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Missile Defense Policy and Arms Control Issues

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(Slide 1, please-- title and identification.)

I am delighted to be here. Thanks Julian (Davidson). Thanks everybody. We can go on.

(Slide 2, please.)

I'm supposed to talk about missile defense policy and arms control issues, but of course this policy doesn't exist in a vacuum. It has to take into account our goals and the available means. And our threats and the goals are broader than the National Missile Defense program. We have a whole lot of other national security problems and they require budget and they interact with the missile defense question.

There are other options. Cooperative threat reduction such as we have under way with Russia in order to secure nuclear materials as best we can. And arms control instruments in the past have also been options. And there's also deterrence. We shouldn't sell deterrence short-- either deterrence against building threats or deterrence against using threats. And if you think that these are difficult countries to deal with, run by people who don't have the welfare of the population at heart, look back at the Soviet Union during the 1960s and 70s.

(Slide 3, please.)

As you heard, and you know, Scuds and their equivalent are ubiquitous. Their accuracy is poor and they have almost zero effectiveness when armed with high explosive. The accuracy can be much improved by GPS guidance which is coming in and will be quite common. Of course, we will be jamming GPS. There are BW and CW payloads.

BW (biological weapons) are of strategic importance, CW is not. We shouldn't just accept that somebody might use BW or CW. These are banned. Almost all countries on Earth have agreed not to use them. If they use them, not only should there be instant response but also the community of nations should rise up against them. And we shouldn't act as if use of BW or CW is something that will be acceptable.

(Slide 4, please.)

Theater Missile Defense (TMD), as you know, is now based hit-to-kill interceptors beginning with the PAC-3 and extending to THAAD and the Navy Theater Wide which won't be deployed until the year 2007 or 2008. And yet, of course, we're supposed to deploy a National Missile Defense either in 2003 or 2005; it doesn't seem likely. But none of these is going to be able to handle bomblets released on ascent. And if, contrary to their undertakings, nations want to use biological warfare they are not going to send over a unitary payload of hundreds of kilograms of anthrax. They're going to divide it up into bomblets on ascent simply because of military effectiveness, not because of countermeasures to a Ballistic Missile Defense system. TMD is, in principle, permitted under the ABM Treaty and I'm not going to talk further about it. I'm going to concentrate on NMD.

(Slide 5, please.)

I've been working since 1950 in the national security area, developing nuclear weapons and means of testing them at Los Alamos. And then a couple of years later, beginning in 1953, working on air defense and missile defense before there were actually intercontinental missiles. And then for the President's Science Advisory Committee I was through Nike Zeus, Safeguards, the SDI after the PSAC, and now we have the current NMD proposal. We do have the constraints of the 1972 U.S. Soviet-ABM Treaty.

Ambassador Smith is going to tell you much about about arms control and I agree with most of what he has to say.

(Slide 6, please.)

One of the problems in all of these programs is its honesty. By the time you get honest engineers and honest politicians together, and honest voters, they compromise too much and you have a whole lot of dishonesty. And so what you see for the NMD is the goal to counter these rogue nation's four or five maybe ICBM warheads with unheard of reliability. The required reliability and effectiveness of the system are classified; but if they weren't, we would laugh to hear what the requirement is. Of course we don't have to defend 100% in order to deter use, especially against the few warheads which have no chance of destroying retaliatory capability. And you heard from Bill Schneider that the cruise missile threat is under-appreciated. And also the countermeasures. Now these are not threat-of-the-day countermeasures. These are countermeasures I've been publishing since 1968 and that we've all know about since 1965. These are countermeasures that any country that has the capability to build an ICBM is going to use either for military effectiveness-- the bomblets-- or the enclosing balloon to handle the hit-to-kill interceptor, an option which was available to them in the days of nuclear armed intercept.

But the big threat really from all these countries is cargo ships with cruise missiles that they may have bought from others, launched from a hundred kilometers, not from 10,000 kilometers, which will have much better accuracy payload and flexibility. The ICBMs do have these easy countermeasures we have already mentioned.
(Slide 7, please.)

And here was the Rumsfeld Commission. I'll go quickly. The potential ICBM threat from the rogue nations so-called; a few crude inaccurate missiles and specifically the more feasible and earlier threat, the ship launched short-range cruise and ballistic missile against U.S. coastal cities; and explicitly we did not consider defense or its effectiveness against any of these threats.
(Slide 8, please.)

The ABM Treaty bans ABM systems against strategic ballistic missiles for defense of the territory, and it also bans sea-based, space-based, or mobile ABM systems, that's also against strategic ballistic missiles. But in no way does it inhibit U.S. defenses against short-range missile threats to our coastal cities-- either ballistic missiles or cruise missiles. The fact that we don't have any such defenses is our fault. It's not an impediment of the ABM Treaty.
(Slide 9, please.)

