

[EXECUTIVE SESSION]

REVIEW OF THE SPACE PROGRAM

TUESDAY, JANUARY 26, 1960

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND ASTRONAUTICS,
Washington, D.C.

The committee met in executive session at 3:25 p.m., Hon. Overton Brooks (chairman) presiding.

The CHAIRMAN. The committee will come to order.

Is everybody screened, Doctor, from the viewpoint of the Pentagon?

Mr. DUCANDER. These are liaison officers from the Department.

Colonel CARTER. It is OK back here, yes, sir.

STATEMENTS OF DR. HERBERT F. YORK, DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING; AND BRIG. GEN. AUSTIN W. BETTS, ADVANCED RESEARCH PROJECTS AGENCY—Resumed

The CHAIRMAN. Doctor, at this point I want to ask you one or two questions. I really appreciate the sincerity of your testimony and I believe as we all do, that we want to try to protect this country from devastation by ICBM's or by any other means that the Russians have at their disposal.

For the first time in my life I have been really concerned about the security of our people back home.

I want to ask you this: Do we have a program underway to simplify the missile systems?

Dr. YORK. A program to simplify missile development?

The CHAIRMAN. Yes, to simplify the equipment and procedures in the operation of the missile?

Dr. YORK. Yes. This is what we refer to as our improvement programs on Atlas and Titan.

The CHAIRMAN. It seems to me you could do more that way perhaps than almost any other way.

Dr. YORK. Yes, indeed. We feel very strongly about that, that these first generation missiles which are a result of a crash program are complicated in many ways unnecessarily but when you are in a big hurry what you do when you come to making a decision about whether we will try this approach or that one, you take the one which is most certain rather than the one which is perhaps simpler but nevertheless would take more time to check out.

I do not have the statistics but I know for example on just the number of valves which there are in an Atlas engine, this number has come down from something in the hundreds as of 2 or 3 years ago, to perhaps one-tenth of that now—perhaps 20 percent, I am not really

quite sure—and we see all the signs of having it become simpler still.

So right in our programs as part of the Atlas and Titan program, we have simplification as being one of the main points of emphasis, with all the things that simplification means. It means easier maintenance, it means greater reliability and so forth.

The CHAIRMAN. It would mean a great savings, too, in cost.

Dr. YORK. Then there are certain operational simplifications that may not necessarily be equipment simplification, but nevertheless make it easier to actually fire one of these things in anger, on short notice.

For example, here we are developing what we refer to “as in-silo launch” for Titan. Without in-silo launch the missile is on a big elevator, the elevator brings it up, and then you fire it from the surface. That is some more equipment that you have to have that has to work in times of chaos and it is some more functions that have to be performed all in the proper sequence and at a time when presumably enemy bombs are bursting all around or might be.

In addition, separately from these big missile programs, the Air Force is right now trying to put together a set of programs proposed to them by their Ballistic Missile Division for still greater simplification of rocket engines, for example, and we are carrying on programs in developing storable fuels because it means again less operations that have to be performed at the time you want to fire the missile. Storable fuel is one that you can put in the missile and leave it already loaded.

I would be hard put to get a dollar value for this sort of work, but it is probably in the \$100 million class, just for simplification and this kind of improvement alone.

The CHAIRMAN. And yet it is vital to our development.

Dr. YORK. We regard it as very important because these missiles are very complicated and they must be made simpler.

The CHAIRMAN. I have heard it said that one reason the Russians were as effective as they are in the handling of their missile program, the ICBM program especially, is because they have a much larger booster and the equipment inside and the engines inside of that booster are larger. As a result, they get more efficiency out of them. There is less failure on the part of the engines or the operation of the equipment inside.

What would you say about that?

Dr. YORK. Once you get them in big, I mean Atlas size or even Thor size and Jupiter size and bigger, I do not think this makes very much difference to the rocket itself. It does make a difference in some of the applications. For example, in the case of lunar probes it has been the entire difference. The fact that they have more weight to play with means that they do not have to be so careful or so precise about what they do. They have more technology to choose from because they do not have to go for the extremes in miniaturization and so on. It has been a big advantage there.

