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REPORT TO: The President's Science Advisory Committee

FROM: Missiles Panel

SUBJECT: The Skybolt Air-Launched Ballistic Missile Program

12 July 1960

Introduction

1. In January 1959 the Air Force issued a General Operational Requirement for an air-launched ballistic missile with the following characteristics: Carry capability by B-58, B-52 and United Kingdom V-bombers; range of 1,000 n.m. following launch by a B-52; target overpressure relationships established by [redacted] equippage in operational units not later than 1963.

2. Subsequently, the technical feasibility of the missile was studied by an ad hoc DOD committee chaired by Dr. James Fletcher. That committee concluded the aforementioned requirements could not be met on schedule, if at all, but that a missile could probably be built to meet the following less demanding requirements: [redacted] or, alternatively, [redacted]; initial operational capability in 1964. The Fletcher committee also concluded that the Air Force cost estimates were unrealistically low, that the R&D costs would probably be about 1/2 billion dollars, i.e., about three

times the Air Force estimates, and that the total costs would run one to two billion dollars for a 1,000 missile program. The Fletcher committee did not address itself to the questions of operational employment and need for the Skybolt or comparative merits of the Skybolt and other missile programs.

3. The Missiles Panel has reviewed the Skybolt program and at this time believes that the findings of the Fletcher committee with respect to technical feasibility and cost estimates are probably still valid. However, the Panel has also addressed itself to the question of the comparative merit of the Skybolt and other programs and on the basis of this, has serious doubt about the wisdom of continuing Skybolt.

Discussion

4. It is expected that the missile might be employed to destroy comparatively soft primary targets which are sufficiently defended so as to make direct attack by bombers difficult or impossible, or alternatively, the Skybolt might be used to reduce enemy defenses to permit penetration by bombers to primary targets, the destruction of which is best accomplished by delivery of large weapons with small CEP. Other missiles, e.g., Minuteman, either fixed or mobile, based in the U.S. can also be used for either purpose. For the latter role, i.e., reducing defenses, Skybolt may have some advantage in that coordination of attack against defenses and the bomber penetration

may be somewhat simpler if the missiles are launched from the bomber. The Panel is inclined to view this as a marginal advantage which will be at least partially compensated by the fact that bomber range and/or payload could be increased if the missiles were not carried on the aircraft.

5. The Skybolt/B-52 combination can, of course, be deployed with the aircraft on either ground alert or airborne air alert. In the ground alert mode, its effectiveness is entirely contingent on receipt of, and response to, early warning. Because of the great uncertainty with respect to the adequacy of such warning, it is difficult to compare the B-52 Skybolt combination with such mobile systems as Polaris or train-based mobile Minuteman, which need not depend on early warning, or with the fixed missiles which one would not like to fire on the basis of early warning because of the impossibility of recall. It is perhaps worth pointing out that the ground alert Skybolt/B-52 combination will probably be a somewhat less expensive system on a per missile year basis than the mobile systems, though this might well not be true if some of the costs of the warning system were charged to Skybolt; it will be more expensive than the hard dispersed Minuteman on a per missile year basis.

6. If the Skybolt/B-52 combination is kept on continuous airborne alert, it can be assumed that it will survive surprise attack, and in that case comparison with the other mobile systems, at least, is more straight-

forward. Costs on a per missile year basis for the airborne Skybolt/B-52 combination will probably be at least as great as for either mobile Minuteman or Polaris. Because the [redacted] on the other, the Skybolt cannot be expected to pose any significant new problem for Soviet anti-missile defense systems, should such systems be deployed. The Air Force has argued that Skybolt will pose a new threat in that it will force a 360° defense of each point target since the aircraft may approach from any direction. The Panel believes this argument is unsound. By the time Skybolt is operational, the Soviets will probably have to face the prospect of Polaris submarines operating from the Indian and Arctic Oceans, as well as the North Atlantic and Mediterranean (and also perhaps the possibility of mobile NATO IRBM's and of ICBM attacks from the "long way around") so that a 360° defense will be required anyway. In fact, the Panel believes that the Skybolt may be a less serious problem for Soviet defenses than the mobile Minuteman since it will probably be more difficult to coordinate fire so as to saturate defense capabilities.

7. It is true that the Skybolt/aircraft combination would confront the Soviets with one more mobile system which they would have to try to cope with before missile launch (assuming an imperfect ballistic missile defense.) Against mobile Minuteman trains the Soviets could use

ballistic missiles, but this requires either very good intelligence or a very large blanketing barrage. Against Polaris submarines, ASW would be needed. Against the airplanes, long-range interceptors and airborne early warning could be used. Of these problems for the Soviets, the last seems the easiest, particularly considering the limited range of Skybolt and the fact that by the time it could be operational, Polaris will probably have a 2500 n.m. range.

8. Should it be decided that another mobile system is needed, it is by no means clear that Skybolt is to be preferred. The Hound Dog, which we are now procuring, will pose a serious problem for Soviet air defenses. By 1964-65, when Skybolt is supposed to be "operational," the present version of Hound Dog will have have seen four to five years of operational use. Advanced versions of this missile could be developed and deployed during this period, and because of the experience with Hound Dog, could be expected to have a higher reliability than Skybolt. Further advances in supersonic low-altitude aerodynamic missiles would probably be a logical evolution out of the basic Hound Dog program. Such high-speed, low-altitude devices would, in the Panel's opinion, create a greatly expanded--if not a wholly new--air defense requirement to the Soviets. Even though our aircraft may pose a significant low-altitude threat, such advanced missile developments would greatly aggravate their defense program. Skybolt, by itself, as pointed out above, poses no new requirements for defense capabilities.

9. The Panel is aware of the fact that cancellation of Skybolt may possibly result in embarrassment to the United Kingdom, in view of the fact that its development appears to have been used as a rationale for cancelling Blue Streak. While we have not examined it in any detail, we would point out, however, that the case for Skybolt for the RAF appears weak anyway. Their bombers have such short range that an air alert is almost certainly out of the question for them, and they are less likely than we to have early warning that will be adequate for a ground alert. It may be noted, however, that various conversations, agreements, and the interchange of personnel between the U.K. and the U.S. are having, and will continue to have, the effect of solidifying and deepening the U.S. commitment to the U.K. in connection with this program as time progresses.

Conclusions

10. In view of the number of other missiles that will be available in the mid and late sixties (including two other mobile systems), the Panel questions the need for another system that does not confront the enemy with a significant new defense problem. Serious consideration should be given to cancelling Skybolt before more effort and money is expended. (Two to three percent of the total expected system cost has so far been spent.)

11. Low-altitude aerodynamic air-launched missiles would seem to be a more promising line of development than air-launched ballistic systems. Even if Skybolt should be continued, we feel that R&D on low-altitude aerodynamic missiles should be pushed.

12. If it is decided that Skybolt should be continued, it is important that it be pushed as rapidly as possible, particularly so that we can capitalize on what may turn out to be a relatively short useful life. To achieve even the 1964 operational date will require really first-rate management.

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