

MEMORANDUM FOR: DDCI:

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Attached are some additional unclassified materials on the subject Soviet strategic defense efforts. Included are the unclassified Q's and A's from our joint Congressional appearance as well as a presentation that I made at an unclassified gathering.

*Larry*

Lawrence K. Gershwin

Date 4 November 1986

There has not been a dramatic change in their efforts or our reporting of it, but we stood back a little. We have a better appreciation for their mobile ICBM efforts than we had several years ago, but we had recognized that those efforts were in progress, it is just more vivid and we can see the implications somewhat better.

The potential the Soviets have for offensive force expansion, for ABM deployments that are widespread, those pictures are really about the same as they have been for several years in terms of our understanding.

We have been able this year to conclude that they are increasing the resources in their strategic forces compared to what they were actually spending for them in the last few years, but that was not a sudden Soviet decision, but it is rather the result of something they had evidently planned to do for a number of years.

Senator WARNER. In substance it is a steady upward curve?

Mr. GERSHWIN. Yes.

Senator WARNER. Not dramatic?

Mr. GERSHWIN. Yes.

A hallmark of the Soviet effort is that they very steadily move along on a broad spectrum of their force developments year after year. What we are witnessing is essentially a continuation of that.

It is dramatic in the sense that there is a lot going on, but there is nothing startling or new about it in terms of the impact on our understanding.

Senator WARNER. The question of leaks I addressed in my opening comments and I would like now to more specifically express my concerns.

One revelation in a recent Washington Times article yesterday was the allegation, and I quote:

The estimate says that the Soviet Union is likely to deploy a nationwide mobile antiballistic defense system in 1986, according to one official.

Your testimony, while noting the potential for such development and a deserved level of concern we should have here in the United States, does not address the likelihood of a specific deployment date.

Could you elaborate on that because that particular subject is so intertwined in the debate on SDI and also the work in the arms control arena.

Mr. GERSHWIN. Senator Warner, we have in our national estimates recognized for a number of years certainly the Soviet potential for ABM deployment. We have represented that in what amounts to a warning of concern.

We have very strongly noted their potential, watched it very carefully, and attempted to evaluate the implications, how fast it could be installed. But at no time have we judged that it is "likely" that the Soviets would in fact move out to such a deployment in the near term.

We have evaluated that by the early 1990's, based on our understanding of where the Soviets are, they could have in place a fairly large ABM deployment, but that is not a prediction that it is in fact what is taking place.

The Soviets have provided themselves with an option, carefully provided for an option to be

to, for one reason or another or choose to for reasons of strategic defense.

How large such a deployment would be we really don't know. We can estimate various sizes, but we can't argue, for instance, that it would necessarily be 3,000 or any other number and as for how soon it could be, we have not predicted it would take place immediately.

The Soviets could, in our view, move out to such a thing in the next few years. They could, but we cannot say that they will, and in no way did we ever estimate that they would in fact do this next year.

Senator WARNER. One of the more interesting elements of your testimony today was the presentation of projected growth in the number of warheads in the Soviet intercontinental attack forces under the various assumptions.

Do these estimates reflect your best judgment of what will happen under certain arms control regimes, the options the Soviets could exercise, or other factors?

That will be my last question, Mr. Chairman.

Mr. GERSHWIN. To answer this question, I may need a few minutes because it is a fairly complicated subject and I think it is a very critical subject. We have looked at the Soviet force structure within SALT II constraints such as number of MIRVed missiles while allowing for the fact that their current number of nuclear delivery vehicles today is in the neighborhood of 2,500, which is actually higher than the SALT II Treaty, itself, would allow for.

Senator STEVENS. Pardon me, Mr. Gershwin. You are referring to the figure 5 attached to your statement?

Mr. GERSHWIN. Yes.

Senator STEVENS. Thank you.

Mr. GERSHWIN. What we have seen is that the Soviets in fact, as I noted in the testimony, are increasing the number of warheads in this force and within the types of limitations that SALT II imposes, the Soviets would still by 1990 certainly have, in our view, over 12,000 warheads.

In fact, although not shown on the chart, within SALT II limits they could have more warheads than that under different assumptions. There are other elements of their forces for which they could increase the number of warheads.

So, even the number of about 12,000 we have shown here is not necessarily the precise number the Soviets would have, but that is our estimate of where we think they will be by 1990.

If they were to expand beyond arms control right away, starting next year, which is what these other two figures show, it does not mean necessarily they will go up to these kinds of numbers, but these are potentials for expansion.

These are from our looking at the same programs we see they are undergoing right now, the same programs contributing to the increase under SALT II could increase even higher. This would come from several actions.

One, in some cases the Soviets might not necessarily retire some of their older systems as quickly as they might under SALT II. Some missiles, for instance, might be retained longer, although in fact the Soviets are in the process of retiring a lot of missiles be-

Mr. GERSHWIN. I want to make a cautionary statement that the billion-dollars-a-year estimate is an estimate based on our understanding of their laser program alone.

Senator D'AMATO. Just the laser program?

Mr. GERSHWIN. The laser program. It does not include their efforts in particle beam, radiofrequency weapons, ground-based ABM, and conventional type ABM, which is a substantial effort.

Senator D'AMATO. How long has that effort been undertaken?

Mr. GERSHWIN. Certainly much of the laser program goes back to the 1960's, shortly after the laser was invented. The Soviets recognized in the sixties the possibility that lasers could have application to ballistic missile defense. They had a quick recognition of that.

The particle beam weapon research certainly goes back into the early 1970's.

The radiofrequency weapon research goes back to the 1970's.

On the conventional ABM effort the Soviets go back to the beginning of essentially the nuclear age practically.

The Soviets were actively involved in antiballistic missile research and development in the late fifties and early sixties. They have had many different attempts at it, some of that leading to, in fact, the Moscow ABM system that the Soviets deployed which was constrained by the 1972 ABM Treaty.

But the Soviets interest in strategic defense goes back to the beginning of Soviet military efforts. Interest in ballistic missile defense was from the beginning of the missile era.

The more exotic technologies they are looking at, the Soviets have recognized that potential and have actively been working on those programs right along.

Senator D'AMATO. These are not programs they have raised objection to our undertaking?

Mr. GERSHWIN. Yes, they have essentially objected to our pursuing the options that the United States has described, for the SDI program. For those types of research efforts the Soviets themselves have a very active research program of their own. That is not simply pure research.

Certainly we can look at the laser programs and recognize the attempt to develop weapons out of the program as part of the effort. It is not just an offshoot, but focused on that objective.

Senator D'AMATO. Is it possible for you to give us a description in terms of what kind of weapon systems they are attempting to develop vis-a-vis the laser?

Mr. GERSHWIN. In the testimony what I covered was the fact that they have a lot of effort that we can recognize for ground-based high-energy lasers. We expect to see some of that tested in a feasibility test sometime in this decade through what they have in existence at Saryshagan. That is happening now.

Senator D'AMATO. What is the gap—let us focus in on lasers—the gap that might exist between the United States and Soviets on Soviet laser systems they are going to undertake and test?