In connection with missiles, I think it has not made much difference. But what did and what is really similar is—in 1954—because of the recognition of the fact that the situation was certainly not at all good—I mean the relative situations of ourselves and the U.S.S.R. in big weapons—we chose to start first the one we were most sure of: Atlas, as opposed to Titan, which was a two-stage missile.

The reason we did that is that with the Atlas design you can start all of the engines on the ground. In 1954 we were not certain how much of a problem there would be with lighting one of these engines in space.

Now as it turned out it is perfectly all right. But we did not know that at the time so we took the conservative course because of our feel- of the urgency of the situation.

In order to make an ICBM-range missile, with the one-and-a-half-stage type of design, you have to have very thin tanks because the Atlas is virtually a stainless steel balloon and that means it is more delicate. You have to trim every possible bit of weight off.

Now with the Titan and also with some of the more improved version of the Atlas we are not quite in that position anymore. As of the last year or so, we no longer have to trim every possible element but even this has paid off to some extent because by what amounts to virtually overdesigning the Atlas with regard to all of these things, getting all the weights down and so on, we have gotten a better bird than we anticipated.

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The CHAIRMAN. Am I right on this one point: I have heard a lot about gaps in our programs, but if we do not develop a bigger booster, the time may come when we will have a satellite that we are prepared to put up requiring a large booster, and will there not actually be a gap then in our development? In other words, unless we forge ahead with the bigger booster and satellite development, we are not going to have a progressive program, is that not right?

Dr. YORK. That could happen and since the booster is in many cases the longest leadtime item, that is why we very strongly support the big booster programs of NASA. Actually in most cases we have found a way around it by and large. The Discoverer program was instigated because we wanted to check out engineering components but did not have the bigger booster in order to enable us to do it in the full scale Midas, and Samos system.

It is possible that in the communications program we may end up waiting for a booster. These are not large gaps in time and for the programs that we are firm about in defense, talking now not about space programs in general but just our particular programs, the net loss in time will be very small because there are other things you can be doing.

The CHAIRMAN. There are things in these other programs that you consider important to national defense and if it reached development quicker than we think, it would be all right. But we would actually have a gap until the booster was ready.

Dr. YORK. We would have a problem there but not in the case of any of the others.

Mr. FULTON. Until we proceed with these other programs, we must proceed on a broad front and not consider one approach as against another.

I agree with the chairman that we must move on a multilateral approach rather than emphasize one particular weapon and put our strategic defense on that particular method. Don't you agree with that?

Dr. YORK. Yes, and furthermore, I believe, if I understood you right, we can afford to do that. We do it in quite a number of cases. When we are finally certain we try to concentrate but we carry on alternative approaches in these matters.

Mr. FULTON. So, for example, with the Atlas program, while you did diminish maybe from 4 to 2 firings per month, you, nevertheless kept the Thor program going, to pick up other information.

My point is this: If we keep a broad-based approach, while we may not be successful on each of these programs as an end item, nevertheless, we keep the pyramid of our scientific knowledge growing on a broader base. Would you agree with that?

Dr. YORK. Yes.

Mr. FULTON. That is all, thank you.

Mr. ANFUSO. Dr. York, I asked you this question about the early warning systems. Do you have any information on that?

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The CHAIRMAN. Mr. Chenoweth?

Mr. CHENOWETH. Doctor, I am interested in knowing about the comparison on the number of operational missiles. Atlas is our only operational missile.

Dr. YORK. Atlas is our operational ICBM missile.

Mr. CHENOWETH. Are you in a position to tell us how many we have.

Dr. YORK. I do not believe that I should. The testimony on that has come from the Secretary, the Chiefs of Staff, and the CIA.

I have heard it but I would rather not—

Mr. CHENOWETH. How does it compare with what the Russians have? That is what I am interested in.

Dr. YORK. We both have very small numbers.

Mr. CHENOWETH. The Atlas has been in operation since September?

Dr. YORK. It was turned over to the operations in September.

Mr. CHENOWETH. We visited the Convair plant where they are producing it and I forget what they told us the production program was. It seemed to me they were moving along at a pretty good pace.

