

DECLASSIFIED
Authority EO 12958
By SLT NARA Date 10/21/00

*We must get PSAC out of #6019
strategy P
ABM*

MEMORANDUM

THE WHITE HOUSE
WASHINGTON

INFORMATION
January 5, 1970

SECRET

MEMORANDUM FOR DR. KISSINGER

FROM: Laurence E. Lynn, Jr. *let*

SUBJECT: PSAC Strategic Military Panel Comments on
Minuteman ABM Defense

*What do these
systems tell us
about upgrading
problem?*

Lee DuBridg has sent you a copy of the informal report of the
Chairman of the PSAC Strategic Military Panel on the panel's
review of hard point ABM issues. (Letter at Tab A.)

Jan 4 1970

In essence, it argues that for defense of Minuteman against the kind
of highly sophisticated counterforce threat we may face in the late
1970's, an ABM system using Safeguard components is inferior to
alternative systems now being studied by the Army's Ballistic Missile
Defense Agency (ABMDA).

The Panel received briefings on a variety of advanced concepts for
hard point defense, i. e., the R & D program the Army wants to run
on a large scale in FY 71:

-- There are a number of candidate systems. They differ from
Safeguard chiefly in having many more engagement radars per silo
defended. These radars should be cheaper to build than the Safeguard
MSRs and, more important, they reduce the vulnerability of the key
elements in the system.

-- According to the cost projections now being advanced -- which
are necessarily very uncertain -- the alternative systems do not differ
among themselves greatly in cost, and against the "baseline," i. e. 1974
predicted threat they are not cheaper than Safeguard. However, against
the "growth" threat, the alternatives would cost only 35-50% as much as
expanding Safeguard to the point necessary to continue to assure survival
of 300 Minutemen.

SECRET

DECLASSIFIED

Authority EO 12958

EX-107 NARA Date 6/21/00

SECRET

2

-- With the alternative systems, as with Safeguard Phase I or a Safeguard defense of Minuteman against the "growth" threat, it is the software, i. e., the data processing and command and control system, which creates the most uncertainty about costs, feasibility and completion dates. However, the data processing requirements for the alternative systems would be generally less than for the Safeguard system.

The report makes an interesting observation on timing:

-- If the "baseline" threat exists in 1973-76, "the U.S. will experience . . . a gap during which we cannot be confident that 300 Minuteman will survive The existence of Safeguard Phase I in no way mitigates this conclusion. The ABMDA analysis showed it to increase the surviving Minuteman force by no more than 20 missiles." It is, of course, equally true that none of the alternative hard point defense systems would help during that period because they would not be ready.

I find this report a troubling straw in the wind from the point of view of any FY 71 deployment decision which emphasizes Minuteman defense as a rationale:

-- It suggests that on the merits, there are strong technical arguments against any further deployment of the Safeguard components for Minuteman defense.

-- Whatever may be the substantive validity of the technical arguments, this paper -- prepared almost exclusively on the basis of ABMDA briefings -- suggests that the Army, in pushing its alternative hard point defense concepts, is vigorously poormouthing the Minuteman defense potential of Safeguard. If -- or rather when -- that fact leaks, it could significantly strengthen the opposition's arguments not only against expanding the system, but even against the Phase I decision.

Attachment

SECRET

DECLASSIFIED

Authority EO 12958

By *LWT* NARA Date 6/21/00

RANDUM

THE WHITE HOUSE

WASHINGTON

SECRET

December 30, 1969

MEMORANDUM FOR

Henry Kissinger

I have received the attached letter from Dr. Sidney Drell,
Chairman of the PSAC Strategic Military Panel which I
believe will be of interest to you.


Lee A. DuBridge
Science Adviser

Attachment
S&T Control No. 1487-cy 1-B

Unclassified when separated
from enclosure

SECRET

DECLASSIFIED

Authority EO 12958

By SLT NARA Date 12/21/00

STANFORD UNIVERSITY

ACCELERATOR CENTER

SECRET

Mail Address

SLAC, P. O. Box 4349

Stanford, California 94305

December 23, 1969

Dr. Lee A. DuBridge
Science Advisor to the President
Office of Science and Technology
Executive Office Building
Washington, D. C. 20506

Dear Lee:

During the fall your Strategic Military Panel of PSAC has heard briefings by the Safeguard Project Office on the progress of the Safeguard (Phase I) program for defense of Minuteman silos and has reviewed proposals for alternate technologies involving upgraded air defense radars and missiles as well as multiple internetted radars and more advanced interceptors designed to accomplish hard site defense (HSD). In addition to these briefings subpanels visited contractors engaged in HSD studies for more detailed discussions of critical problems, in particular those concerned with data processing and threat tube sorting requirements. These activities were undertaken in response to your charge to the Panel to provide technical input to you and the Administration prior to the impending FY-1971 decision as to a follow-on program to Phase I for an expanded HSD ABM system. We have now completed our review with a technical discussion with ABMDA (Army Ballistic Missile Defense Agency) and representatives of DDR&E during the morning of December 19. This letter is a chairman's report summarizing as best I can the general panel conclusions. In view of the fact that (a) it was impossible for us to receive and to discuss the output of the ABMDA study of alternate technologies for HSD at an earlier date since this study has just now been concluded and (b) an Administration decision is imminent on this problem we felt that this form of a chairman's report is the only practical input for us to have at this moment. (Should a more detailed Panel or PSAC report be desired in early 1970 we are of course prepared to submit one.)

