STATEMENT ON

THE PRESIDENT'S STRATEGIC DEFENSE INITIATIVE

BY

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As Chairman of the Directed Energy Weapons Panel of the Defensive Technology Study Team (DTST), I, along with my colleagues from industry, government, and national laboratories, had the opportunity to review and evaluate the status of the threat and our present defense technology research programs, and then to prepare a plan for the future. This plan described a program of research, technology development, and demonstrations to provide future options for achieving enhanced deterrence through defense against ballistic missiles. Many of us were skeptical about our present state of defensive technology, but were equally skeptical about our apparent commitment to assured retaliation for the indefinite future. We sought a combination of technology and strategy that could lead to a more stable strategic equation. Until now, offensive initiatives have caused further responses involving increased offensive capabilities. With truly credible defensive technology, we could, hopefully, make a shift to a strategy that would make further offensive escalation unattractive.

We began by evaluating not only the present threat, but assumed that the threat would be modified in a responsive way. We were forced to postulate not only a robust defense, but also a very capable and determined offense. The difficulty was to evaluate the moves and counter-moves in a complex scenario that might lead to a favorable solution. The optimists and pessimists among us saw things quite differently, but we did agree that there were still too many unknowns to shift away from an offensive dominated strategy now. The program we developed was, therefore, not one of early deployment, for we concluded that their initial response would be to successfully countermeasure our near term defense capabilities. We considered responses that included the following: proliferating boosters, RVs, and penetration aids; extensive hardening; modifying boosters to burn out earlier and at lower altitudes; and attacking our space

defenses. We knew that a capable defense would introduce enough uncertainty in the success of an offensive strike to serve as a deterrent; however, a capable defense would require very substantial increases in the capability of all elements of our ballistic missile defense technology.

The study team defined the key technology building blocks and identified the highest leverage aspects for early emphasis:

1. Target acquisition, discrimination, and tracking; weapon pointing, and kill assessment.

2. Battle management computers and software; C^3.

3. Survival of space assets and verifiable lethality against hardened targets.

4. Kinetic energy weapons; directed energy weapons and power supplies.

5. Utility and cost exchange assessment including implications of countermeasures and arms control.

As one can readily see, although beam weapons get a great deal of publicity, they only constitute one portion of the program. Nevertheless, directed energy, or "speed of light," weapons are on the critical path to a successful capability to counter missiles shortly after they are launched, the boost phase. Because of the limited time for engagement over vast areas, an ideal booster kill weapon should have long range, high rate of fire, and provide a "low cost" and verifiable kill. A favorable cost exchange is needed to discourage further increases in the number of boosters. Fortunately, a burning booster is a bright object, difficult to decoy, and may be difficult to harden against a capable beam weapon. The following types of

beam weapons were considered: (1) space based lasers, (2) ground based lasers, (3) space based particle beams, and (4) nuclear directed energy weapons.

For each of these approaches, there were critical unknowns that demanded additional experimental and theoretical research in order to defeine their present limitations and ultimate potential. The figure of merit that applied to all of these concepts was the beam brightness, i.e., that power or energy that could be directed in a pencil-thin beam. For a laser, this is determined by the power of the laser, its wavelength, and the size, quality, and pointing accuracy of its optics. We found that there was considerable room for improvement in many of these characteristics. Optimistically, we concluded that we could achieve the needed parameters, but only a concerted effort would give us the definite answers. For particle beams and nuclear driven weapons, there were similar as well as new questions and the program plan was developed to resolve the key technical issues.

Thus, we envisioned pursuing a broadly based, but highly goal-oriented science and technology program. The activity will take several years and will make severe demands on our technical creativity and dedication. It is likely that there will be surprises including setbacks as well as favorable discoveries of new and innovative approaches. The implications of this evolving technology and its relation to strategy and policy will also have to be reevaluated as we proceed. As we learn the limits of the technology and the threat response, there will be a constant winnowing process. Our emphasis will focus on the optimum approaches as the design objectives become fixed and the technical elements are proven at a suitable scale. The desired approach will be to avoid costly mistakes in the engineering prototype phase through a complete assessment at theend of the present research phase.

We cannot now make the decision to deploy or even to begin to produce a defensive weapon system, but we should work toward an informed decision on whether to embark on the engineering phase in the next decade. We don't see fundamental reasons why it can't be done, and with the enthusiastic involvement of our technical community in meeting this challenge, we may even find that nature will make the road easier than we now envision. If that happens, then we can, before this century ends, begin to construct a more stable future wherein assured retaliation is constrained and balanced by systems which are defensive.

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