Dr. YORK. The bottleneck on operational Atlas is not the missile at the present time but all the ground equipment, and the whole base structure. The missile cost is approximately 15 percent of the cost of a base. The missiles for a base cost about 15 percent of the cost of the base and that is a measure of the man-hours, complexity, and so on, involved in setting them up.

Mr. CHENOWETH. We have the base at Vandenberg.

Dr. YORK. Yes; we have "a" base at Vandenberg.

Mr. CHENOWETH. Don't we have more than one there? I thought we saw two.

Dr. YORK. You saw [* * *] missiles probably on launchers. There are also some other big ICBM installations there for test and evaluation of the missiles that could be used eventually.

General BETTS. Mr. Chenoweth, could I give you a number that would help you to appreciate the problem here?

Mr. CHENOWETH. Certainly.

General BETTS. After the construction is complete—and I mean the concrete for the hole in the ground and the things there.

Mr. CHENOWETH. You are talking about the silo operation?

General BETTS. Yes. The things that a constructor can come in and do, after that is complete, it takes * * * man-years, or more, of engineering effort, of engineers and technicians on site, to take the missiles and check out equipment and loxing, the fueling and the pumps and the valves and all of that, just to hook it up.

This is really the thing that makes it such a long-drawn-out problem to get to big numbers of intercontinental ballistic missiles, when we must be in the posture of surviving their attack.

In other words, if we did not have to worry about their attack, we could just crank out Atlas missiles, stand them in the open and this would be a completely different proposition, but since we are going into concrete and a hardened configuration, there is over * * * man-years of effort onsite, just to hook up the pieces and make them work.

Mr. CHENOWETH. After you get that built, you can use it over and over?

General BETTS. Oh, yes; there is no question about that.

Mr. CHENOWETH. Doctor, in connection with that, are we working on putting these launching sites underground? When we are ready to launch these missiles we will have different places, I understand, all over the country, where we expect to put these underground; is that correct?

Dr. YORK. Yes. The first few Atlas squadrons will not be that way but all the Titan squadrons and all of the Atlas squadrons except the first few will be in deep silos for launching.

Mr. ANFUSO. And an attack would not burst them or destroy them?

Dr. YORK. It depends on how close they hit.

Mr. ANFUSO. A direct hit?

Dr. YORK. A direct hit always takes one out.

Mr. CHENOWETH. When will the Titan be in operation?

Dr. YORK. It comes in in mid-1961. Now, that is assuming we get over the present difficulties in Titan.

Mr. CHENOWETH. Do you think it will be next year before Titan is operational?

Dr. YORK. Yes; mid-1961.

Mr. CHENOWETH. What is the basis of that prediction?

Dr. YORK. Well, that is the schedule when you put everything together that has to be done. When the contractor and the responsible people in the Air Force put together all of the judgment as to how these things will work out.

Mr. CHENOWETH. You are 3 years ahead on Atlas and it is reasonable to assume you might be a little ahead on Titan.

Dr. YORK. I really do not think so. First of all, these Titans are all starting out in the hardened configuration, which means that all the holes have to be dug, all the civil engineering has to be done, all the assembly work that General Betts spoke of has to be done.

I doubt that we would be ahead of that * * *.

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Mr. CHENOWETH. How are you doing now? Are you picking up some?

Dr. YORK. It is hard to say. There is a Titan schedule this week and we will have to see how it goes.

Mr. CHENOWETH. That is all, Mr. Chairman.

The CHAIRMAN. Mr. Osmer.

Mr. OSMERS. Mr. Chairman, while we were in open session there was an exchange between Mr. Anfuso and Dr. York which I would like to go back to for a moment.

The statement was made, I believe, by Mr. Anfuso, that the Russians were believed to be spending * * * times as much as the United States on missile-satellite-space development.

Now, Mr. Chairman, I think I have been following this program pretty closely through this committee and also through the Armed Services Committee and this information does not jibe with other information which I have on this subject.

Now, I realize that there have to be guesses about what the potential enemy—

Mr. ANFUSO. Would the gentleman give us his information? I want correct information. I am just as much interested as you are.

