the system had some turn-on problems. So, they became very worried about that and started to orbit the second system, the geostationary satellite system, so that if this one had an increased reflection from the sun, this view wouldn't.

Now, let me just show you, because I think it's instructive, to see what the satellite sees. Here is a movie, and what we are seeing is the view from a satellite, looking at a missile over Malmstrom Air Force Base. And now what you want to see is, from that position in its orbit, when that missile appears to be projected against the black background of space. So, from this part of its orbit over to about this part of its

orbit, you will see a very nice clear shot of that missile launch. This is the ground trace, if you can see it, of that system. And it has to be in a very well-defined region above the earth for that to happen.

So, when a Russian early warning satellite moves away from this position, you can tell that it stopped working. This is reproduced better in my paper, I'm afraid. What you see here are the ground traces. This is the United States, this is Northern Europe, and these are the ground traces of the different satellites as they fly over the earth. Again, this is the position that is most valuable to the Russians to look at the United States. And you can see that they have taken a great amount of trouble to make sure that all nine of these satellites line up over the same place, the same ground traces.

In 2001, if you look at all those early warning satellites -- and I'm afraid everything is washed out in this projection onto the screen -- but all of these traces have moved and been allowed to drift all over the earth, indicating that their early warning satellites are not functioning. In fact, if you plot the period of time that any of them see a satellite over Malmstrom Air Force Base that is projected against the background of space, which is when they function, you see great amounts of holes in them. And in fact, at most, there is 17 hours of coverage in any 24.

In fact, since I've made this plot, another one of their satellites has died and they've stopped station-keeping. And so this plot has presumably been further reduced. The light lines of this, which is shown in my paper, are not being reproduced on the screen very well. But what I'm plotting here is the longitude of the geostationary satellites as a function of time. So, the start of 1984 is right here, when they first started their system, and this is longitude. This corresponds to being over the mid-Atlantic. And that's the position where you see the United States at that glancing angle. It's obviously their highest priority orbit, and they're keeping it there to compensate for any inefficiencies or defects in their technology in their highly elliptical orbit.

In fact, when one of these satellites died, they moved another satellite that they have just recently placed in a different orbit to try out a different viewing angle to that position. Recently, in 2000, all of these have stopped functioning. So, there is no backup system in geostationary orbit today.

Now, I came into this project from a particular point of view; and that is, how would the United States allow Russia to develop a working system, or to reinstigate its system, which would allow it to have the greatest confidence that it was working? With all due respect to the JDEC -- I think it's a fine

program -- but it does not address Russia's confidence that it is not under attack.

What we need to do is somehow let them develop their own system, either fund the launches of their early warning satellites that they already have made and say that they cannot afford to put in orbit or we need to help them develop a more economical system that would use more advanced technologies that would allow them to get away from a minimum of nine satellites in orbit to something that would, say, require three geostationary satellites. Obviously, a more economical system of delivering early warning information.

In the first instance, we could fund a launch as a short-term fix to their early warning system for about $160 million. And that would provide them a 24-hour coverage that they would have total reliability on. Because it is their system that we are providing. It would not involve any transfer of U.S. technology or information, and especially would not transfer any information about the U.S. early warning system.

In a long-term project -- and we are funding the RAMOS Research Project -- which will have a substantial impact on Russia's early warning system, because one of the systems is testing a new way of filtering out reflected sunlight, and they could therefore abandon their need for these two complementary and expensive early warning satellite systems.

The third way the United States and Russia could improve each other's confidence that they both have reliable early warning systems would involve a multinational effort. And this would involve the India-Pakistan-China region. Both India and Pakistan are new nuclear powers. They are just developing their weapons. They have had a very limited number of tests -- which is a good thing. But because it has been very limited, they do not have the experience with nuclear safety devices that the United States or the Soviet Union/Russia have.

In particular, if they start deploying their nuclear weapons, then U.S. past experience has shown there are bound to be accidents, and that the probability of an accident increases as you start deploying a weapon system. So, we have had a whole panoply of nuclear accidents, but just two of them, to give you an example: In 1960, a nuclear-tipped BOMARC missile caught fire and burned and in fact melted the plutonium pit in the warhead. Again, luckily the United States had plenty of experience with making their weapons safe and there was no nuclear explosion on that.