Mr. GERSHWIN. Let me comment in this way. The Soviets are pursuing some areas in high-energy lasers that we do not in this country pursue and vice versa.

So, the programs don't match up one for one. We and they both work on some similar types of high-energy lasers with potential for anti-satellite, or whatever.

Some Soviet efforts are in areas that we in this country are not pursuing or have worked on and left for one reason or another.

One thing is evident. That is, the Soviets will in fact work on any area we appear to be making progress in because they themselves view the potential for the United States to do better than they can. They simply cannot afford, from their point of view, to have us pursuing some high-energy laser technology that they themselves were not able to do at that time, they have to pick it up from now on.

But they will continue to work on the areas they have been doing as well.

Senator D'AMATO. Thank you very much, Mr. Gershwin.

Thank you, Mr. Chairman.

Senator STEVENS. Thank you.

Now, gentlemen, I don't know which one of us is next.

Senator LEVIN?

Senator LEVIN. Thank you, Mr. Chairman.

You have indicated that there is some uncertainty as to whether or not the SS-X-25 represents a new missile at this point.

Do you think those uncertainties will be resolved?

Mr. GERSHWIN. I don't recall indicating that.

Senator LEVIN. I thought I heard you indicate it may be a violation?

Mr. GERSHWIN. That was in reference to a question as to whether the new missiles that had not yet been flight tested would or would not pose a violation. The uncertainty was that before a missile is flight tested, one can speculate about whether or not it will violate the Treaty, but the proof is in the demonstration test results and comparison of those with characteristics that we already have in hand.

Senator LEVIN. Has the SS-X-25 been flight tested?

Mr. GERSHWIN. Yes, it has been flight tested since 1983.

Senator LEVIN. There is no uncertainty in your mind about that?

Mr. GERSHWIN. The SS-X-25 has been going through a whole series of flight tests. The Soviets have been building bases for deployment of this missile. It is clear that that is a new missile and we have been involved heavily, of course, in the compliance concern on that missile.

Senator LEVIN. I misunderstood you on that. You testified maybe 10 minutes ago about one type of restraint that SALT II places on the Soviet Union. You gave us an example of that, I believe, a little earlier this morning.

You also acknowledged, in response to Senator Glenn's testimony that the SALT limit of 10 warheads restrains the Soviets from putting up to 30 warheads on their SS-18; is that correct?

Mr. GERSHWIN. It is certainly correct the Soviets could not put 30 warheads on a heavy ICBM under the limitation where they could only have ten without our detecting it.

Senator LEVIN. They have lived up to the ten limit?

Mr. GERSHWIN. I would rather not get into that one.

Senator LEVIN. You mean you cannot tell the public whether or not they have lived up to the 10 limit or not?

Mr. GERSHWIN. It is a difficult problem because, as I think the public record—

Senator LEVIN. Have we filed claim of violation of 10?

Mr. GERSHWIN. Let me elaborate. At the time the treaty was signed there was concern at that time with the payload capability of the SS-18. There was much discussion between the United States and Soviet Union about that payload capability. We and they agreed to put in the treaty that that system would not be deployed with more than 10 warheads.

What I am saying is that the reason for that concern in 1979 was the fact that the heavy ICBM was a large payload capability that in many people's concerns could exceed 10. That was the reason that was put in the treaty.

Senator LEVIN. Have we filed a treaty violation that they have exceeded a limit of 10?

Mr. GERSHWIN. Not to my knowledge.

Senator LEVIN. Is it to our advantage that they be limited to 10? Do we care if they are limited to 10?

Mr. GERSHWIN. It depends on the considerations of what else—

Senator LEVIN. In your view?

Mr. GERSHWIN. I really don't have an independent view on that.

Senator LEVIN. You gave us a chart showing the prospect of the modernization program.

Aren't we better off with their being limited to 10 warheads?

Mr. GERSHWIN. As compared to?

Senator LEVIN. Twelve.

Mr. GERSHWIN. It would be marginally more to our advantage if it were 10 than if it were 12.

Senator LEVIN. How about 14?

Mr. GERSHWIN. Yes.

Senator LEVIN. How about 16?

Mr. GERSHWIN. Yes.

Senator LEVIN. Is it to our advantage that there be a fractionation limit of 10?

Mr. GERSHWIN. It would be to our advantage if that limit were actually what they had.

Senator LEVIN. Have we claimed that they have violated the treaty?

Mr. GERSHWIN. No, we have not as far as I know.

Senator LEVIN. Assuming they have lived up to that limit, is it to our advantage?

Mr. GERSHWIN. Assuming they have lived up to that limit on that particular issue, it is clearly to our advantage.

Senator LEVIN. SALT II may give us an advantage in that area?

Mr. GERSHWIN. It may.

Senator LEVIN. Is the 1,200 MIRV limit to our advantage?

Mr. GERSHWIN. The Soviets have not exceeded that limit.

Senator LEVIN. Is it to our advantage that they not exceed it?

Mr. GERSHWIN. The questions are really net questions because it depends on what the United States would do otherwise and what the Soviets might do.

Senator LEVIN. Are we better off with their having 1,200 MIRVed missiles or less?

Mr. GERSHWIN. All other things being equal, that would obviously be to our advantage.

Mr. GATES. That is a difficult area for us because you are asking us to net out a consideration that really is up to the President and the Congress.

Senator LEVIN. Let me be more specific. The Soviets are currently building two new types of submarines, the Typhoon and the Delta-IV. Recent reports indicate that four more of each class are now under consideration.

Now, under the SALT II limit of 1,200 MIRVed missile limit, is it not true that the Soviets will be forced to dismantle the relatively new Delta-III submarines if they build those other submarines?

Mr. GATES. We did not report that those numbers were correct. Senator LEVIN. It has been reported those numbers are correct.

Mr. GATES. It has been reported, but it has not been reported by us.

Senator LEVIN. Are you able to report?

Mr. GATES. Those numbers are not necessarily correct.

Senator LEVIN. If those numbers are correct?

Mr. GATES. If those numbers were correct and the Soviets were constrained by the 1,200 MIRVed missile limit, then at some point in that process of deployment of additional submarines they would have to retire some of their earlier MIRVed missile submarines.

Senator LEVIN. Is it fair to say that SALT II puts constraints on Soviet growth and our growth? Is that a fair statement?

Mr. GATES. It potentially puts constraints if the Soviets were in fact planning to grow beyond that. It is not clear that they are planning to go beyond those numbers in the near term.

Senator LEVIN. Does it not put a limit on Soviet growth?

Mr. GATES. You are saying, my gosh, maybe they won't grow above that anyway. They can't grow above that, if they comply with the numbers. If they comply, they cannot.

Senator LEVIN. Is it not true that those numbers do place limits on Soviet growth; that is, the outward bound of their growth?

Mr. GATES. If they were to comply.

Senator STEVENS. Your time is up, Senator.

Senator BINGAMAN?

Senator BINGAMAN. Thank you, Mr. Chairman.