Mr. OSMERS. I want to say, first—and of course I was very much upset about that uncorroborated statement being made with reporters in the room—in the first place, let me say that I have heard no one make a specific guess as to how many rubles are being spent on this program by the Russians.

The CHAIRMAN. Will the gentleman yield?

Mr. OSMERS. Yes.

The CHAIRMAN. The CIA gave us direct figures.

Mr. ANFUSO. * * *

Mr. OSMERS. I would suggest, Mr. Chairman, if that is so, that those figures be rechecked as to accuracy because I have a feeling that those figures will not stand up.

I would like to have Dr. York's view on it. I know he is not in the intelligence branch of the Government and I am not trying to put him in it.

Dr. YORK. That is right, and really the proper source is the intelligence community.

Overall for defense, the figure that I have heard—I would like to say this is second hand—is that they are buying about the same amount of defense we are. Now, this is an attempt to take into account the fact that some things are more expensive, some are cheaper, and so on.

Mr. HECHLER. If the gentleman will yield, how is it with relation to gross national product?

Dr. YORK. With relation to gross national product, it is larger.

Mr. ANFUSO. I am just as anxious as you are to get the truth on this matter, and I would certainly like to hear the opposite, if it is so. I think it is important for us to find out whether they are spending * * * times as much.

I frankly state to you, Dr. York, and to the committee, that that is my impression.

Now, you have just admitted, at least to your knowledge, that they are spending as much. We are a much wealthier country—

Mr. OSMERS. Now, excuse me, Mr. Chairman. The witness did not say that. He said overall for defense, not for missiles and satellites.

The CHAIRMAN. What did you say, Doctor?

Dr. YORK. That the total amount of defense that they were buying was about the same as the total amount of defense that we were buying.

You may be referring to an article by Hansen Baldwin, perhaps, in which he said that relative to the G.N.P. they are spending three times as much, but absolutely about the same.

The CHAIRMAN. How can we ever catch up, though, with them if we are spending exactly the same amount that they are?

Dr. YORK. Now, the question is, how much are we spending in specific categories, such as missiles and space?

The CHAIRMAN. I would say research and development. The figure is about the same in research and development, is it not?

Dr. YORK. I don't know what they are spending on space. They haven't launched an earth satellite for almost 2 years. I don't know what you make of that. I don't know what to make of it, myself, but they haven't launched an earth satellite in 2 years.

Mr. RIEHLMAN. I think we have to go back to the testimony given by Mr. Dulles; he gave us some figures as to what they were spending. However, that takes into consideration all of the Government's activities where we would have to not alone take in what defense is doing, but what industry is doing in research and development programs. In Russia everything is handled by the Government and every ruble that is spent in industry in research and development, and every program in research and development goes into this category of expenditures. Therefore, it wouldn't be fair to just simply say that what we are putting in our defense program is comparable to what they are putting into their defense program, because they are not taking into consideration what we are putting in through industry, and that runs into the billions of dollars every year.

Mr. ANFUSO. I think that is a good point that you raised, but my impression was—

Mr. RIEHLMAN. I am sure Mr. Dulles emphasized that when he spoke here the other day.

Mr. ANFUSO. My impression was that in making a comparison, Mr. Dulles was taking into consideration what we were spending also through private industry in the space effort.

Mr. RIEHLMAN. No, I am sure not. He really specifically said that if we did that, we would have to take into consideration what we were spending.

Mr. ANFUSO. Then why is it so difficult to get that? I would want to know, and so would you want to know.

Mr. FULTON. May I make a suggestion? Let us have our staff look into that.

The CHAIRMAN. That is an excellent suggestion. Now, I have a figure. I don't think I should give it out even in this meeting here. I don't think I have any right to.

Mr. OSMERS. Mr. Chairman, there is one thing that I think we should point out to the staff, or to anyone who undertakes this task, and that is that you will get lost in this subject, if you take an article such as Hansen Baldwin had in the Times, in which he starts to talk about gross national product and the percentage of this, multiplied by that.