Another time, and perhaps just as relevant for these new nuclear powers, is that the United States, in 1961, there was an accidental fire on a U.S. fighter that was on quick reaction alert, which had a nuclear air-to-air missile attached. And that missile was scorched and blistered. While being far less

destructive of an event than the BOMARC event, we have to ask ourselves: What would a new nuclear power who does not have the safety experience of the United States do? And would it result in a non-nuclear accident? If there was a nuclear explosion, how would India or Pakistan interpret a nuclear explosion on their territory?

These are bound to be at places that they consider militarily sensitive, because they have a nuclear weapon there. Therefore, that makes them militarily sensitive. So, for instance, if an Indian nuclear storage dump explodes, with maybe a kiloton yield, in the heat of the moment, are they going to say that was an accident, we didn't mean that, and certainly it was not an attack?

At this point, the United States and Russia could set up a joint early warning system that would share filtered data, much like the JDEC does, so that if there was a nuclear detonation, the center could share that information with India or Pakistan or China, and say there was no missile launched at you; let's take the time to investigate this further. It would also hopefully have a tendency to delay a retaliatory strike from India, if that's the country that had an accidental nuclear explosion.

It would also help the U.S. and Russia, because having a dedicated satellite, with technology that neither one of them

uses in their own early warning satellites, would allow them more freedom in exchanging information. And particularly, it would allow them to compare algorithms and prove to each other that each country's algorithms were up to the task of detecting missiles. And so, in that case, both the U.S. and Russia and the three countries in the region get a benefit from this system.

Thank you.

DR. ELAND: Okay, I think we will go right to questions here. Does anybody have a question they would like to ask? Please wait for the microphone, and please make your questions brief so that we can have plenty of time for other people to ask questions.

MR. BALSAM: John Balsam, with Synthesis Partners.

Dr. Cooper mentioned the very interesting proposals and perhaps some early groundwork on shared ballistic missile defense, which would include early warning and so forth. The strategy of course has changed very considerably in Russia since then. A lot of their industrial base, their MILSAT, military production capability, has degraded and so forth.

At the same time, commercial technology has come galloping along that would dramatically -- and I've seen some very interesting stuff on this -- that would greatly reduce the cost of getting up some of these missile defense systems that we would like to get up -- say Brilliant Pebbles, SBIRS, et cetera,

et cetera. There are a lot of shared, if you want to call it, technology churn across both of the civil and military applications.

Is there any obstacle today to, in a sense, doing cooperative programs with Russia for cooperative defense in space that would have a substantial military and commercial element to them? In other words, could you take the Yeltsin GPALS proposal of January 1992 and really do a number on it both militarily and commercially? And how fast could you do that?

AMBASSADOR COOPER: Was this a setup? Actually, in the 1992 time period I personally, and others, talked with senior Russians about doing just that with the technologies we were then exploring for a system called Brilliant Pebbles. I think the problem today is probably the same as the problem was then -- which is what you heard in the last panel -- which is an aversion to "weapons in space," which defensive interceptors are perceived to be.

The fact of the matter is that the Brilliant Pebbles capabilities were redundant with SBIRS Low -- what is now called SBIRS Low. And the reason we invented that program at the time -- called Brilliant Eyes then -- was because we knew it was redundant but that it was going to be necessary with the other components of a layered defense, and that we were going to have a big fight over the space-based interceptor component, because it

was a "weapon in space." And there are these political inhibitions -- not just the ABM Treaty, I might add -- but a lot of other concerns, as well.

But the fact of the matter is that the Brilliant Pebbles idea, which we believe could have been built in less than five years for $6 billion or $7 billion in 1991 dollars, it provided all the warning. It was a completely autonomous system. It didn't need DSP, it didn't need SBIRS Low, it didn't need the ground-based radars, all the rest of this stuff that is being built for the NMD system right now, because it carried a suite of sensors on board, as you say, now available, in many cases, in the commercial marketplace. That was not the case then.

