

Dr. York's statement to Armed Services Committee

April 20, 1971

TO: CITY EDITORS, NEWS DIRECTORS, MILITARY AFFAIRS WRITERS

Acting Chancellor Herbert F. York of UCSD will make the attached statement before the Senate Armed Services Committee in Washington, D.C. on Tuesday, April 20, 1971 at 10 a.m.

Release time for this statement will be 10 A.M. TUESDAY, APRIL 20, 1971

STATEMENT BY HERBERT F. YORK

SENATE ARMED SERVICES COMMITTEE APRIL 20, 1971

Mr. Chairman and Members of the Committee:

Our deterrent forces include three principal weapon systems: submarine launched missiles, land-based intercontinental missiles, and intercontinental bombers. These are augmented by certain medium-range bombers deployed in forward locations on carriers or foreign bases. These offensive weapons all depend on other systems for providing early warning of an attack, on various devices and methods for protecting them against being destroyed in a surprise attack, and on the hardware and software necessary for commanding and controlling the weapons in the event they must be used.

These deterrent forces have as their ultimate purpose the prevention of an attack by another nuclear power on our homeland. They are supposed to achieve this purpose by promising to wreak unacceptable revenge on any attacker. The probability that they will achieve this objective depends on what is usually called their "credibility." Our deterrent is fully credible if a potential attacker believes we really can and will inflict unacceptable revenge on him no matter what he does in the way of first destroying some large part of our deterrent forces in a preemptive strike and then subsequently defending himself against retaliation by those that remain.

The question of whether or not we need an ABM to defend, or a MIRV to augment, some part of our deterrent forces can be broken down into two further questions: first, what is the credibility of our presently existing and currently programmed deterrent forces without any ADM or NTIRV, and second, if this credibility is too low, is the introduction of an ABM or MIRV the best way to increase it?

In order to put these questions in their proper context, I shall discuss in some brief detail each of the key components of the U.S. deterrent forces as they now exist and as they are currently programmed for the next few years.

POLARIS/ POSEIDON

We now have a force of 41 missile submarines, each supplied with a store of sixteen missiles ready to be launched. These missiles have a range of about 1500 miles, and each one can deliver a single warhead having an explosive power of about one megaton. At any one time most of the submarines are at their battle stations but

some are in home port or otherwise out of position. The fraction on station can be increased in times of special stress.

We have recently begun the conversion of 31 of these boats to carry the new Poseidon missiles. These new missiles will have a range of approximately 2500 miles. They are even now being outfitted with MIRV warheads consisting of ten or more independently targetable nuclear weapons. With such MIRV warheads, the total number of individual weapons deployed in the Poseidon system will number over 5000. Even discounting all those not on station, there would remain several thousand warheads each of which would be ready to go on an instant's notice and each of which would contain an explosive power several times as powerful as the A-bomb that killed one hundred thousand people at Hiroshima.

The question of the credibility of the Polaris /Poseidon forces, considered by themselves, has usually been taken to involve two further questions: first, is the missile submarine fleet vulnerable now or in the foreseeable future to a surprise attack on it, and second, can any existing or currently programmed Soviet ABM system successfully cope with the Polaris and Poseidon warheads that would be expected to arrive on target even after a massive surprise attack on our submarine fleet?

I believe the answer to each of these questions is a resounding "NO". I conclude from this that our submarine missile forces by themselves constitute a thoroughly credible deterrent for the foreseeable future.

Anyone who has made even a cursory review of anti-submarine warfare (ASW) knows that at present it is extremely hard to find and destroy one nuclear submarine. To destroy 30 or 40 simultaneously is about as impossible as anything can be. As a result, a long line of Secretaries of Defense and Chiefs of Naval Operations have repeatedly stated their faith in the security of our Polaris and Poseidon forces. For many years now a great deal of research and development has been done on methods for finding and destroying submarines. Similar work has been done on how to prevent submarines from being detected and destroyed. Yet, after all this time and effort, there are still no signs whatever of any technological breakthrough that might really change the situation. And even if such a change should occur, it would be foreseen well ahead, and it seems likely that modifications in tactics and operating procedures could cope with the problem.

Because of its great importance this whole question has been repeatedly studied in depth by various groups of experts. To my knowledge, they have always arrived at the same conclusion.

What about the second question: Can any known ABM cope with the Polaris and Poseidon warheads that might be expected in a retaliatory attack? Certainly the 60-odd Galosh ABMs now deployed at Moscow cannot deal with the many hundreds of simple warheads in our current submarine missile force even if every ABM were to work perfectly. Thus for the present, and until the Soviets begin deployment of an ABM system much more extensive than the one they now have, MIRV warheads for Poseidon are quite unnecessary. Instead of deploying them now, the use of MIRV warheads might better be held in reserve until we see positive signs of an expansion of the Soviet ABM system. Then, even if the Soviets were to do a much better job on the ABM than they have done to date, and even if they were to deploy many thousands of anti-missile missiles, radars, and command and control mechanisms, we could still penetrate such a defense by installing MIRV warheads on our missiles and then suitably concentrating these warheads in space and time.