Let me ask Dr. Gershwin about some of the directed energy, hypervelocity kinetic energy weapons you discuss on page 8 of your testimony.

I gather you are saying there that it is your best estimate that the Soviets could not have an operational system of a ground-based laser until after the year 2000; is that right?

Mr. GERSHWIN. For ballistic missile defense, that is our best estimate, we expect the Soviets to test the feasibility of a ground-based laser to do that during this decade, but from a feasibility test to an operational deployment of the same is a long road.

Senator BINGAMAN. Let me go back to your expectation that they will test it in this decade.

Mr. GERSHWIN. I can't really get into the full reasoning why we have concluded that.

As I said, we have a lot of evidence about the Soviet high-energy laser program and a lot about their ground-based laser effort. Based on that information, we have concluded from looking at all the evidence that this is what they are likely to do in the 1980's.

Senator BINGAMAN. What kind of ground-based laser are they developing at Saryshagan?

Mr. GERSHWIN. They have had two lasers at Saryshagan for a number of years.

One of the lasers is the laser we would expect to see them use for the feasibility demonstration, so that the laser facility is in place.

Senator BINGAMAN. I am asking, is it a chemical laser, x-ray laser? What is powering the laser?

Mr. GERSHWIN. I cannot get into detail of what that laser is, but in our estimation we are looking at a fairly high-power, high-energy laser, but the actual characterization of what that is I would rather leave out.

Senator BINGAMAN. Let me ask about your discussion of particle beam weapons. There again you say that the technical requirements are so severe that you estimate a low probability that they will even test a prototype before the year 2000.

So that you see this as substantially further away, they may test the ground-based laser this decade, but you would not expect them to test a particle beam weapon until after the year 2000?

Is that what you are saying?

Mr. GERSHWIN. That is correct, for a space-based particle beam weapon. We think that it is a very difficult technology achievement.

Senator BINGAMAN. You would not expect them to test a space-based particle beam weapon until after the year 2000?

Mr. GERSHWIN. That is our assessment.

Senator BINGAMAN. You talk about an airborne laser.

When would you expect them to test an airborne laser?

Mr. GERSHWIN. That is unclear. It depends on exactly what their objectives are for an airborne laser. There are a number of possibilities that an airborne laser can be used for, some of which are easier than others. We see, in fact, a Soviet program including an aircraft.

Senator BINGAMAN. You don't have an estimate as to when they might test an airborne laser or an estimate as to when they might be able to field an operational system?

Mr. GERSHWIN. We have had some discussion of that which we have not put into the testimony. I don't want to get into the specifics of that, but they have an ongoing airborne laser program at the current time.

Senator BINGAMAN. I am struck by the language you use in part of this testimony on page 8 where you say the Soviets are conducting research for the purpose of acquiring the ability to develop particle beam weapons.

You are not saying that they have the ability to develop particle beam weapons?

You are saying they are conducting research for the purpose of acquiring the ability to develop particle beam weapons; is that right?

Mr. GERSHWIN. We are not looking at a pure research program. We are looking at the research program that the Soviets have which has, in our view, the intent to make technology improvements leading to such a capability. We expect the Soviets to attempt to develop and test particle beam weapons as an outgrowth of the technology effort.

Senator BINGAMAN. You know they are doing research with an intent to develop this, but you don't really have an assessment of what capability, if any, they have at the present time to do anything in this area.

Is that an accurate statement?

Mr. GERSHWIN. Not entirely.

Senator BINGAMAN. Could you rephrase it accurately?

Mr. GERSHWIN. We have a lot of understanding of what the Soviets are doing in their research and technology, but I really don't want to get into our current understanding of just exactly where they are. I would rather not discuss that in a public forum.

But we are certainly focusing on this effort as one of their more important technology efforts.

Senator BINGAMAN. Has the agency given a statement publicly about the level of capability the Soviets have in these areas?

You say you don't want to give that in this forum?

Mr. GERSHWIN. We can take a look for the record to see precisely what has already been made available at an unclassified level. I can't cite it at the moment, but there is information available on the intelligence about this in Soviet Military Power and in other places. We will have to take a look to see what is available.

[The information follows:]

The Soviet research and development effort in particle beams, potentially applicable to a particle beam weapon, has been impressive. The work on ion sources is particularly impressive. Such a weapon, however, requires significant achievements in a number of technology areas, and some of the requirements for a space-based weapon are particularly difficult. Thus we do not believe the Soviets today are close to testing a prototype particle beam weapon system applicable to ASAT or ballistic missile defense; we do believe they are working very hard in the research for such systems.

Senator BINGAMAN. Have we been able to detect any emanations from any of these laser and particle beam facilities that you are describing here in your testimony?

Mr. GERSHWIN. I can't discuss that.

Senator STEVENS. Your time is up, Senator.

Senator BINGAMAN. Thank you very much.

Senator STEVENS. Gentlemen, let me thank you for fending off the attacks of the ideological interpretations from the left and right. As I say, I think you have confirmed some of the projections you made in closed session before.

I would like to ask you about two specific areas.

One, the Krasnoyarsk radar. You mentioned in your statement, Mr. Gershwin, you expect by that the end of the decade, when a new network of large phased-array radars, including Krasnoyarsk, have a much improved

capability for ballistic missile warning, attack assessment and target tracking.

You said these radars are technically capable of providing battle management support to a widespread ABM system.

Are there other radars beyond Krasnoyarsk that would tie into such a system that you have mentioned?

Mr. GERSHWIN. Yes, we see a set of large phased-array radars of which Krasnoyarsk is a member of that set, and there are some six radars of that type either operational or under construction.

The Krasnoyarsk radar is very similar to the other five that we are talking about.

Senator STEVENS. Are the others part of an ABM system?

Mr. GERSHWIN. These radars are an improvement over the earlier Henhouse radars that the Soviets fielded much earlier and that have a number of functions. We would expect the Krasnoyarsk-type radars to have a number of functions, primarily ballistic missile detection and tracking, which means looking at reentry vehicles outside the atmosphere and tracking them as they go down toward the Soviet Union.

Within that ballistic missile tracking function is early warning, which is called ballistic missile early warning, which provides warning to the Soviet Union that they are under attack. That kind of warning function would lead to the Soviet decision to do something.

In addition, that type of information, if the radars are technically suitable and capable, could be used to feed an ABM system, if there were an ABM system deployed, to attempt to engage those reentry vehicles quickly before they actually come in and attack the target.

Senator STEVENS. The Krasnoyarsk radar is certainly capable of being a portion of a battle management system?

Mr. GERSHWIN. Yes.

Senator STEVENS. Which would support an ABM system of a territorial nature?

Mr. GERSHWIN. Yes, we see that as a technical capability because we expect the Soviets to have that technical capability in these radars.

The issue is, at least at the moment and certainly the near term, we don't expect to see that nationwide ABM system there, that such a network could feed. These radars could in fact be very useful and important, and we think would be important to the Soviet Union simply for their early warning function alone.

Senator STEVENS. The Krasnoyarsk radar is a violation of the ABM Treaty in terms of its location in the beginning, is it not?