I think the facts that this committee and this Congress—and the administration and the Department of Defense and NASA—must have, are facts as to the size and quality of the programs. If we start to relate it to rubles and dollars and make comparisons of American indus-

try and Communist organizations, and if they want to throw in the cost of running all their scientific schools, and if we want to, it would run it way up. I think that any of that information that we can get we want to get. But, basically, as a Member of Congress, and specifically of this committee, I want to know what the Soviet program is. Not the dollars, or how the figures got jazzed up, or comparing it to the gross national product.

So, in those terms, those are the facts I think we should get.

Mr. CHENOWETH. I would like to know just what we are spending overall now. In space, missile, and satellite programs.

Dr. YORK. Space missiles and satellite programs by the Government, and including procurement, about \$6 billion.

Mr. CHENOWETH. I was thinking it was a little more than that.

The CHAIRMAN. No; that is it. That is what was given us today.

Mr. OSMERS. Now, Mr. Chairman, right in connection with that figure: Are there any programs being conducted in the country by others, or by industry or by universities or by others, that would materially add to that if you were going to deal in expenditures?

Dr. YORK. Not in terms of expenditures and not that fits the definition of missile and space programs.

In terms of people, some of them involve very good people, but in terms of dollars they don't make much of a dent.

Mr. OSMERS. The expenditures would be in the \$6 or \$7 billion area?

Mr. ANFUSO. Will the gentleman yield there?

Mr. OSMERS. Yes; I will.

Mr. ANFUSO. And also you have to take into consideration the value of the dollar and what we can get for the dollar and what they can get for the ruble and what they can do without the ruble, without any expenditures at all.

The CHAIRMAN. It definitely presents a difficulty.

Dr. YORK. I was only answering the question in respect to what we spend.

Mr. FULTON. Mr. Chairman.

The CHAIRMAN. Mr. Fulton.

Mr. FULTON. I move the chairman be empowered to assign a staff officer, or officers, to the question of the figures along the lines that have been discussed here, and let them report for the record. I had talked previously with several of these people who were here in uniform, saying this would be a question of deep import, and there is quite a bit of difference of opinion and a little misunderstanding. I would rather have it authoritatively done, and let's have it done by the staff.

The CHAIRMAN. Let's see what Dr. Sheldon has to say. He may have the figures in his head.

Dr. SHELDON. Mr. Chairman, I wish I did. I only wanted to say that I hope the members of the committee will not be disappointed. Before joining this group I put in a year working with a large team of people on just this problem, with the full assistance of Central Intelligence. I assure you there is no way on anybody's part to come up with a set of figures which will compare dollars and rubles in a meaningful way. I am afraid you must go back to looking at programs.

With the help of these people we could give you a classified figure, but I say most sincerely and earnestly, after a year of full-time work with many people, that you won't get anything from the figure.

Dr. YORK. I am afraid I must agree with Dr. Sheldon.

The CHAIRMAN. Is there any objection to the motion?

Mr. RIEHLMAN. Just a moment. In view of what Dr. Sheldon has told you, and he is a member of the staff, and because of the experience he has had, I am just wondering whether Mr. Fulton is really serious about having his time spent on a program which he admittedly says can never produce the answer we are looking for. I would rather have him work at something else besides this.

Mr. FULTON. Dr. Sheldon didn't quite make it completely negative, universally. He said you would have to go back to the programs and compare programs and not try to translate back to rubles, dollars, and things of that type, isn't that it, Doctor?

Dr. SHELDON. Yes, sir.

Mr. FULTON. I think it would be profitable to have the good doctor look into it, but I think it profits us not in the least to try to do it here today.

Mr. OSMERS. Mr. Chairman, I would certainly want to agree with that suggestion, and I understand well the point Mr. Riehlman makes. It has to be programs, not dollars, economics, or gross national product.

The CHAIRMAN. I think if anybody can do it, Dr. Sheldon can, but don't be upset if he doesn't come up with a dollars-and-cents answer; but rather, makes it in programs.

Mr. FULTON. After he puts 1,000 man-years of work in on it, I want to recheck it again and see what we are doing.

Mr. OSMERS. It will no longer be a problem.

(The information requested is classified.)

Mr. CHENOWETH. I would like to ask how the next fiscal year's budget compares with what is spent this year?

Dr. YORK. For missiles and space, they both go up.