It carried a computer which was the equivalent of a Cray-1 or Cray-2, that you could hold in your hand, which was the cutting edge of technology in those days. And that computer allowed you to compute where you were in orbit, where your neighbors were, the algorithms that your neighbors would use in computing the trajectory of missiles that were being seen and how the pebble, or the satellite, the interceptor, should maneuver into the path and determine which satellite had the best shot. All this was technically feasible 10 years ago.

And it went on the back burner even in the first Bush administration as a part of the deal that was cut with the Congress, the Missile Defense Act of 1991, that authorized a

ground-based site. And Sam Nunn extracted a price of moving Brilliant Pebbles, which was the lead in the architecture -- it was the first of the SDI programs to become a major defense acquisition program in the Pentagon -- move it out of that status and put it into back-burner technology demonstration activity. And then of course, when the Clinton administration came in, it was Les Aspin, and he took the "Stars" out of "Star Wars," and it killed the program entirely.

Regrettably, so far this current Bush administration has made no move to revive that. As you say, they are not exploiting what is readily available. They are not exploiting the fact that all of those sensors that we were developing in the early nineties were space qualified on a space mission called Clementine in 1994. So, this is not a hypothetical thing I'm talking about. The hardware is there to make it happen.

The real problem, John, is the politics. It's the politics. And it's far less expensive, far more capable a system, but you will never build it as long as you have the attitudes that were expressed in the last panel, which unfortunately I believe probably is pervasive in our Congress.

DR. ELAND: Any other questions? Yes, Eric?

QUESTION: You mentioned the necessity for us to have a second strike capability. I've been talking to the Chinese lately, and some of their most prominent spokesmen have argued to

me their need for a second strike capability now. I'm going to be going back, and I wonder if you would talk for a moment about how de minimis we might be about their same need for that second strike capability?

AMBASSADOR COOPER: Well, this is just my view. I will let Phil speak for the powers that be currently.

We wrestled a great deal on my watch with the so-called stability issues cast in terms of the Cold War models, first strike, second strike, and the ability to assure that you were not subject to a first strike. And the numbers game is an awkward one for China, because they have so few long-range missiles at the present time. With respect to Russia, we can get by the current impasse by simply noting that no defense that we will build in the near term could stop a massive strike from Russia. It's just simply not that capable.

In the long term it possibly could, but in the long term we would hope that maybe Russia evolves to a status like the U.K. or France, with whom we have no particular apprehension. Even though they have a few nuclear missiles that could obliterate cities in the United States, we are just not worried about that; and having a defense in the long run that could dominate Russia could make the whole world safer.

China, you can't make that argument for, because we indeed -- well, maybe this administration will say that it wants

to have a defense that won't defeat 20 ICBM's. I wouldn't have anything to do with such a thing myself. It's hard to pick what the right number is. In the early nineties, we picked the number that could be launched by then Russian submarine-launched ballistic missiles I believe it was, or maybe it was a battalion or something, or a single ICBM -- I don't remember -- a single battalion or regiment; I forget what they call it now -- but it was 200 RV's that we designed against. And we saw a very high kill probability against them.

Apparently everyone is talking about a few, and I think largely to skirt this issue that you're on. I don't see any honest way to skirt it. And I think that we just have to say it's in our interest to protect our people and China has to make its own decisions. I believe that if we move quickly to do this, that we will find that we discourage China from building a massive ballistic missile threat, because it won't be an effective capability against us. Much in the same way that I believe that will be a deterrent to the proliferation to so-called rogue states. And people are hesitant about what category you put China in, whether it's a rogue or not, but they're obviously helping the ones that we call the rogues -- as is Russia, unfortunately.

This is beating around the bush for your question. I don't see any easy way to duck it. If you're going to be honest

about the analysis that people -- and I used to call it the Glenn Kent analysis -- the two-sided game of stability, where one side goes first and then the second has to respond -- frankly, there were studies 10 years ago, where you saw, with three or more players, that those stability arguments changed somewhat, if you want to get into the detailed analytical end of it. But I don't think people think about it that way. And politically, I think this is a potent issue. I don't see any way to duck.