SDD-69-4

DECLASSIFIED

Authority E.O. 12958

By *[Signature]* NARA Date 10/21/00

SECRET

DuBridge

- 2 -

December 23, 1969

Our general conclusions are as follows:

- 1) A hard site defense designed to preserve no fewer than 300 Minutemen missiles against a postulated and greatly enhanced Soviet threat in the post 1976 time frame is very expensive.

The Soviet counterforce threat for the purposes of the analyses was assumed to be very much larger than that presently in existence. At present there are some 240 RV's on launchers which are credible silo attackers (all SS-9's). In the ABMDA analyses this counterforce threat grows to a "baseline threat" by mid 1974, the initial deployment date for Safeguard Phase I, of 1500 RV's including both SS-9's and upgraded SS-11's each with a kill probability of $P_k = 0.9$ against a Minuteman silo. Characteristics of the baseline threat include reentry profiles with $\beta^I = 600$; S-band radar cross sections $\beta^II > 0.1 \text{ m}^2$, and reentry angles $\gamma = 15 - 35^\circ$. The "growth threat", should arms talks fail, grows in 1977 to 3000 RV's which are credible silo attackers with $\beta = 1500$; radar cross sections $> 0.005 \text{ m}^2$ and $\gamma = 15 - 35^\circ$. Against this growth threat, it costs a minimum of \$8 - \$10B to deploy a system protecting 300 Minuteman silos, or roughly \$30M per successfully defended silo. The corresponding figure for the "baseline threat" is \$15 - \$20M per silo.

On the other hand the Soviets would have to invest a comparable or greater sum to develop, ²deploy, and maintain the greatly expanded ICBM force capable of destroying all but 300 Minutemen. On the basis of cost trade-offs alone, HSD though expensive cannot be ruled out at this time as a favorable path for the U. S. to follow in order to maintain the Minuteman component of our deterrence.

- 2) Various internetted proliferation radar concepts were considered for which the ratio of the number of defended silos to engagement radars varied from 1:1 to 17:1, with the radars in either fixed or mobile deployments, and for which the cost figures as presently perceived

SECRET

DECLASSIFIED

Authority EO 12958

By SPW NARA Date 10/21/00

DuBridge

- 3 -

December 23, 1969

are quite comparable to one another. However the cost of such dedicated HSD systems was as low as 35% to 50% of the costs of the system built from current or derivative Safeguard components and with MSR's to protect 300 Minutemen against the growth threat. Against the baseline threat the systems costs appeared to be generally comparable. These figures discount the Spartan missiles and PAR radars as of no value in the HSD role.

- 3) Concerning the question of time urgency, should the baseline threat develop as described above leading to 1500 credible silo attackers by 1974 from the present 240 (as a result of SS-9 MIRV'ing with 6 RV's each and of SS-11 accuracy upgrading to a CEP of 1/4 n. m.), the U. S. will experience during the mid 1973-76 time frame a gap during which we cannot be confident that 300 Minutemen will survive to constitute one independent component of our three element (Minuteman plus Polaris-Poseidon plus SAC bombers) retaliatory force. The existence of Safeguard Phase I in no way mitigates this conclusion. The ABMDA analysis showed it to increase the surviving Minuteman force by no more than 20 missiles.
- 4) It follows from the above that the expenditure of an additional \$1B to continue Safeguard Phase I in FY' 71 cannot be justified on grounds of hard site defense alone.
- 5) Software developments are the pacing factors determining the date of initial deployment of the various HSD concepts under consideration, as they also are at present for the Safeguard Phase I program. This reflects the very high data processing requirements for all of the alternative missile defense concepts. These requirements vary from roughly 10 MIPS (Million Information Processes per second), which presses the present state of the art, to roughly 35 MIPS as required against the growth threat by a Safeguard system with MSR's.

In addition to the above conclusions several important recommendations are offered:

- 1) The Panel is well impressed by the ABMDA study at this stage. This work in progress should be continued.

DECLASSIFIED

Authority

EO 12958

By *SLT*

NARA Date 10/21/00

Page 4 of 4 pages

DuBridge

- 4 -

December 23, 1969

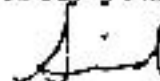
- 2) The continuing studies should not yet focus down onto too narrow a range of candidate systems for HSD but should still explore a broad spectrum of systems concepts. Possibilities for further study include a mixed defense such as one large radar, perhaps an MSR or smaller, per Minuteman squadron backed up by a proliferation of smaller single silo radars. Another concept might be to deploy a single silo defense, with one radar per defended silo, and to have the "hardness" of the radar increase in pace with a growing threat.

Relative costs in the ABMDA study are sensitive to assumptions about computer and software expenses and these can change drastically by the 1975 time frame if one is willing to anticipate sizable cost reductions in data processing accompanying the rapid strides in the development of the computer industry. Therefore firm decisions based on costs may be misleading. In particular single silo defense concepts should not be abandoned in comparison with the currently favored concepts in the ABMDA study which take 10:1 or 17:1 as the ratio of numbers of defended silos to radars.

- 3) The baseline threat, which is based on the assumption of vastly increased Soviet ICBM capabilities for counterforce, leads in 1974 to a gap in our Minuteman retaliatory force below the desired minimum of 300 missiles as noted earlier. The problem of devising solutions for closing this potential gap is not being addressed at present. Such a study should be undertaken at once.
- 4) Since all the ABMDA analyses reveal HSD to be a very expensive proposition other schemes that may be cheaper and perhaps quicker to deploy, such as alternate basing of the land-based missile force, should also be explored in depth.

If there is anything more we can do for you on this subject, please let me know.

Sincerely yours,



Sidney D. Drell, Chairman
Strategic Military Panel

SECRET