The NMD as is proposed won't handle even the North Korean ICBM threat. And as I'm standing here I tell you that if they deploy those missiles-- the Taepo Dong II, or whatever, and they want to use BW, it's going to have bomblets released on ascent and it's going to have an enclosing balloon for the RV. Not that we have intelligence on that. If we did I couldn't tell you.

One of the main points that the Rumsfeld Commission was that we should look not just at outputs in which our intelligence is scanty, but at inputs and what is the capability of the current set of technologists the world over to do these jobs.

We should start over. That doesn't mean we should lose time. In fact we will gain time if we start over on the NMD. We should start over with hit-to-kill on the ICBM booster. We can launch these interceptors from 1000 kilometers east, west, or north of North Korea from military cargo ships. Not from Aegis cruisers. Not because those aren't good ships. But it'll save money to take a special ship, take it out of the rusting inventory and equip it with interceptors, no radar, launch on DSP indication. Or there is the opportunity for a U.S.-Russian joint test range south of Vladivostok. There is a strip of land, as you'll see, that abuts North Korea. We should launch and vector on DSP data; home on the booster flame plus the hard body lead-ahead so we don't kill the flame. And the hit-to-kill interceptor should have 8 kilometers per second more or less burn out speed with a 10-g average acceleration, something which is really easy to do compared with 100-g and 400-g interceptors we had in the 1960s.
(Slide 10, please.)

Of course we have to negotiate. Looking ahead, vs. Iran or Iraq we would have to negotiate interceptor basing first in Turkey. Iraq is a small country. You'll see, bases in Turkey will handle this very well. Some of these other countries would help if ICBM threats emerged there. But this would be incremental defense. We would only do it as necessary. This still doesn't handle BW terrorism or the short-range ship launch but it does counter the threat that is identified as the reason that we do the NMD. NMD is also characterized invariably as having "some capability against accidental or unauthorized Russian or Chinese launch". In fact, my own view of the purpose of NMD is that it's an anti-Chinese system. And that's

why for 20 deployed interceptors we plan to build 75 interceptors. And of course nobody believes that we are going to have only 20 deployed anyhow.

We would need to agree with Russia and maybe with the other parties to the ABM Treaty, on the specific systems to be deployed. That's what I propose rather than on general amendments to the ABM Treaty. I think this agreement would be duck soup if the Russians had a part in the system. And the Russians can perfectly well build this kind of interceptor. So why not let them build some of them, deploy them south of Vladivostok, while we deploy our own on our military cargo ships in that area in the Japan basin. We could do joint work on these things so we can learn from the Russians. No doubt they could learn something from us as well.

(Slide 11, please.)

Here are some calculations which I will show you. But here is the outline of the system. If you have an ICBM that burns out in 250 seconds at a typical velocity with 3 g average then it goes at half that speed-- 3 1/2 kilometers per second times 250 seconds-- it goes about 800 kilometers during its powered flight. The high thrust interceptor goes to a similar speed and kilometers per second-- maybe 8 G on the average for 100 seconds, or whatever. And it goes a long ways too. During its power flight it doesn't go very far. But in the 100 seconds after its powered flight it goes 800 kilometers. And so we have a more than 800 kilometer radius footprint and much more if the interceptor is launched from downrange.

(Slide 12, please.)

Can we use such a system based in Japan against North Korean launches of theater missiles? Probably not. In fact boost-phase theater missile defense is more difficult than boost-phase national missile defense. The No-Dong boost time is much shorter than that of a three-stage missile. Is it useful as sea-based theater missile defense to protect Japan from North Korean launches? Maybe. I haven't done those calculations but I think people should do them. Can the sea-based Boost-Phase Intercept system be deployed for theater missile defense without amendment or agreement under the ABM Treaty? Probably. I don't see why not. That's why we have other kinds of theater missile defense. So let's go on.

(Slide 13, please.)

Here is the map of the North Korean area and some missiles which are being launched from North Korea a few years hence if they are not deterred. First of all, they'll be deterred with some probability from building these things. Although I remember the cartoon, which I didn't reproduce here, which says "The test was a success. More goodies are coming. Let's get the cardboard in before it rains." North Korean missiles, as the North Koreans are quick to admit, are built at least in large part to get foreign exchange. Who knows when they will decide there are better ways for doing this.

Here we have North Korea. Here's Vladivostok up here and Japan over here. Here are missiles launched from this North Korean launch site (North Korea goes all the way over there and all the way up to there) against Washington, Chicago, San Francisco, and Honolulu. All of those could be caught by interceptors 8 1/2 kilometers per second interceptor 100 second burn time based at Vladivostok. Even easier from south of Vladivostok. And obviously in the Japan basin we could take care of all of them.

(Slide 14, please.)

