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AIR FORCE BALLISTIC MISSILE DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND

WDTP

29 January 1958

MEMORANDUM FOR COLONEL TERHUNE

SUBJECT: Sentinel Force Requirements

1. The purpose of this memorandum is to state our views on the force requirements for the solid ICBM (Sentinel). These views are based on considerations of strategic capabilities only and exclude factors such as development, production, facilities construction, personnel training, etc.

2. The following assumptions and conditions are used in developing our views on this subject:

a. The primary mission of the Sentinel weapon system is to deter general war.

b. The U.S. capability to destroy 135 enemy cities, even if the enemy strikes first, will deter the enemy from deliberately initiating a general war.

c. Destruction of 75% of the floor space (this corresponds approximately to 75% population mortalities) will constitute city destruction.

d. The year 1965 is the time period of interest for determination of total Sentinel force requirements.

f. The enemy will have the capability to attack the Sentinel system with 900 missiles on target, each with 5MT yield and 2NM CEP. (This is from intelligence numbers estimates tempered with our judgement on yield, accuracy and reliability)

3. From these conditions it is possible to calculate that 600 Sentinels would need to survive an initial enemy attack. (400 would be required at the enemy targets.) From the given enemy capabilities and Sentinel hardness and dispersal it can be shown that in order for the 600 missiles to survive it would be necessary to have about 700 in the force. Thus, from the assumed Sentinel mission and the best estimate of Sentinel characteristics and enemy capabilities it is concluded that 700 Sentinel missiles would be required in the force in 1965.

4. I believe this figure has some margin of safety in that the destruction of 75% of the floor space of 135 cities is a severe criterion and the assumption that the enemy will use all his missiles against the Sentinel is a rigorous one. However, additional factors of safety may be incorporated by making the following alternative assumptions:

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
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a. The enemy can deliver 3000 missiles on target instead of 900.

b. The Sentinel is hardened to 50 psi instead of 200 psi and has a 50% overall system reliability instead of 75%.

5. Under these conditions 800 Sentinels would need to survive enemy attack. With the increased enemy capability and reduced Sentinel protection this would require 1850 Sentinels in the operational force.

6. In summary, based upon the best estimates of the parameters involved, the Sentinel force should have 700 missiles by 1965. Revising the best estimates to incorporate factors of safety leads to a Sentinel force size of 1850. Although numbers in excess of 2000 might be justified as additional safety factors it is my opinion that this would be difficult under close scrutiny.

7. This reduction by a factor of two in the numbers which have been discussed may not be too important from an overall cost standpoint, but it may significantly ease the problems associated with meeting missile and component production schedules and facility siting and construction. This could make a difference in justifying the program.

(SIGNED)

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