Mr. GERSHWIN. Where it is located. It is located further inside the Soviet Union and it faces essentially in the wrong direction for it to have been allowed by the ABM Treaty, given that it is our assessment that it is for the purpose of tracking ballistic missile reentry vehicles.

Whether or not there is a nationwide ABM system for this thing to feed is not the issue for the ABM Treaty. The ABM Treaty forbids a ballistic missile early warning function for this radar if it is to be in that location. It is

tion if in fact it has another purpose such as space tracking or for national technical means of verification.

The Soviets have stated it is for space tracking. It is our judgment it is for ballistic missile detection and tracking. That is based on a very careful, thorough body of work done by the intelligence community, the entire intelligence community, on this matter.

It does not, however, mean that necessarily the Soviets intend to have a nationwide ABM system as a result.

Senator STEVENS. It could be part of one?

Mr. GERSHWIN. If they did have such a nationwide ABM system, this radar as part of this network would be an integral part of that ABM system because it would provide this important battle management function. It is not necessarily certain that that will happen.

Senator STEVENS. Are you prepared to comment on the technological capability of the Soviet systems as far as computer capacity to service the array of weapon systems that you have described here today?

Mr. GERSHWIN. A little bit. One of the issues about capacity has to do with the network of radars.

One of the most important aspects of potential for such radars to serve for battle management is the computer capability on the ground associated with those radars to process information they collect and sort it out in such a way that it can be usable quickly and accurately by an ABM system.

It is our assessment that the Soviets in fact are technologically capable of having that type of computer capability for these radars.

Senator STEVENS. I am talking about the computer capability in order to have an early warning system for bombers, approaching bombers. They would have to have a computer capability tied together with the Krasnoyarsk radar?

Mr. GERSHWIN. Yes.

Senator STEVENS. In order to have a territorial ABM system, they would have to have a better system?

Mr. GERSHWIN. Yes.

Senator STEVENS. In order to have the laser capability you describe, they would have to have computer capability?

Mr. GERSHWIN. Yes.

Senator STEVENS. It is possible to analyze the Soviets' computer capability in terms of their production, maintenance and their whole capability in the computer sense to judge whether they have the capability now to support this vast array of highly technological and new generation weapons systems, in effect what you have presented to us?

Do they have the capability to support that today?

Mr. GERSHWIN. We certainly evaluate the Soviet computer capability and look for those kinds of points. It is our estimation they do have computer capability to be able to support this network of radars for the purpose of ABM battle management.

The Soviets have a lot of serious limitations in their computer capability. They are certainly limited in many aspects of computers, especially for the nonmilitary part of the country.

For these kinds of functions we are describing and the time

the basic computer capability. Whether that computer capability is fully realized is another issue. That is not easy to tell because technological capability to have computers do certain things and the actuality of that can be different.

Mr. GATES. I might add, Mr. Chairman, to the degree the Soviets do have limitations or are behind us in computer technology, they have a very aggressive program to both buy and steal computer technology in the West to help them along in this area.

Senator STEVENS. Gentlemen, we are in the second round.

Senator Proxmire?

Senator PROXMIRE. A lot of people feel that our intelligence community and our military always see the Russians as 10 feet tall and exaggerate their capability.

I have in front of me here a chart that comes from the Acting Under Secretary of Defense for Research and Engineering, Mr. Wade, which shows U.S. superiority in 15 of the 20 most important basic technology areas, equal to the U.S.S.R. in five, and the U.S.S.R. superiority in none.

The one area where the United States is superior and where the superiority is improving is in computers.

Furthermore, the Soviets, as you say, are way behind in computers.

I just wonder if, in view of that situation, you undoubtedly can count the number of bombers and number of missiles and number of planes, and so forth, but the quality, the reliability, the maintenance capability of this equipment, don't we assume that these would work when the likelihood is that in many cases they would not and that the assessment may exaggerate their strength.

Mr. GATES. Senator, I think the answer to that is that the Soviets have demonstrated in their use of military equipment that in fact it does work.

Senator PROXMIRE. It has not worked very well in Afghanistan.

Mr. GATES. It has not been the equipment that has been at fault in Afghanistan. It is very difficult for it to work when the Mujadins are blowing it up.

The question is whether the Soviets can get what you might call "B" level technology in the field while more superior technology elsewhere is not being introduced in the forces.

The way the Soviets have built their forces over the years is to go ahead and field what they can get out there and then over time to improve it. Part of what we see is this continuing modernization of the Soviet force.

Sometimes they go with modest improvement over a missile or a piece of equipment that they have already fielded.

At other times they will field something that is new.

At the same time we see evidence in a variety of areas where the Soviets may be making a considerable jump ahead, not necessarily jump ahead of us, but jump ahead in their own technology, so that they can introduce new things.

I wouldn't want to address whether the Soviets are ahead or we are ahead, but the fact is that they have a great deal of new technology and they are able to get it into the field and then they will continue to improve it over

Senator WARNER. Let me try the question in a slightly different way.

Just observing for the purpose of the answer the strategic military field.

Is the Soviet computer capability keeping pace with advancement in strategic systems?

Mr. GATES. I don't think we honestly know the answer to that question. I think what we have is a capability to field specific systems which Mr. Gershwin referred to, these radars, these aircraft, and so on.

Occasionally they have difficulty in production of these things because of quality control, and so on, particularly the higher technology equipment.

At the same time where the intelligence community may not have adequate information is their ability to integrate all of this and their capacity to do that.

Mr. GERSHWIN. As the Soviets get into more complex systems, they could create some serious problems for themselves. The Soviets, we think, have made a serious commitment to seeking to deploy weapon systems with essentially as good technology as they know how to have because they are concerned about the technological levels of our efforts and feel that sheer numbers alone are not the answer to what they need.

They essentially made a strong commitment toward more sophisticated, more highly technological equipment. That causes obvious problems as was noted.

Their deficiencies in the computer area could affect some of that. The question would be essentially as the Soviets deploy these advanced cruise missiles they have been coming along with, how good are they in the sense that they depend on a lot of computer equipment?

That is the kind of issues one can deal with.

Senator WARNER. Are they closing the gap in their ability to keep pace with computer technology matching the progression in strategic systems?

Mr. GERSHWIN. It is hard to answer. I don't think we can really answer, as much as I understand the need for that. Let me note that generally when the technology comparisons are made between the United States and Soviet Union and what Senator Proxmire was referring to from the Defense Department, those comparisons are not of technology in the weapon systems.

Those are comparisons of the technology levels achieved in the technology area, not applied yet to the weapon systems.

It is our view that the Soviets, while they have lots of deficiencies certainly in the computer technology and elsewhere, know their deficiencies and seek to in fact incorporate those technologies frequently as they improve them into weapon systems.

If they are running a weapon system modernization program, that is, in their view, consistent with where they are technologically, that means they are not mismatching.

Senator STEVENS. We have to go. I want to thank you both for being so forthcoming.

I want to state for the record some Senators have asked to

ator Warner and me. We will submit to you those questions we think should be put in the record on issues that were not addressed here and within the time constraints that would have been imposed on Senators had they been here.