Here are some calculations. I'll take a minute to say what's going on. Here was the North Korean launch site from the southern part of North Korea. 150 kilometers is the point of launch. So 550 kilometers north is Vladivostok. Here is the trajectory of an ICBM 250 seconds after launch. It has gone about 450 kilometers. Its average acceleration is a little higher than that I figured. Here is 200 seconds after launch. These are 5 second intervals. Here's where it is 10 seconds before burnout. Here is the interceptor 50 seconds after launch, 100 seconds after launch. Burnout is 100 seconds after ground-based interceptor launch. But if I launch my interceptor 50 seconds after the ICBM was launched with DSP warning and identification of the rough direction of the trajectory, then I can get another 400 kilometers over here. But you can see that I could have launched them way over here and still been able to conduct boost-phase intercept on the second or third stage.

(Slide 15, please.)

Here is a ground trace of the Washington, Chicago, wherever, San Francisco, Honolulu. I must tell you that the total population of Hawaii and Alaska is 600,000 people. And if I'm incrementally deploying protection either in scope of effectiveness, I'm not going to defend those places first. Now that's the en-

engineering point of view. I think that ought to be the political point of view, too, because they are also eminently vulnerable to sea-based attack. Let's get real.
(Slide 16, please).

You've already seen this in the color picture.
(Slide 17, please.)

And here are the flight dynamic characteristics of the interceptor. So here is acceleration; first stage burnout; second stage burnout, maximum of about 12 g's there; third stage burnout, rather high acceleration there. That's how it is with three stage missiles. That's probably how it was with the Taepo Dong-I.
(Slide 18, please.) ****(Slide 19 is not used.)****

Here are some of the advantages over the mid-course hit-to-kill National Missile Defense. Not vulnerable to simple countermeasures. The hit precision required is much less demanding. The target is killed if it is hit almost anywhere. You can observe the target destruction maybe via DSP but you could also deploy for instance a THAAD for this kind of operation. Or for that matter unmanned air vehicles operating from the ship at 60 kilofeet or so would do a great job looking out at these ICBMs in boost-phase. And the sensors required for target homing are much simpler. Don't have to be longwave infrared. Could be shortwave or visible.
(Slide 20, please.)

Naturally we're not to catch this thing just in the last hundredth of a second before burnout. And if you catch it 10 seconds before burnout it turns out that there is a 5000 kilometer shortfall, and so you don't get to Canada. It shortfalls up here someplace where there are hardly any people and this happens to be in no country at all.
****(Slide 21 shows the relationship between range shortfall and burn time.)****
(Slide 22, please.)

Now the more difficult problem. Here we have Turkey. Here we have Iraq, and then its much bigger neighbor Iran. Well, from anyplace in Iraq a launch to Washington or San Francisco or Honolulu can easily be caught by interceptors which are launched from Turkey. From Iran if you deploy in this troubled region of Russia between the Black Sea and the Caspian Sea. It's not all Chechnya but it's not so much fun in much of that territory. Or for the eastern launches, Russia over here or Kazakhstan over here, or Uzbekistan would be a good place. Or for the southern Iran launch sites the Gulf of Oman. But it's awhile before we have the threats from Iran in my opinion.

And just for the future, and I'm glad that I'll be able to get these other slides posted on the Website or on a modified CD, you can find a lot of my papers at <http://www.fas.org/rlg>.
(On Slide 23.)

I'd just like to mention one thing here. When we look at the so called massive penetration by PRC of the U.S. nuclear and defense structure, I don't think that the Cox Report really is in a class with the Rumsfeld Commission Report. I think that it is a severely inflated threat. My friend Bill Schneider with whom I've worked very closely over the last year or so and for whom I have great respect, I think has suspended his analytical judgment in criticizing the Russians and the Chinese about being unable to stem proliferation. Because if we look at the U.S. government's inability to counter what Hughes and Loral did in talking to their Chinese partners (not that, in my opinion, it helped the Chinese a lot) you can say exactly the same thing. You know, the U.S. government was unable to keep our missile or space contractors from giving information to the Chinese which of course is unclassified and the Chinese have no bar to further transmitting to anybody that they want. This sort of thing happens.

The Rumsfeld Commission Report, in fact, indicated that it is the general evolution of technology that makes the threat much more severe. It makes it possible for people to do these things more quickly.

If you look at the North Korean development of the No Dong, it's really quite a good job. It seems to be a rather modern missile compared with a lot of the things that we built which stem from the 1960s and 1970s. And that's the way the world is going. So if we are going to protect ourselves against these threats we either have to defend or we have to take very seriously deterrence or other measures to keep these people from doing things that are threats to the rest of the world. One of these measures is arms control.

And let's take seriously the commitments that people make, and the BW and CW Convention and hold them to it.

I too would be glad to take questions or comments. Thank you.

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