Mr. CHENOWETH. Can you give us an estimate of the figures?

Dr. YORK. The total research, development, test, and evaluation in the procurement budget and the line item for missiles alone goes from about \$2.15 billion up to about \$2.4 billion. That is about 10 percent and that is in actual direct obligations, the spending goes up probably a little faster. In military space, the related programs that I defined this morning, it goes from \$418 million up to \$480 million, which is about 15 percent and that is in direct obligations the spending goes up a little faster.

Mr. CHENOWETH. What is the last figure?

Dr. YORK. \$2.15 billion is the direct obligations on all missile programs. That is approximately half big missiles and half small missiles.

Mr. CHENOWETH. That is procurement?

Dr. YORK. No; that is research, development, test, and evaluation.

Mr. CHENOWETH. What is the second figure?

Dr. YORK. That is the separately identified military space programs.

Mr. CHENOWETH. We are spending \$4.2 billion—

Dr. YORK. Let me say them again: In missiles, but not including space, it is about \$2.15 billion in 1960, in new obligations. About \$2.4 billion in 1961, in new obligations.

Mr. CHENOWETH. Now, what is your second figure?

Dr. YORK. In military-related space programs, the ones I discussed this morning, it is \$420 million in 1960, \$480 million in 1961.

The CHAIRMAN. \$481 million?

Dr. YORK. From 418 to 481.

The CHAIRMAN. That is on page 4 of the statement.

Dr. YORK. That is the Midas program, the Samos program, the Navigations program, the Dynasoar program, and a small amount of miscellaneous component developments.

Mr. CHENOWETH. What items go into it?

Dr. YORK. In the 480, that is about it.

Mr. OSMERS. That is millions of dollars.

Mr. CHENOWETH. We are spending about \$6 billion.

Dr. YORK. I have now accounted for, call it a half a billion and then \$2.4 billion—

Mr. CHENOWETH. You are up to \$3 billion now.

Dr. YORK. Now, I am up to \$3 billion. I actually included that in the \$6 billion, I put in procurement of missiles, as opposed to development test evaluation, procurement.

Mr. CHENOWETH. Actual purchase of the finished article?

Dr. YORK. Yes; that is about \$3.5 billion.

Mr. CHENOWETH. You are up to \$6½ billion now, roughly?

Dr. YORK. Yes, and then there is the NASA—no, I am sorry, it is not—we shouldn't be up to \$6½ billion. We should only be up to about \$5.8 billion at this time because certain moneys are actually for one purpose, but in another account.

Then you add in the NASA budget and that brings you to about \$6.5 billion.

Mr. CHENOWETH. That is for fiscal year 1961.

Dr. YORK. That is for fiscal year 1961.

The CHAIRMAN. You give those figures to Judge Chenoweth, because I think the committee has all of that, Judge.

Mr. FULTON. I would like a full summary made by Dr. Sheldon to tie these things in on our program.

Dr. YORK. This includes small ones. It includes Bomarc, Nike-Hercules, as well as the big missiles.

Mr. FULTON. I know that in the Armed Services Committee there has been some research work done on this already. I inquired about it just before this session and it was not ready yet, but there will be some work already done by some of their staff.

The CHAIRMAN. I am having a little difficulty holding our members here.

Mr. ANFUSO. I move we adjourn, Mr. Chairman.

The CHAIRMAN. I have a lot of questions here that the staff has prepared. They are excellent questions. Could I submit them to you, Doctor, and ask you to answer these for the record?

Dr. YORK. Yes.

The CHAIRMAN. They are really excellent questions and should be asked you, but I recognize this, that if we do it, we will be here later

than we should and we are going to have a heavy session tomorrow.

For that reason, I am anxious to take up one or two matters here in executive session.

NOTE.—The questions and answers appear below.

Mr. CHENOWETH. May I ask one more question?

The CHAIRMAN. Yes.

Mr. CHENOWETH. Suppose we doubled that appropriation, Doctor, where would we be?

Dr. YORK. We would run out of people to spend it if we doubled it.

Mr. CHENOWETH. Nothing would be gained by upping the appropriation?

Dr. YORK. If you up it a little bit, you will get a little bit more. Doubling it is pretty drastic medicine.