[Questions with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR STROM THURMOND

Senator THURMOND. Dr. Gershwin, your prepared text indicates that the Soviets will replace most of their ICBM force by the mid-1990s if current trends continue. What sort of throw weight capability will this give them?

Dr. GERSHWIN. The overall throw weight of the Soviet ballistic missile force could increase, if the Soviets expand their forces beyond current numbers, or could decrease somewhat, if the Soviets reduce their forces along the lines of the Soviet START proposal.

Senator THURMOND. Dr. Gershwin, if the Soviets ignore the present number of approximately 2500 missiles and heavy bombers and utilize all of their current and projected production capacity what sort of force structure will they be capable of fielding by the mid-1990s?

Dr. GERSHWIN. If the Soviets were to expand their forces along these lines, they could achieve a force size in the mid-1990s comparable to the expanded forces illustrated in figure 5, with a force mix similar to that shown in figures 2, 3, and 4. This force would be predominantly ICBMs, both silo-based and mobile, with significantly improved capabilities in the submarine and bomber components. The increase in warheads would be substantial, much greater in percentage than the increase in the number of deployed missiles and bombers.

Senator THURMOND. Mr. Gates, Soviet strategic developments surpass any reasonable need for deterrence. What do you feel are Soviet objectives?

Mr. GATES. Soviet objectives in building strategic offensive forces are to provide nuclear capabilities comparable to, or in excess of, the capabilities of all their enemies combined. As a result of these objectives, combined with their strategic defense and command and control efforts, they seek to be in a position to be able to fight effectively in any kind of conflict, including a strategic nuclear conflict. Their objective in preparing for such a conflict, if it occurs, is to be able to prevail, in the sense that they can accomplish their offensive military campaign objectives while also enabling the Soviet homeland to survive and remain viable.

Senator THURMOND. Dr. Gershwin, if Soviet warhead accuracies continue to improve during the next decade at the same rate as the last decade, what sort of accuracies can they achieve by the mid-1990s?

Dr. GERSHWIN. We expect the accuracy of Soviet ICBMs to continue to improve. The new heavy ICBM we expect the Soviets to deploy in the late 1980s is likely to have improved accuracy such that it will achieve a substantial increase in damage capability against hardened targets. Our specific quantitative projections of future missile accuracy are classified.

QUESTIONS SUBMITTED BY SENATOR DAN QUAYLE

Senator QUAYLE. Dr. Gershwin, what does the Soviets' continued emphasis on strategic defense and the hardening of their command and control and leadership bunkers tell us about Soviet strategy and the likelihood that they believe or adhere to a Mutual Assured Destruction approach to nuclear war?

Dr. GERSHWIN. While the Soviets believe that the destructive effects of a nuclear attack on their homeland would be a catastrophe, they do not accept mutual assured destruction as an operating principle for the development of their strategic force posture. They have consistently invested as much in strategic defense as they have in strategic offense. In their view, it is possible that nuclear war could occur. Their emphasis on strategic defense and command and control hardening has, in their view, the effect of enhancing the survivability of key elements of Soviet war-fighting capabilities, in the event of nuclear war, thereby enhancing their chances for prevailing.

Senator QUAYLE. Dr. Gershwin, if the Soviets decided to use their Moscow ABM system to protect several key military assets rather than the Moscow population against a U.S. attack, how effective would their defenses be in protecting such military assets?

Dr. GERSHWIN. The improved Moscow ABM system of 100 silo-based interceptors will increase their capabilities to defend against small-scale attacks on key targets

around Moscow, but would ultimately not be effective in defending against a large-scale attack against key targets in Moscow. Such an attack, however, would require a greater number of warheads to assure a high degree of success than if the targets were undefended, and would require using some weapons to attack key elements of the ABM system.

Senator QUAYLE. Dr. Gershwin, in your testimony you state that the "the potential exists for the production lines associated with the upgrade of the Moscow ABM system to be used to support a widespread deployment" and that the Soviets could undertake effective, rapid deployment of defenses for key military targets by the early 1990s. How long might it take the United States to detect such a deployment? What sort of responses would we then have to initiate?

Dr. GERSHWIN. We cannot provide an unclassified answer to this question. The issue of the types of responses the United States would have to initiate should be addressed to the Department of Defense.

Senator QUAYLE. Dr. Gershwin, looking at your figure 5 on the growth of Soviet warheads with and without SALT constraints, it appears that by 1994 there is little difference between the SALT constrained number and the continuation of recent trends. How likely is it that the Soviets would go to a "maximum effort" beyond recent trends given your determination that they already have enough warheads to destroy all U.S. ICBM silos and launch control centers?

Dr. GERSHWIN. The 1994 figure did not include a projection of the number of warheads the Soviets could have within SALT II through 1994; rather, it showed a projection for SALT II through 1990, with an assumed expansion thereafter, compared with projections of assumed expansion starting in 1986. A projection of the number of deployed warheads assuming SALT II constraints through 1994 would come out somewhat lower than the projections shown in the figure that assumed some expansion beyond such limits. The difference could be several thousand warheads, maybe more, but it is by no means certain that the Soviets would expand very much more than they are already doing within SALT II limits. The larger of the projections of Soviet expansion is not a maximum effort but would require a substantially greater commitment of resources than exhibited in recent trends. The number of U.S. hard targets is an important criterion for the Soviets in gauging their force size and capabilities, but there are a number of other factors that would be taken into consideration. The factors that would affect the likelihood that the Soviets would go to such a greater effort include the state of the US-Soviet relationship, the prospects for arms control agreements or negotiations, the nature of the strategic defense efforts on both sides, and the nature of U.S. strategic modernization efforts.

Senator QUAYLE. Dr. Gershwin, in your testimony you state that "The Soviets will face important decisions in the next few years as they proceed with flight-testing the ballistic missiles which are scheduled to begin deployment in the late 1980s and early 1990s," that they "have technical options to test the new ICBMs in such a way as to conform with, or exceed, the SALT II limits." Are you referring to whether or not the SS-18, SS-X-24, SS-X-25 and SS-NX-23 follow-ons will be merely modifications (new mods.), which are permitted, or true follow-ons (new missile types), which are not? If so, isn't the problem that with Soviet encryption, we have difficulty verifying the difference?

Dr. GERSHWIN. The modernization limits in SALT II established various criteria for ICBMs and SLBMs in judging whether modernization was permitted. The limitations were more stringent for ICBMs than for SLBMs. We envision the potential for the new ICBMs we expect to see flight-tested in the 1986-90 time period—follow-ons to the SS-18, SS-X-24, and SS-X-25—to be tested in ways that exceed some of these limits, but it is possible they may not be tested in these ways. We have been concerned with Soviet encryption practices in their flight test programs, but I do not want to be more specific on this issue at the unclassified level. Our concern, and the reason that the Executive Branch has determined that Soviet encryption practices are a violation of the SALT II Treaty, is that Soviet encryption impedes U.S. verification of Soviet compliance with Treaty limits.