But I frankly believe that we would be better off by being straightforward with the Chinese, and saying, as this President has, that we are going to defend the country. And we don't encourage you to build more missiles, but you have to look after your own interests. We don't think it will be in your interest if we build the effective defenses that our technology now permits us to build. And since in the Cold War we could work on ways to work together, I wouldn't be opposed to talking to the Chinese about ways that there might be cooperation in dealing with this global threat.

QUESTION: You mean "cooperation" in the sense of what?

AMBASSADOR COOPER: I think we would be as careful with the Chinese as we were with the Soviets. Some of my right wing friends would be horrified, I guess, at what I'm saying, but I spent five years talking to those folks across the table, and I don't think I'm any softer now than the day I went in, in dealing

with them. As a matter of fact, holding the line with them I think had something to do with the way the Cold War ended. And I believe that hard-nosed and honest discussion with the Chinese could serve us very well on this.

And I don't really favor playing games. Maybe the Chinese would be fooled by it. Certainly the Russians never were. And I think they responded much more favorably to us in the context of an honest dialogue, where they knew or felt or believed that we were being straight with them.

DR. ELAND: Does anybody else want to answer that question?

MR. JAMISON: I probably better not make news on this today.

(Laughter.)

DR. ELAND: I have a question. We hear a lot about the deteriorating Russian early warning system. I have just tried, from a larger perspective, to put this threat in perspective. Ambassador Cooper mentioned that he thought a launch from a rogue state was more likely than an accidental launch from the Russians. And we hear about all these threats -- proliferation to rogue states, accidental launches from rogue states if they get their weapons and the missiles; we've got the accidental launches from the Russians.

I'm just wondering, how does this Russian early warning threat fit in, in severity, compared to other threats? What's the most likely threat to the U.S.? Is it this or is it a rogue state? I would just like to get our panelists commenting on the broader issue.

DR. FORDEN: I would like to just say that it's a real threat. The relative magnitude of that compared to an attack by a rogue state is hard to estimate, because I don't know how to estimate that. But, in 1995, we saw a situation where a benign event appeared to the Russian military like a real precursor attack -- the launch from an island off of Norway. It was flying the same trajectory that a Trident missile would have flown if it had been intended to explode a nuclear device at a high altitude and blind the Russian early warning radars in that area.

And the fact that they had a complete functional early warning satellite system that allowed them to reassure themselves that there had not been a major U.S. launch of nuclear missiles that was just lurking below the horizon I feel played an important role in Yeltsin's and the entire Russian military's decision that they were not under attack.

How often is some benign event going to appear like a nuclear attack? It's hard to say. It's happened in the United States. Ambassador Cooper investigated, I believe, two such incidents. We do everything we can to minimize that possibility,

but the fact that redundancy does not always reduce the likelihood of something happening -- and in fact redundancy can make something more likely to happen if the human and mechanical devices work just in the wrong way -- is not reassuring.

If the United States and Russia experience a period of increased political tensions, then the likelihood that such a benign event is misinterpreted has to increase.

DR. ELAND: Does anybody else want to answer that?

MR. JAMISON: That 1995 event did inform our discussions, especially internal discussions, as we thought about what we wanted out of this joint warning center. And I haven't said that much about it, but sort of in conjunction with negotiating the joint warning center we talked about expanding our prelaunch notification. And through both prelaunch notification, which is essentially just sort of a controlled, Internet-based Web site where we would post missile launches anywhere from 30 days to 24 hours in advance of both ballistic missiles, space-launched vehicles and sounding rockets, that, in and of itself, should prevent an incident like 1995 from occurring again.

And then part of the process we want to set up is making sure the governments, and the right people in the governments, were informed. And we actually informed the Russian

Government about this 1995 event. It went to MFA, and MFA never passed it to the MOD, and certainly not to the radar sites.

DR. ELAND: I just have one more thing. If you look at airplane accidents today, there is almost always a new reason that you have an airplane crash. And you can fix the previous one, but airlines are continuously flying and they find new ways of breaking down. Once you solve the rudder problem of one particular airplane, it's going to be the fuel tank of another that causes a crash. If you increase Russia's ability to use its own early warning system to verify that it's not under attack, you go to a large extent to eliminate the possibility of some new and unthought of benign event causing the situation to happen.

