attachment is "Whither Ballistic Missile Systems" of Mar 4 (1 & 4 b)

March 8, 1958

Dear Mr. President:

The Ballistic Missiles Panel associated with my office, and conducted under the chairmanship of Dr. George Kistiakowsky, has completed another of its periodic reports of the missile program, and I enclose a copy. In this letter I summarize the recommendations made by this Panel and present comments and suggestions based not only upon the Panel's report, but on a recent visit by me and others to the various ballistic missile development and production centers.

Before presenting detailed comments on the missile programs, may I first make the following observations.

A. Technological progress to date indicates the feasibility of greatly improved programs for a second generation of ballistic missiles. Because plans and programs are now being formulated for such a generation of missiles, it seems urgently desirable to have a careful overall review of our missile program in the light of new opportunities for improved missiles and a better understanding of the technological possibilities and limitations which will affect our programs. Such an overall review should also take into consideration:

1. The size of the overall force necessary to meet military requirements.

2. The type of basing concept which will lead to the strongest deterrent force. The problem of foreign bases may now warrant re-examination since it is such an important factor in our planning of missile production and improvement.

3. Relative cost estimates of competitive ballistic missiles systems. This is of special importance at the present time for IRBM systems.

4. The effective strategic choices which we have or may have. Obviously the missile program can not be planned without

15-1091-5

relating it to other parts of our deterrent force and our overall strategic planning.

Such a review would seem to be essential, to cite one example, in order to arrive at a decision as to whether there should be an augmented Polaris program or a large Minuteman program or a mixture of both.

B. It is important not to commit ourselves to new missiles systems until adequate development work has been done on the missiles. It is dangerous to plunge into rigidly fixed hardware and development programs without due allowance for advance development. Crash programs without proper advance development are likely to be more expensive and may require more time and in addition may produce a marginal weapon.

C. It is important that enthusiasm for second generation missiles not be permitted to interfere with our carrying through sound first generation programs now under way. I feel strongly that we should achieve an impressive missile retaliatory capability as early as possible.

D. Of urgent importance is the need for a well-conceived basic research effort on solid propellants. The existing development program should be substantially augmented and in doing so, existing experimental groups should be strengthened by bringing in more top scientific talent. We should not rest important decisions about second generation missiles or important programs on inadequate assumptions about the performance of solid propellants.

E. In order to achieve an overall review of our missile program and evolving programs and plans, it is of obvious importance that there be a strong central mechanism for the management and planning of our missile program. Because of the tremendous importance to National Security of impending decisions on the missile program, I venture to suggest that there be a review at the Presidential level after adequate studies by the Department of Defense have been made. This procedure will permit an integration of the many factors -- political, military, technological and economic -- which should be weighed in reaching decisions and making future plans.

Let me now turn to more specific recommendations.

A. <u>The ICBM Program</u>

1. It is our judgment that, without delaying the existing Titan program, we should immediately institute a program of

improvements on the Titan missile. This missile, which offers many advantages over the Atlas, is the ICBM which warrants "product improvement." For example, we believe it highly desirable to proceed as rapidly as possible on an augmented development program to achieve storable propellants for Titan.

2. It would seem desirable to plan on phasing out of the Atlas missile as soon as consistent with an adequate rate of buildup of the total ICBM force. In association with this decision, there should be a planned phase-in of an improved version of Titan on hardened bases in 1963 or late 1962.

3. Missiles with solid propellants offer many advantages because of their simplicity of design and operation. It is important, however, if we are to have solid propellants in ICBM missiles, to make further headway in the development of solid propellants. This development program, as I have already suggested, should be substantially augmented and in doing so existing experimental groups should be strengthened by bringing in more top scientific talent. We strongly recommend that the Department of Defense reinforce immediately an advanced development program on solid propellants.

4. In considering the proposed IRBM and ICBM Minuteman program of the Air Force, we suggest that any decision for the building of actual "hardware" be postponed until better propellants and other components are in sight. We certainly should not enter into hardware programs without a clear consensus on the likely performance characteristics of the solid propellants to be used. I believe that crash programs in which we commit ourselves to specific designs without adequate development can in the long run delay the achievement of reliable missiles.

5. We believe that there is great advantage in having mixed forces of missiles, as for example, a combination in the future of Titans, Polaris, and possible Minuteman missiles, since the combination reduces the vulnerability of our retaliatory capability and greatly increases the problem of the enemy in countering such missiles. If the development work on the Minuteman missile proves to be promising, we believe that a plan to phase in the Minuteman in about 1965 would be sound.

B. IRBM Program

1. We repeat our previous recommendation, based on a technical appraisal, that we not produce both Thor and Jupiter.

2. We believe it important now to undertake a detailed study of three important factors which are important to decision making with respect to future IRBM systems:

a. The relative cost of competitive IRBM systems.

b. Relative ability to survive surprise attack and other operational aspects of fixed and mobile land-based missiles and the submarine system.

c. Political factors affecting the use of land-based, submarine-based missiles.

A better understanding of these factors seems essential in order to arrive at sound conclusions as to which missile systems to select or how to determine the number of each type of missile. The importance of such considerations to specific missile systems is discussed in detail in the accompanying report.

3. We recommend initiating an improvement program on Thor, looking toward a missile with more than 2000 n.m. range provided there are good political prospects for suitable bases.

4. We suggest that consideration be given to the desirability of developing a land-based, solid propellant IRBM for eventual replacement or implementation of the Thor force. This could evolve out of either the Polaris or Minuteman programs.

In making these suggestions and observations, I recognize, of course, that the Department of Defense is giving careful study and consideration to most of them. In this letter and in the accompanying report, we do not presume any competence in fields which fall outside of the scientific and

technological domain, but we do feel that there are vitally important non-technological factors which must interlock with technological considerations if we are to arrive at sound decisions and plans.

Respectfully,

J. R. Killian, Jr.

The President
The White House
Washington, D. C.