Senator QUAYLE. Dr. Gershwin, in your testimony you state that you are concerned about "the Soviets' longstanding commitment to strategic defense." Precisely why are you concerned? What relation, if any, does this concern relate to your assessment that "Soviet leaders are attempting to prepare their military forces for the possibility that they will actually have to fight a nuclear war?"

Dr. GERSHWIN. We addressed some of our concerns in answer to your question 1. The Soviet efforts are indicative of a Soviet attempt to prepare for the possibility of actually fighting a nuclear war. The Soviets' commitment to strategic defense has been sustained over many years, and is an integral part of their overall strategic force posture. If the Soviets come to believe that their strategic defense efforts



dismantlement or conversion, could be retained somewhat longer than would be the case if arms control limitations were being observed. We judge, however, that the Soviets are much more likely to deploy the follow-on for the SS-18, and the silo version of the SS-X-24 and its follow-on, in existing silos as replacements for the missiles now in those silos, than to build completely different silos and retain the existing ones as well.

Senator LEVIN. Would the kind of ABM system deployed around Moscow have any capability against the U.S. Mark-500 Evader maneuvering RVs that the Navy developed for the kind of Soviet ABM expansion your testimony describes?

ANSWER. We cannot provide an unclassified answer to this question.

Senator LEVIN. Do you have any evidence of Soviet intent to break out of the SALT II or ABM Treaties?

ANSWER. We have no direct evidence of Soviet intent to break out of either SALT II or the ABM Treaty, in the sense that they are moving to increase their deployed strategic offensive systems beyond current numbers (SNDVs have been, and continue to be, greater in number than the Treaty would have required), and in the sense that they would clearly exceed 100 ABM launchers. We do have evidence, however, of Soviet potential and capabilities to exceed such numbers, and we do have evidence, as documented in the President's report to the Congress, of Soviet violations of both of these treaties. In the case of the SS-X-25 ICBM, the Soviets have tested and are in the process of deploying an ICBM that, according to the SALT II Treaty, they are not allowed either to test or to deploy. In the case of the Krasnoyarsk radar the Soviets are continuing to build a radar that, according to the ABM Treaty, they are not allowed to build.

Senator LEVIN. Have you reached a judgment that we would be better or worse off if the Soviets modernize their strategic nuclear forces in the ways you have indicated might happen? If so, what is that judgment?

ANSWER. The modernization efforts for strategic nuclear offensive forces described in the testimony are our judgments of what we expect the Soviets will do, not just of what might happen. In many cases the testing or deployment is well underway, and the commitments have been made. While the Soviets' vigorous efforts will lead to important improvements over the capabilities of their current forces, the Intelligence Community has not made a judgment as to whether the United States is better or worse off as a result. Such an evaluation would have to take into account actual and potential U.S. efforts.

Senator LEVIN. Have you reached a judgment that we would be better or worse off if the Soviets continue to be limited by SALT II constraints? If so, what is that judgment?

ANSWER. We have not reached such a judgment. Such a judgment would have to be based on a net assessment that included current and projected U.S. forces.

#### QUESTIONS SUBMITTED BY SENATOR JAMES McCURE

Senator McCURE. Is this testimony based upon NIE 11-3/8-85, the National Intelligence Estimate on Soviet Strategic Forces?

ANSWER. Yes, the testimony is based upon NIE 11-3/8-84/85, the most recent NIE on Soviet strategic forces.

Senator McCURE. What is your best judgment on whether the Soviets will deploy a nationwide ABM defense during the next 5 years?

ANSWER. We have not made a firm judgment on whether or not the Soviets will deploy such a defense during the next 5 years. We have evaluated their potential for such deployments, as noted in the testimony, and we are particularly concerned about their potential. For several years the Intelligence Community has emphasized this concern—what amounts to a warning of the possibility. There are differing views among intelligence analysts about the prospects for such deployments.

Senator McCURE. How many interceptor launchers would be entailed in a Soviet nationwide ABM defense?

ANSWER. We do not have a best estimate of the size of such a deployment. We have looked at a number of possibilities, based on our understanding of Soviet priorities for defensive protection (primarily their leadership and military forces), the technical capabilities of their ABM components, and their production and deployment potential. If the Soviets deployed a nationwide ABM defense, to provide some protection to many key facilities nationwide but not protecting all potential targets, they would have well over 1,000 launchers, perhaps even a few thousand.

Senator McCURE. How many net additional mobile SS-24 and SS-25 ICBM launchers will probably be deployed in the next 5 years? How many mobile ICBM bases are under construction?

ANSWER. The specific answer to these questions are classified. We expect hundreds of mobile ICBM launchers—SS-X-24s and SS-X-25s—to be deployed over the next ten years and, as noted in Figures 1 and 2 of the testimony, to constitute an important part of the Soviet strategic force. The Soviets have built new bases for the SS-X-25 ICBM, and are converting former SS-20 bases to be SS-X-25 ICBM bases. They are preparing for the deployment of the rail-mobile SS-X-24 ICBM.

Senator McCURE. What is your best estimate of the rate of growth annually for Soviet strategic forces and defense spending through 1990?

ANSWER. We expect a growth rate of 5 to 7 percent a year in Soviet expenditures for strategic forces (offense and defense) over the next 5 years. This growth rate, combined with our expectations for Soviet spending on conventional forces, leads to growth in total defense spending of between 3 and 4 percent per year.

Senator McCURE. Please describe SS-20 follow-on, and scale of new SS-20 base and launcher deployment.

ANSWER. As noted in the testimony, during 1984 the Soviets embarked on an unprecedented program for constructing new SS-20 bases, starting more new bases than in any previous year. The SS-20 force is expected to expand to over 450 deployed launchers by 1987, as a result of the base construction program. The total would have been considerably higher if the Soviets had not deactivated SS-20 bases in the central USSR to convert to SS-X-25 ICBM bases. A follow-on to the SS-20, which also carries three warheads and is probably designed to improve lethality, began flight testing in 1984.

Senator McCURE. How many additional warheads are on the Soviet Backfire bomber force?

ANSWER. I cannot provide specific numbers at the unclassified level for the number of additional warheads on the Soviet Backfire bomber force. Backfire bombers are capable of carrying nuclear bombs and, as noted in 1985's Soviet Military Power, the Soviets at that time had 250 Backfires in the force, including 120 in Soviet Naval Aviation.

Senator McCURE. Will deployment of MIRVed SS-24 and SS-25 and SS-23 missiles result in 3 or 4 thousand more Soviet warheads by 1990?