AMBASSADOR COOPER: Just one comment. At least I don't know of any sensor that doesn't create false signals at some time or other. As I recall when we first started with the Dewey Line and other things, didn't we mistake once the rising of the sun, or something like that -- I forget what it was -- as a launch? Was it the moon? And you gain experience in operating these systems that allows you to filter out the normal occurrences. I agree that you always worry about the one you haven't seen, and those are the ones that create the problems.

The point I was trying to make is that if your forces are survivable in the first instance -- and China's are, by the way -- the defense that we are talking about does not threaten

the survivability prelaunch, but it denies them the prize of Los Angeles and, frankly, I think we should -- but that dynamic can shift if we can change the name of the game. If we have a cooperative venture in which we are looking not so much at warning but as the events that occur around the world, and warning in the sense that it's a threat to whatever the alliance is, then the parties to that alliance, the problem diminishes considerably. And I frankly think that should be the challenge.

You didn't take the position -- I didn't know what your position was, Geoff, on the panel -- that we should be alert, and I set up a bit of a strawman. Because there are many in the technical community who believe that -- and they have their reasons for believing -- that because of this problem, that you can't predict the unpredictable and somebody might do something stupid; that the best thing to do is to take all the weapons off alert, and thereby make them vulnerable in one form or another. And I just think that's a terrible mistake. We lived with it throughout the Cold War, and I'm afraid we're stuck with living with this uncertainty for some time to come.

DR. FORDEN: In terms of de-alerting, I agree with you that it's a bad idea if you require verification. But I would like to see greater reductions in our nuclear forces, and I think President Bush has said that. If those reductions are unilateral, I have no problem. I certainly believe the United

States when it says it reduces things. But I think a nuclear reduction does help the international security.

DR. ELAND: Any other questions?

MR. MILLIKAN: Al Millikan, Washington Independent Writers.

Have all the past instances of false alerts for nuclear war, have they been fully explained? And I was wondering if any of you are aware, in Russia, have there been anything comparable to the significant number of -- well, what's happened in this country -- with United States Government and military personnel who claim to have had some kind of encounter with alien beings or vehicles, presumably from space, and they are seeking immunity to be able to share this more publicly? I'm wondering if any of you take these people seriously? And is that something that should be taken into consideration, either expanding into space or as far as putting off some kind of false alarm?

When I personally heard these men, they were very believable, as something real that happened to them, but it was also kind of scary to me that they all seemed to think that this was something not potentially dangerous, either, these encounters. They seemed to think this was something positive.

DR. ELAND: Why don't we just answer the first question: Have all these launches been explained thoroughly? Have they been thoroughly studied? And have all of them been

recorded so that we know what happened? You were mentioning that they were investigating airlines; I assume in something like this they pretty much know what happened in each instance.

MR. JAMISON: Well, Ambassador Cooper was obviously investigating the U.S. ones; and obviously the amount of information that they could write about that in the general public is limited. But I think a lot of that is known. For the Russian ones, I believe we have found two events so far. And we have tried to understand those the best we could from looking at the external signals that we can. For instance, just knowing the orbital status of Russia's early warning satellites at the time of the 1995 incident or the orbital positions of their satellites back in 1983, I believe it was, when there were some reports in the Washington Post, and trying to understand that and explain those from just the physical characteristics.

Of course, it would be not only nice but it would be very useful for both sides if they had increased transparencies about those accidents, just so that people can understand how complex organizations function when they are under periods of intense pressure just to plan to eliminate whatever we can the next time.

DR. ELAND: We had a question over here.

MR. RENNING: James Renning, Atlantic Council. I work on Russia a bit.

Anyone asking Congress to appropriate money to aid Russia to improve or restore their early warning system is going to get an interesting response on the Hill. Many people don't realize that the Russians' budget runs about $42 billion, if you adjust it for exchange rates. That's the whole federal budget. If you do a purchasing power parity of 4, $170 billion, with a total defense outlay in the $50 billion range. This is why they will need American aid in purchasing the technology.