INTERCONTINENTAL BOMBERS

For the last several years the size of our intercontinental bomber force has been more or less constant at a level of approximately 600 aircraft. These aircraft are equipped with a variety of electronic and other devices designed to confuse or blind anti-aircraft defenses. They carry decoys to draw fire away from themselves and they carry stand-off missiles (such as Hound-Dog or STRAM) which can be used to roll back defenses or to reach through them to extremely heavily defended targets. And they can carry truly stupendous bomb loads. Regardless of whatever they may currently be programmed to carry, each B-52 aircraft can carry several bombs having a total of several tens of megatons of explosive power. (For comparison, the total explosive power used in all wars up to the present is of the order of ten megatons).

In an attempt to defend against an attack by our bombers, the Soviet Union has deployed a very extensive array of anti-aircraft forces. These consist of surface-to-air missiles, including the SAM-2s and SAM-3s we and our friends have gone up against in North Vietnam and Egypt, plus various interceptor aircraft and all the complex array of radars and command-and-control devices essential to such a system. The question of how many of our bombers could penetrate these defenses is indeed problematical from the point of view of both the defense and the offense. But in thinking about this question we must remind ourselves that defense against a nuclear attack is an entirely different matter from the defense against an attack with chemical explosives. It is easy to be misled by the experiences we have had with this latter type of attack in World War II and more recently in North Vietnam and Egypt. In the case of an attack using chemical explosives an attrition rate of only five or ten percent by the defense can be considered "successful". The reason for this is that each bomber must make many repeated trips in order to deliver enough explosive to accomplish the objectives of the offense, and an attrition of that small level is enough to prevent each bomber from carrying out a sufficient number of sorties. On the other hand, in the event of a nuclear attack, an attrition rate of ninety or ninety-five percent must be considered a "failure" since even one penetrating bomber can by itself completely destroy the largest city in the world.

A detailed analysis of how "credible" is the deterrence provided by our inter-continental bombers depends, as before, on two further questions: first, how many bombers can be expected to survive a surprise attack on them, and second, of those that do survive how many can be expected to penetrate Soviet air defenses?

The answer to the second question depends critically on the answer to the first. If the number of bombers surviving a pre-emptive attack, were in the hundreds, then I believe the number that would be able to penetrate Soviet defenses would be plenty large enough to wreak a grossly unacceptable level of damage. On the other hand, if the number surviving a pre-emptive attack were only some tens, the air defense task would become much simpler, and the bomber force considered by itself might not constitute a credible deterrent. However, in making even this last judgment, we should keep in mind the view expressed by McGeorge Bundy shortly after he left the position of Special Assistant to the President for National Security Affairs. Writing in 1960, in *Foreign Affairs*, he said: "In the real world of real political leaders - whether here or in the Soviet Union - a decision that would bring even one hydrogen bomb on one city of one's own country would be recognized in advance as a, catastrophic blunder; ten bombs on ten cities would be a disaster beyond history; and a hundred bombs on a hundred cities are unthinkable".

How do we intend to cope with a possible pre-emptive attack on our bombers, and does ABM have a role here?

This is a very complex question, and only a brief overview of the matter is possible here. It is usually assumed that such a pre-emptive attack would be made either by enemy ICBMs or by enemy sub-launched missiles. With currently deployed warning devices (radar) the dependable warning time in the former case is only fifteen minutes or so, and in the latter case, only about half that. With warning devices now beginning to be deployed (satellites), warning times against an ICBM attack should rise to about 30 minutes, and against a sub-launched missile attack to about 15 minutes. Possible means of defending against such attacks include wide dispersal of the bombers to many air bases, quick reaction to get off the ground in the interval between the warning of an attack and its actual arrival, maintaining at least a small fraction of the force on airborne alert especially in time of stress, and so-called active defense of the force by an ABM system. We have had real experience with all of these except ABM. We know they are difficult and expensive, we know they require well-trained personnel, but we also know they can work. ABM defense of bombers has of course, not been similarly tested, but we do know it is harder to accomplish than so-called hardpoint defense of missile silos. Aircraft are "softer" and can be destroyed, for example, by explosions at such high altitudes that interception becomes more difficult even in theory, to say nothing of in practice. As a result, I believe the uncertainty concerning ABM defense of bombers will always be so great that even if ABMs were deployed for this purpose, the Air Force would find it necessary to continue to employ all the other means of defense. Neither the money nor the manpower needed for these others would be reduced by the deployment of an ABM. Furthermore, in my judgment, the effectiveness of these other means of safeguarding our bombers would be little improved by the addition of an ABM. In sum, I do not see deployment of an anti-missile system around our bomber forces as an effective way of contributing much to the credibility of that component of our deterrent.