ANSWER. We expect MIRVed SS-X-24 missiles to be deployed beginning in 1986, but those missiles of the SS-X-24 type going into silos will replace silo-based SS-17 and SS-19 missiles; those that are rail-mobile will be added to the force, but the Soviets may very well retire SS-17s or SS-19s as these new mobile missiles are deployed. The new SS-NX-23 SLBM will be deployed in late 1985 or early 1986 on newly built Delta-IV submarines, of which there will be only a few, and will replace MIRVed SS-N-18 missiles on the more numerous Delta-III submarines. The 1-RV SS-X-25 will be added to the force beginning this year, but the Soviets are retiring older SS-11s as the SS-X-25s get ready to enter the force. While the Soviets will not necessarily retire older SS-11s and SS-13s as they deploy the SS-X-25 and its follow-on (potentially having a MIRVed payload), we judge that they will retire most, if not all, these older missiles, even if they do not need to because of arms control limitations. The deployment of these new missiles will be substantial; the replacement of older missiles and the growth in the number of MIRVed SLBMs, together with the deployment of more ALCM-carrying bombers, will result in an increase in the number of deployed warheads on the Soviet strategic intercontinental attack force of at least 3,000 warheads by 1990, even without expansion of the current number of deployed launchers or an increase beyond SALT II limits in the number of MIRVed missiles and ALCM-carrying aircraft.

Senator McCURE. Will the new Soviet ICBMs about to be flight-tested conform to SALT II constraints on ICBM characteristics and "new type" ICBMs?

ANSWER. As noted in the testimony, the Soviets have technical options to test these new ICBMs in such a way as to conform with, or exceed, the limitations on characteristics and improvements in the unratified SALT II Treaty. Before these missiles are flight tested, it is not possible to predict with any confidence what their demonstrated characteristics will be, or what potential they will have, demonstrated or not, in these characteristics. Our raising the issue of Soviet options and decisions on how to proceed with testing these new ICBMs stems from our concern for the potential problems these missiles could pose in terms of compliance with SALT II modernization limitations.

Senator McCURE. Why do you downplay Soviet reported capabilities to detect submerged submarines from space?

ANSWER. The Soviets are energetically pursuing antisubmarine warfare research and technology efforts. These are of the highest priority for the Soviets, because their current capabilities to detect and locate submerged U.S. submarines are so poor. While Soviet efforts are extensive and the priority is high, the task of developing an ASW system posing a significant threat to U.S. submarines is a very difficult one. These Soviet ASW efforts are followed with great interest by the Intelligence Community, and we are well aware of the potential implications of Soviet success in this area, but we do not foresee the Soviets developing an effective ASW capability against U.S. submarines in the 1990s, based on the efforts we have seen thus far.

Senator McCLURE. Do the Soviets have 4 Anti-Satellite systems: (1) SL-11; (2) ABM-3, SH-08; (3) Ground-based Moscow Laser; (4) Ground-based Sary Shagan Lasers?

ANSWER. Today, in addition to the dedicated nonnuclear orbital interceptor ASAT launched by the SL-11, other systems—the nuclear Galosh ABM interceptor and two ground-based high-energy lasers at Saryshagan—have potential ASAT capabilities. The other systems noted in the question are not assessed as currently posing an ASAT threat.

Senator McCLURE. If the Soviets deploy a nationwide ABM defense between 1985 and 1990, at what percentage will their defense spending increase each year?

ANSWER. Depending on the rate at which such an ABM defense was deployed, the annual rate of increase in their expenditures for strategic forces would be 7 to 10 percent, compared to 5 to 7 percent without ABM expansion. In this case total defense spending would increase at about 4 percent per year.

#### QUESTIONS SUBMITTED BY SENATOR WILLIAM PROXMIRE

Senator PROXMIRE. Mr. Gates, what is the CIA's assessment of what the Soviet Union's immediate military response would be if the United States began deploying a star wars system?

Mr. GATES. The Soviets would build most of their strategic forces for the 1990s as previously planned, and would avoid major disruptions in both the defense sector and the overall planned economy. Thus, they are likely to emphasize programs that have intrinsic value to Soviet strategic forces with or without SDI deployments, such as: modification of existing systems to increase the number of warheads, expanded use of decoys and penetration aids, expanded deployments of long-range bombers, and deployments of large numbers of cruise missiles. The current Soviet ABM system could be upgraded and expanded to provide terminal defense. In addition, the Soviets would begin to develop modifications for their newer ballistic missile systems with reduced vulnerability to SDI from that of their current systems. They would probably begin implementing active defense suppression measures to be able to potentially interfere with SDI operation (sensor blinding, communications jamming, etc.). In addition, regardless of whether the United States goes ahead with a large SDI program or cuts it back, the Soviets will continue their strong ongoing efforts in the technologies similar to those in the SDI program, as was detailed in the prepared testimony.

Senator PROXMIRE. You mentioned in your testimony that "all elements of the Soviet strategic offensive forces will be extensively modernized by the mid-1990s, as a result of programs that have been in train for many years." So unless the Soviets are constrained by arms control treaties, that extensive modernization will come about the time this Administration envisions a go or no-go decision on star wars. In other words, just as we're supposedly in a position to begin launching a star wars deployment, the Soviets will likely be at their peak capability as far as deploying offensive nuclear forces to overcome our defenses. Their production lines will be all warmed up and ready to go. So, unless Mr. Reagan gets the Soviet Union to agree to arms limitations and reductions before the end of his term he's going to leave the next President between a rock and a hard place. The decision on star wars will be due and the Soviets will be all ginned up for a big offensive arms race. Is that a correct picture?

Mr. GATES. The description of Soviet strategic offensive force modernization presented in this testimony was not a hypothetical description of what the Soviets would do without arms control constraints. Rather, it was a description of their new programs that are proceeding, and which the Soviets intend to have in any case. The large-scale replacement of their offensive forces is in progress; new ICBMs, SLBMs, and bombers are being deployed, those in flight-testing will soon begin deployment, and new missiles will soon enter flight-testing. The potential for expansion of their forces beyond arms control limitations has been a feature of Soviet ef-

forts all along, and at any expansion. The Soviet effort now underway is not a new phenomenon, and it will not peak in 1988. It is not unusual for the Soviets, and is the result of an unswerving commitment for the past two decades to build up and improve their strategic force capabilities.

Senator PROXMIRE. You mentioned in your testimony that the Krasnoyarsk radar is "technically capable of providing battle management support to a widespread ABM system, but there are uncertainties about whether the Soviets would rely on these radars to support a widespread ABM deployment." Am I correct in concluding from your statement that you agree with the assessment of many intelligence analysts that the Krasnoyarsk radar is not well suited to be an ABM battle management radar because it is poorly located and poorly configured to serve in that capacity? In other words, what everyone has been worried about doesn't have much value as an ABM battle management radar?

Mr. GATES. The Soviet network of new large phased array radars, including the Krasnoyarsk radar, is judged to be technically capable of providing battle management support to an ABM system. If the Soviets were to deploy a widespread ABM system in the next several years, they would, in our judgment, use this radar network to provide the battle management support. These radars, however, are large fixed installations, vulnerable to direct attack, and they are potentially susceptible to degradation from nuclear blackout effects. Without the support from these radars, a widespread ABM system would be much less capable. To the extent that such radars are defended by air defense and ABM, an attacker would, at a minimum, have to allocate more warheads to increase his confidence in being able to take such radars out quickly. It was felt, at the time the terms of the ABM Treaty were formulated, that radars on the periphery of a country were more vulnerable to attack, in part because they could not be defended as well without defenses placed forward of them, and hence the large phased array radars were required to be on the periphery in order to reduce their suitability for ABM battle management. By that logic the Krasnoyarsk radar, because it is in the interior of the Soviet Union, would be considered more suitable for ABM battle management than if it were on the periphery. The issue of suitability, however, is complex, and these radars appear less suitable for ABM battle management to some analysts than to other analysts. Because such radars are fixed, and they are key nodes for an ABM system's capability, there will always be an issue of whether an ABM system is worth having which depends to a great extent on a few, potentially quite vulnerable facilities. We remain concerned about the Soviets' potential to deploy a widespread ABM system, with these large radars as part of that system, and such a Soviet ABM system would pose serious national security problems.