Since the new budget is addressing the cold reality that their military aren't paid -- by proposing nearly a 60-percent raise in salaries -- there isn't going to be a great deal of latitude for any such assistance for them to cover this money, which I think they acknowledge must be done. I wanted to make that comment.

AMBASSADOR COOPER: I can be irresponsible; I'm not in the government anymore. I think what you have just described is the basis of a deal. I think it's in our interest for Russia to have good warning. With that, I agree with Geoff. But I wouldn't just go off and buy them a warning system. There is a quid pro quo in all of this. As I said in my comments, I would make this a part of the deal with building a global defense.

By the way, if I had my say, I would be pushing for the stuff that John Balsam was talking about; because inherent in a space system is the warning capability that you want, as well as

the defense. And it's far less expensive than what we are embarked on, all because of the political constraints on the prospects. That may be a bridge too far politically to take all that on at once, but I don't think for a moment that we don't have powerful leverage. The Russians surely want warning. I think we want them to have warning, too. But our demand ought to be we do it in the context of a global defense.

DR. ELAND: If they couldn't afford the early warning, how would they be able to afford to contribute to a global defense? Would you go over again with what you want them to contribute to that?

AMBASSADOR COOPER: On my watch I said, why don't we let you provide the launch capability, for example. They have very good launch capabilities. And I believe that there is some -- whatever you call it -- barter arrangements of that sort that can be exploited. They have very good technologies. As some of you may know, I paid to bring over a bunch of Russian scientists on my watch and set them up down in Albuquerque. They were building space reactors, nuclear reactors for space vehicles, technologies that we were not pursuing.

So, there are things that we can do to mutual benefit in this process. But I think the price, our price ought to be to them, that we do this together in the context of building the defense that we say we want, and I think we need. And I think,

in the long run, if we do that in a way that we don't threaten their prestige, they will come with us.

QUESTION: [Off microphone.]

MR. JAMISON: As part of the JDEC agreement, we did leave a discretionary proposal that if there was a phenomenology like that, reentering objects, spacecraft or whatever, each side had the option or actually were encouraged to report it, and if they knew something in advance, to bring it up at least within the JDEC, where we could talk to each other and we would each have contact with our military commands. It's not mandatory, though, in part because we were not sure exactly how good it would be at predicting and reporting everything that happened.

DR. ELAND: Any other questions?

QUESTION: A question for Mr. Jamison. The JDEC system that you described seems to be very straightforward. Are there still any technical issues that need to be resolved, or is it strictly the negotiations with the Russians that are setting the pace right now? And based on the way things have gone so far, when do you expect the system to be actually fully up and running?

MR. JAMISON: I predicted in the Vugraphs I was working on yesterday that by the end of 2002, if we were to resolve the diplomatic issues in the next month or two. There really aren't any technical issues as such. I mean, there are some operational

ones. We plan on doing a Joint Concept of Operation, which is sort of a military document. And we have actually started on that, but that hasn't been done. But no, there are not any major technical issues.

There are going to be some issues that come up in terms of actual renovation of the building, on who gets the contracts and that type of thing. But it essentially boils down to these diplomatic issues.

DR. ELAND: And if you look at those issues, it would seem that the Russians really don't want this as much as we do. Can we infer that? It seems like trivial things, talking about liability concerns or taxes and that sort of thing. And what we are talking about is an accidental nuclear war here, so can we infer that they are not that excited about it?

MR. JAMISON: Well, to the lawyers it has been important, because it carries over to other agreements, the CTR Agreement and so on, and they're worried about the precedent that would be set. But in the recent discussions that have occurred, the new administration has indicated its support for continuing to implement the JDEC agreement. The Russians have responded that they wanted to do so and they thought it was very important. So, I think they just haven't really got their arms around how to persuade other parts of the bureaucracy in Russia to accommodate

us, because we are pretty firm on not backing down on the tax and liability issues that are holding things up.

DR. ELAND: And that's because it affects other agreements?