Mr. CHENOWETH. Some groups have been suggesting we ought to treble it. It isn't practical to do that?

Dr. YORK. Not overall.

Mr. CHENOWETH. Even if we had the money?

Dr. YORK. No. You can always argue whether this should be trebled at the expense of that.

The CHAIRMAN. Mr. Bass?

Mr. BASS. Dr. York, would you or General Betts tell me what the extreme range is for the Atlas missile?

Dr. YORK. It depends on the payload. * * *

Mr. BASS. Would that mean then that we could hit any target in Russia?

Dr. YORK. You don't need that to hit the targets in Russia. You will get well over 95 percent of them at 5,500 miles.

The CHAIRMAN. We certainly thank you, Doctor. I have a million other questions to ask you, but I am not going to do it this afternoon.

And you too, General. We appreciate very much your action in being here this afternoon.

Just a minute, Mr. Anfuso. We have one more thing to take up in executive session.

I want to thank you and all of your staff for being present. Now, we will go into a superexecutive session to take a matter up with the committee.

(Whereupon, at 4.15 p.m., the committee proceeded to other business.)

QUESTIONS SUBMITTED TO DR. YORK BY REPRESENTATIVE OVERTON BROOKS

1. Dr. York, were you consulted in drafting the proposed administration legislation for amending the Space Act?

Answer. Yes.

2. Who consulted you. The President? Dr. Glennan? Dr. Kistiakowsky?

Answer. Dr. Glennan and his associates.

3. Was the Secretary of Defense kept fully informed of your activities in this matter?

Answer. Yes.

4. Did you assist in drafting the bill?

Answer. Early drafts of the bill were discussed with me and others in DOD. In the course of these discussions suggestions for changes were made by us, some of which were incorporated in the final draft.

5. Were you assisted by the military services or did you consult them during the preparation of the draft?

Answer. Some persons from the military departments assisted in formulating DOD views on the various drafts. These include both military and civilian.

6. Do you support the bill?

Answer. Yes.

7. What in your opinion are the major features of the bill which tend to correct deficiencies in the Space Act?

Answer. The new bill places responsibility for U.S. progress in space exploration and space flight as an end in itself in NASA rather than in a council at a higher level. This is primarily of benefit to NASA, and therefore can be discussed better by them.

8. The administration bill does not draw the military and civilian programs together with respect to centralized management and control of the national effort, especially with the recommended abolishment of the NASC. Do you concur in this divided management concept between DOD and NASA?

Answer. Yes.

9. When you divide the military and civilian space program, under the administration proposal, what mechanism is provided for setting priorities between those space programs directed toward national security and those directed toward the peaceful exploitation of space?

Answer. The NASA programs have space exploration and space flight per se as end objectives, the DOD space related programs are designed to exploit the capability of space flight for solving specific military problems, such as early warning of missile launchings, communications, and so forth. These objectives are so disparate from a functional standpoint that it is, in my opinion, wrong to attempt to place them all in single priority system based on environmental considerations. For example, the Midas program (early warning) priority should be set in accordance with military value of early warning and in relation to how well Midas competes with ground-based methods of achieving early warning. The priority of Midas has no more to do with the priority of lunar probes than it has to do with the priority of the Interstate Highway System.

10. The proposed legislation appears to create a sharp line of demarcation between civilian and military space programs. Do you feel that this can be done at this time?

Answer. Most programs can be fairly clearly designated as either civilian or military. There is, of course, a considerable gray area where such a designation is not entirely obvious. The responsibility for items falling in this area has been assigned to one or the other agency by executive agreement.

11. Many knowledgeable people, military, civilian, and scientific, are on record with this committee saying that at this time such a division is not clear. Can you explain to the committee why you see this clear military-civilian program separation?

Answer. The division is not perfectly clear in all cases. It is, however, clear enough in the majority of cases so that it is easily feasible to handle the remaining cases by means of separately arrived at executive agreements between the two agencies.

12. Is it not possible under the administration bill that the NASA may find it necessary to create large facilities in support of this clearly defined civilian program?