Senator PROXMIRE. Mr. Gates, the President has stated that he would be willing to share our star wars research with the Soviets. I was astonished when I heard that. So yesterday I asked Secretary Weinberger, who testified before our subcommittee and who has also said he would share star wars research with the Soviets, whether he and the President had retracted that offer. But to my amazement, Mr. Weinberger said that he and the president had not given up the option of sharing star wars research with the world. And Secretary Weinberger didn't exclude the Soviets from the world. As an intelligence officer, what problems and nightmares would you have with giving the Soviets our star wars secrets?

Mr. GATES. The question you raise concerns relative national priorities. They are determined by the President after considering all the relevant factors, including our assessments. My personal views beyond that therefore are not really relevant.

Senator PROXMIRE. One of the simplest countermeasures the Soviets could employ against a boost phase defense is to shorten the burn time of their boosters so the bus deploys the warheads quicker and we have less time to attack the boosters. (1) Isn't it true that a lower burn time can be achieved with not too great a decrease in throw weight? (2) Isn't it true that the technology for fast burn boosters can be developed fairly easily? (3) Isn't it true that the Soviets already have been shortening the burn time of their boosters and as they deploy solid fuel boosters the burn time will be shortened even more?

Mr. GATES. One of the concepts for countering space-based weapons designed to kill during the boost phase is to shorten the booster burn time so that booster burn-out occurs before or shortly after the booster exits the earth's atmosphere. Such a boost concept either eliminates or, at a minimum, shortens the engagement time thus stressing the complex of defensive weapons. However, there are some difficult technical problems which must be overcome before such a boost concept could be implemented by the Soviets, and it is by no means clear that the Soviets would find such an approach attractive.

The high acceleration and aerodynamic loads experienced by fast-burn boosters with intercontinental range would require development of new missile structural materials, faster burning propellants, and improved missile control systems. While these particular problems can be solved, it would require a significant developmental effort. On the other hand, some much more difficult technical problems would be involved in effecting a major redesign to alter the shape of such missiles in order to be able to achieve the proper sequencing of operations for intercontinental range in a much shorter time.

If adequate solutions to the problems alluded to above are not obtained then missile ignition weight will increase which is, of course, not desirable for mobile missiles, or throw weight would have to be considerably reduced. The most significant result of the Soviets' moving to solid propellant ICBMs is the ability to deploy mobile ICBMs. It is highly unlikely that the Soviets could maintain their current level of throw weights if they went to fast-burn boosters. It is true that the Soviet solid propellant missiles have shorter burn times than the liquid propellant missiles; the current Soviet burn times for their solids are slightly longer than comparable US systems. They must at least cut in half their current burn times to approach an effective fast-burn booster. While there are perhaps no insurmountable technological problems in this, it is nevertheless a very challenging problem.

In attempting to assess Soviet counters to potential United States actions, it needs to be borne in mind that the Soviets will not necessarily adopt an approach that we would find the most logical. For example, the Soviets will continue to rely on heavy, liquid propellant ICBMs to at least the end of the century, for much of their strategic force capability, despite the very real vulnerability of the silos for these missiles to accurate U.S. nuclear weapons such as MX, D-5, and ALCM.

Thus, the issue of whether the Soviets would move to fast burn boosters to attempt to nullify a United States boost phase intercept defense turns on much more than whether it would be technically feasible. Serious consideration also needs to be given to the negative impact on their missile capabilities, force structure, missile mobility, and concept of operations.

Senator PROXMIER. What other countermeasures does the CIA believe the Soviets could deploy against a United States star wars system? What is the current CIA assessment of how easy it would be to deploy these countermeasures?

Mr. GATES. There are various countermeasures that can be used. Passive countermeasures include hardening missiles and reentry vehicles against the various kill mechanisms, reducing or altering the "signatures" or observable features of missiles and reentry vehicles, using decoys to draw down SDI resources or overload SDI communications and data processing. Active countermeasures include jamming communications, blinding sensors, and direct attack on satellites or ground facilities.

While most countermeasures can have degrading effects on a system as complex as SDI is expected to produce, none can be expected to be totally effective. Furthermore, any countermeasure has associated costs, in economic terms as well as in tradeoffs in performance. Countermeasures must be designed against the specific threat to be effective, and until the SDI results in a system it is not possible for the Soviets to decide what the most effective countermeasures might be or what course to take, nor is it possible for anyone to assess the effectiveness of such countermeasures.

The countermeasures issue is much more complex than just listing the various technical possibilities. Countermeasures designed to degrade or defeat one element of an SDI defense would not necessarily help against another element, so that layered defenses or a diversity of SDI techniques could impose the need for a multiplicity of countermeasure approaches by the Soviets, some of which might even be mutually incompatible.

#### QUESTIONS SUBMITTED BY SENATOR MARK ANDREWS

Senator ANDREWS. Recently, as you know, the President gave the orders that the United States comply fully with the limits agreed to with the unratified SALT II Treaty. Mr. Gates, does the National Intelligence Council have an official position on this and if so please tell this joint committee? If there is no official position, please tell this joint committee your position on the President's decision.

Mr. GATES. Intelligence information with respect to Soviet compliance was provided to the President and the National Security Council, but such information contained no recommendations for US policy on this issue. We do not have an official position on this policy matter, and it is not appropriate for me to offer any personal views.

Senator ANDREWS. Are you of the opinion, Mr. Gates or Mr. Gershwin, that the United States should pursue talks with the Soviet Union on arms control? What kind of arms control regime, in general, would you recommend the United States pursuing with the Soviets?

ANSWER. Whether it is in the United States interest to pursue arms control talks with the Soviet Union is a decision for the President to make. The job of United States intelligence is to keep track of Soviet developments in their strategic forces whether or not there are arms control limitations. The Intelligence Community does not take a position on whether the United States should pursue arms control talks or on the type of arms control regime.

Senator STEVENS. I want to tell you that, in my judgment, you did not get any criticism for a sham presentation because you really did declassify some information here this morning and I think it has been a real step in the right direction.

I am hoping we will have some ongoing dialog about other areas that are currently classified that ought to be at least sanitized and presented to the public.

I thank you and I thank the total intelligence community for their cooperation in this regard.

Senator WARNER. I join in that and say you have conducted yourselves in a most professional manner.

[Whereupon, at 12:30 p.m., the joint subcommittees adjourned, subject to the call of the Chairs.]