Because of the serious and incalculable questions about survival under pre-emptive attack and the subsequent penetration of the waiting defenses, most analysts would have strong doubts about the credibility of a deterrent consisting only of bombers. However, the combination of Polaris and Poseidon forces plus an intercontinental bomber force greatly complicates both a hypothetical pre-emptive surprise attack as well as the defense against the surviving weapons, and thus these two weapon types together compliment each other and make up for now and for the foreseeable future a highly credible deterrent.

MINUTEMAN AND TITAN- II

The most numerous component of the strategic forces of both the USA and the USSR presently consists of ICBMs of various types. Our ICBM force is made up of various versions of the Minuteman and the Titan-IT, and theirs consists of a number of types including most importantly the large SS-9 and the SS-11. Our Minuteman-III missiles are now prematurely being outfitted with MIRV warheads, and a MIRV for their SS-9 may be under development.

As with the other systems, the contribution ICBMs make to the credibility of the deterrent depends on the two further questions: first, how many would survive a surprise attack on them, and second, would a sufficient fraction of those remaining still be able to penetrate a hypothetical defense against them.

At present, and ever since they were first deployed in underground silos about ten years ago, our ICBMs have enjoyed virtual certainty of survival in the event of a surprise attack. For most of this period the Soviets have had fewer warheads than we have had missile silos. More importantly, the "hardness" of our silos set against the accuracy of their warheads has been such that one of their warheads has had only a very low probability of destroying one of our missiles. This "comfortable" situation is now changing for the worse. Secretary Laird, members of his staff, and DOD consultants have all pointed out how increasing numbers of Soviet missiles coupled with the introduction of "MIRV and improvements in accuracy and reliability can all combine in such a way as to make possible a theoretically successful pre-emptive strike against our current land-based missile system. Most of those of us who testified against the ABM in recent years agreed with that description of the trend of technology. In sharp contrast to the case involving the Polaris and Poseidon forces, in this instance one can see just how in theory the Minuteman force might become vulnerable one day. The disagreements were over the imminence of that state of affairs and over the proper reaction to it. Some defense officials and some defense consultants stated it very well might be possible for the Soviets to destroy (and have confidence in destroying) 95% of our Minuteman force by a pre-emptive attack as early as 1975. I doubted very much that the Soviets could or would depend on such a result before 1980 and did not expect such even then. But even if this figure could be achieved, would it result in gravely reducing the credibility of our land-based missile forces? Most analysts believe the 50 missiles that would remain would still be enough for deterrence unless the Soviets were also to deploy an extensive sophisticated ABM system in which they could have every high degree of confidence. I personally regard such a Soviet ABM as another very improbable event to be compounded with all the other improbabilities mentioned earlier, and so I do not take it very seriously.

But even so, it is prudent to study what can and perhaps should be done about this matter, and indeed many approaches have been carefully examined. The simplest thing that could be done would be to replace the present simple warheads with MIRVs having a high enough multiplicity to expand the threat and to guarantee penetration of a hypothetical ABM. As we all know, the Air Force is even now installing three-fold MIRVs on some of Minuteman-III missiles. This action has turned out to be premature; or rather, it is premature if the purpose of the Minuteman force really is deterrence.

Another approach to coping with the supposed threat of the SS-9 involves a variety of so-called rebasing schemes. These include such things as further hardening, the use of deception, and various forms of movement and mobility. Various versions of active defense through the use of an ABM system have also been studied. One of these is the notorious Safeguard system, originally designed for a different purpose under a different name and converted by executive fiat to this new purpose two years ago. In recognition of the inappropriateness of Safeguard for this new purpose, defense officials and defense scientists are now exploring various versions of a new ABM for what is called "hard-point" defense. This latter approach has the merit from the technological point

of view of being designed for the specific purpose of defending missile silos. It, therefore, will have a considerably higher probability of accomplishing its objective. I believe most of the hardliners would prefer now to abandon Safeguard in favor of Hard-Point Defense, but find it politically difficult to do so.

There are a number of versions of such hard-point defense systems and I don't believe that any have yet been costed out correctly. However, it is already quite evident that the versions with the highest probability of coping successfully are also by a wide margin the most expensive. For instance, increasing the ratio of defense radars to defended silos increases both the cost and the probability of working.