MR. JAMISON: Yes. This is a $6 million agreement, and the CTR Agreement is $800 million or $900 million. And there are other agreements out there, the plutonium disposition and so on, so we don't want to set precedent with this agreement that might affect some of these others, or vice versa.

DR. FORDEN: Can I make a comment on that? The Russians I have talked to have indicated that they are not putting JDEC into any of their command-and-control loops or what have you. And so, in the sense that it would prevent an accidental nuclear war, it's not a relevant military issue. I mean, it's a good thing to have officers getting to know each other and it helps increase the transparency of early warning, but it does not address the issue of accidental nuclear war caused by false early warning, and I think people should realize that.

AMBASSADOR COOPER: So, you're saying that they wouldn't necessarily trust the data that we gave them, that we were trying to launch a nuclear war against them?

DR. FORDEN: Whether they trust it or not, who knows? But they definitely don't include it in their warmaking decisions, so it doesn't affect their military plans.

MR. JAMISON: I guess we've heard a slightly different opinion of that. And I think of course this thing has to evolve in practice, and we haven't done this before. But as a minimum, at least they have said they would have connectivity to their own national warning center. And it's hard to believe that if an event occurred that did cause confusion and there was some agreement within the JDEC about what happened, that that wouldn't carry considerable weight as it got reported. And maybe that's just what is needed at that point in time to keep the suitcase from being pulled out.

AMBASSADOR COOPER: There is a point in all of this that I don't think gets emphasized enough. I tried to in my talk. That is that having survivable forces is at the essence of weighting the consequences of a bad judgment on a false alarm. Russian survivable forces are in our interest, as is China's, I think, because then there is a bit more tolerance of a false alarm when it happens. And I think that has been an important attribute of the arms control policies of this country. That was what was behind the de-MIRVing arguments for silo-based missiles, for example. You removed the many-on-one prize, the many-at-a-single-blow kind of prize, from the equation so it

becomes more costly to attack and you encourage the ride-out option, if you will.

I noticed not too long ago that Admiral Meese, in his testimony, basically said that we do not have a launch on warning of under attack policy in this country -- capabilities perhaps, but that's not a policy. Apparently that's not Russia's policy either. And I think that's the important thing that should be an objective of our diplomacy and interactions in all of this. Because the false alarms will happen. I think I agree with Geoff on that. And this is a problem. We want the best warning systems you can get, but there will likely be surprises.

The DSP, one of the things that happens because of this is the thresholds are set very high. That is, you screen out a bunch of signals that you just don't even look at. And so when it came time, in the Gulf War, when we were looking at SCUD launches that we knew were going to happen and this was really war, you lower those thresholds, you are willing to accept false alarms under those conditions. We weren't talking about nuclear war, though, we were talking about dealing with the SCUD's. And that is an aspect of how all this is managed and has to be managed.

DR. FORDEN: The current situation in Russia, while the United States -- and I believe it can ride out a first strike; we still have a credible second strike -- the current situation in

Russia is very different. They don't send their missile-carrying subs to sea nearly enough as they should, as I would like them to.

AMBASSADOR COOPER: No. Unfortunately, at this point, it's the mobile ICBM's.

DR. FORDEN: They do deploy mobile ICBM's, but a lot of the time they stay in garrison. And because of the proliferation issue, I'm glad to see them staying in garrison for that. I'm troubled because of the nuclear stability issue. Russians are also very worried about U.S. high-precision conventional munitions, and attacking their ICBM silos, at least. So, in the current situation, I can believe that Russia will be very worried about having a survivable second strike capability. And if the political situation changes, I believe that they could very easily go to a launch on warning posture, if they're not there now.

DR. ELAND: Okay, I think that's about all the time we have. I would like to thank our panelists on both panels for excellent presentations. And I would also like to thank our conference department for doing a great job in putting on the conference. Julie Johnson, Megan Brumleve, Christie Raniszewski, and Laura Major were the people who helped out there.

I would also like to invite you to a lunch upstairs in the Wintergarden. Thanks for coming.

(Applause.)

(Whereupon, the Cato Institute Conference was concluded.)