Answer. If the NASA program grows beyond the point where it can be supported by available DOD facilities plus presently existing NASA facilities, then it will indeed need to create large facilities in support of its program.

13. It would appear to the committee that the split between military and civilian space programs as defined by you, Dr. York, has a great potential for duplication of manpower, money, and facilities. What do you think?

Answer. The presently planned programs of NASA and DOD do not duplicate each other.

14. If the Defense Department will continue to provide support to the NASA as you describe, is this not a marriage of military-civilian programs in an area which requires many millions of dollars and the effort of military forces in support of the civilian program? This clear line of demarcation which you described previously between civilian-military programs is not quite clear to the committee in the light of your support explanation; would you please restate it?

Answer. Use by NASA of DOD support facilities (i. e. ranges) does not, in my opinion, constitute "a marriage of the military-civilian programs." It is simply the fastest and most economical way to make progress.

15. What mechanism exists in DOD to insure the proper support of NASA programs?

Answer. A permanent mechanism for handling the support problem has not yet been established. However, satisfactory interim arrangements do exist; for example, NASA deals directly with the range commander for support of its launch requirements, and a special arrangement has been made in the case of Project Mercury, in which case General Yates, who is also commander of AMR, has been designated coordinator for all DOD support for Project Mercury.

16. Do you know of any formal mechanism within NASA to support the military space program?

Answer. At the present time, support by NASA of DOD programs consists of their carrying out certain booster developments which may be, eventually, of use in military as well as civilian programs (e.g., Saturn and Centaur). In each case there is a joint ad hoc committee whose purpose is to assure that potential DOD requirements will be met.

17. If the CMLC is abolished as proposed how do you visualize that proper liaison and assessment of program potential will be obtained? Has DOD reorganized to accommodate for this?

Answer. The CMLC would be replaced by a series of boards or committees dealing with the various matters of mutual interest such as space vehicle development, auxiliary power supplies, and so forth. In fact, such committees already exist and are even now the principal liaison mechanism between the two agencies.

18. The committee has knowledge of the fact that former Secretary of Defense Neil H. McElroy asked Mr. Walker L. Cisler, president of Detroit Edison Co. to make a study of the operation and management of the support program of the missile and space efforts of DOD. It is also understood that NASA participated since it appeared difficult to separate their support requirements from those of the DOD. Can you tell the committee what Mr. Cisler's findings and recommendations were?

Answer. In brief, Mr. Cisler recommended that an office be set up which would establish launch schedules at the various ranges and, using these, determine what new facilities, if any, were needed to support the programs using the ranges and space tracking facilities. The DOD recognizes the need for a mechanism for firm overall coordination of range and space tracking support facilities and is considering Mr. Cisler's recommendations as one of various possible means for accomplishing this objective.

19. Have you taken any steps to implement these findings and recommendations? If so, what?

Answer. We have concluded that some mechanism is needed to provide firmer central control over the ground support facilities for missile and space operations. We are studying Mr. Cisler's proposal along with other possible arrangements. We have not yet implemented any of these.

20. As Director of Defense Research and Engineering you are in a position to review and approve research, development, test, and evaluation programs proposed by the three military departments. Is this not so?

Answer. Yes.

21. Are you also in a position to review and approve the weapon system proposals of the three military departments which they submit as necessary in carrying out their roles and missions?

Answer. Yes, insofar as their technical aspects and feasibility are concerned. However, determination as to their military value, assuming they are technically sound, is made by the military authorities.

22. Are you also influential in determining the quantity of weapons to be procured as well as the quality?

Answer. By virtue of my authority as Director of Defense Research and Engineering, no. However, as a member of the Defense Secretariat and the Armed Forces Policy Council, I do from time to time participate in discussions involving quantity of weapons.

23. Would you not say, then, Dr. York, that you in effect control what the roles and missions of the Army, Navy, and Air Force really play in national security?

Answer. No.

24. The title Director of Defense Research and Engineering does not appear to adequately describe your sphere of authority Dr. York. Can you explain to the committee how all this authority gravitated into your office?

Answer. I think my title does adequately describe my sphere of authority. What authority I have did not gravitate to my office but was clearly spelled out in the Reorganization Act of 1958.