But cost aside, no ABM system can come near restoring the confidence we have enjoyed to date in the simple, sure protection provided by underground silos, or the confidence we will have for the foreseeable future in Polaris. All ABMs will continue to be plagued by the general concerns that have been expressed about them in these hearings in recent years; only the details will change. Any ABM can be overwhelmed by concentrating offensive warheads in space and time.

Any ABM is subject to the possibility of total system failure due either to a mistake on the part of our designers or to unanticipated cleverness on the part of theirs.

Thus, while a hard-point defense ABM can improve somewhat a seriously sagging credibility, it cannot restore it to its former level. Piling complication on top of complication may exhilarate defense technologists, but it will not make us more secure. Moreover, all these calculations about the vulnerability of Minuteman involve a series of compounded possibilities, not certainties, and Minuteman itself is only one out of three plus offensive systems, so just how frantically should we react to all this anyway?

It has been repeatedly asserted that we must have three major components in our deterrent forces and, therefore, even the possibility of a threat to Minuteman is treated as intolerable. The origin of this assertion about the three-fold deterrent can be found in the technological turmoil of the mid- 1950s. In those days no ICBM had ever been flown, and no large missile had ever been launched from under water. We were worried about whether the second state of Titan could be ignited successfully in outer space under conditions of vacuum and freefall. We didn't know whether the Polaris missile could achieve enough range to be useful. We did not know how well we could determine the position of a submarine, and we did not know how well we could determine the direction and distance to a target. We did not even know the shape of the earth with sufficient accuracy. The press carried flamboyant stories about how hard it was to design an ICBM warhead capable of re-entering the atmosphere at "meteoric" speeds. It made good sense then to have several parallel approaches to an objective when we could not be certain that any particular one would work at all. But today things are altogether different; we know for sure that Poseidon will work and we know it constitutes even by itself a highly credible deterrent. Adding intercontinental bombers to Poseidon makes the deterrent doubly credible, and there is no need to be frantic about what might happen at some uncertain future time to yet another backup system.

A no-ABM agreement at SALT

One further matter should be discussed at this point. Let us for a moment take seriously the current "worst-case analyses" of the future threat to our deterrent posed by the Soviet SS-9 and Soviet advancements in missile accuracy, MIRVing, etc. In that case, the time will come when only fifty or so Minutemen will survive a surprise attack. Of course, the number of surviving warheads could be multiplied by MIRVing if 50 were judged to be too few. The multiplication factor would be three using current designs, but probably as much as a factor of ten could be achieved if it seemed called for. Thus, as mentioned earlier, even this "small" residual surviving forces will constitute a deterrent unless the Soviets have an ABM which can cope with certainty with it. Again, I do not believe they can develop and deploy such an ABM, but suppose I'm wrong? In that case, clearly, the best way, and possibly the only way to be sure they won't have such an ABM is through a no-ABM agreement with the Soviets. Thus, a no-ABM agreement is not only a valuable first step in the direction of arms control and disarmament, it is also the best way to insure the continued credibility of our deterrent. And by assuring the credibility of both deterrents, theirs as well as ours, such an agreement provides an excellent means for

institutionalizing the deterrent and for avoiding a nuclear holocaust during this iffy period while we are trying to squeeze the nuclear djinni back into the bottle..

In summary:

1. Our Polaris and Poseidon forces armed with single warheads provide by them selves a highly credible deterrent. The only currently foreseeable technological event that could change this would be the deployment by the Soviets of an extensive sophisticated high-confidence ABM system. And even in that unlikely event, providing the Poseidon missiles with MIRV warheads would fully restore the desired level of credibility, a U.S. ABM has no bearing on this situation.

2. Our long-range bombers may not by themselves provide a sufficiently credible deterrent. However, combined with the Poseidon force, they do compound the credibility of the overall deterrent and should reassure those who would be worried by having "all our eggs in one basket". There are several ways to help assure the survival of the bombers in the event of a surprise attack on them. ABM is probably the least certain and perhaps the most expensive of those.

3. Land-based ICBMs form a secure part of our deterrent today, and they still further reinforce the high degree of credibility already provided by the other components. At some uncertain time in the future it may conceivably become possible for an enemy to destroy a very large fraction of them in a surprise attack and to defend against retaliation by the few that remain. Various possible technological solutions to this problem have been proposed. The simplest and most effective would then be to provide the ICBMs with MIRV warheads.

But none of the schemes studied so far, certainly including silo defense by ABM could restore the present high level of confidence.

4. A no-ABM agreement is the surest and best way to continue indefinitely anything like the present level of confidence in the deterrent value of our missile forces. A no-ABM agreement would leave MIRV unnecessary. A no-ABM agreement would constitute in itself a good first step in the direction of arms control and disarmament. For all these reasons a no-ABM agreement would seem to be an excellent first objective for our delegation to the SALT talks, and for anyone else interested in either American or Soviet national security.

(April 19, 1971)