Section 10

PRINCIPAL JUDGMENTS AND OBSERVATIONS

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1. The prospect that emerging "Star Wars" technologies, when further developed, will provide a perfect or near-perfect defense system, literally removing from the hands of the Soviet Union the ability to do socially mortal damage to the United States with nuclear weapons, is so remote that it should not serve as the basis of public expectation or national policy about ballistic missile defense (BMD). This judgment appears to be the consensus among informed members of the defense technical community.

Technical prognosis for such a perfect or near-perfect defense is extremely pessimistic because of the concentration and fragility of society; because all concepts identified as candidates for a future defense of population are known to be susceptible to countermeasures that would permit the Soviet Union to retain a degree of penetration with their future missile arsenal despite costly attempts to improve the U.S. defense; because the Soviet Union would almost certainly make such a determined effort to avoid being disarmed by a U.S. defense; and because missile defense does not address other methods for delivering nuclear weapons to the United States.

Mutual assured destruction (MAD), if this term is applied to a state of technological existence rather than to a chosen national policy, is likely to persist for the foreseeable future.

2. **The wisdom of deploying less-than-perfect ballistic missile defenses remains controversial.** Less-than-perfect defenses would still allow the Soviet Union to destroy U.S. society in a massive attack but might call into question the effectiveness of smaller, specialized nuclear strikes.

Certain theories about nuclear war maintain that such defenses could lessen the chances of nuclear war and enhance U.S. security by protecting U.S. retaliatory forces; by interdicting "limited" nuclear strikes; by further confusing Soviet predictions of the outcome of a strike; by driving Soviet missile deployments in directions favored by the United States; by lessening the consequences of nuclear attack; and/or by fulfilling still other strategic goals.

Critics dispute the validity of some of these goals; dispute that technology can fulfill the **truly useful goals; and/or argue that** the **many harmful side effects of introducing** BMD to the strategic equation and altering the Anti-Ballistic Missile (ABM) Treaty regime are not worth satisfying these goals.

To address the wisdom of less-than-perfect defense, the public and policy makers would need a precise statement of the strategic goal of the deployment, an assessment of whether technology could satisfy that goal, and an analysis balancing fulfillment of the goal against the side effects and uncertainties of introducing a new ingredient into the strategic nuclear arena.

3. **The strategic goal of President Reagan's Strategic Defense Initiative calling for emphasized BMD research—perfect, near-perfect, or less-than-perfect defense against ballistic missiles—remains unclear. No** explicit technical standards or criteria are therefore available against which to measure the technological prospects and progress of this initiative.

4. **In all cases, directed-energy weapons and other devices with the specifications needed for boost-phase intercept of ICBMs have not yet been built in the laboratory, much less in a form suitable for incorporation in a complete defense system.** These devices include chemical lasers, excimer and free electron lasers, x-ray lasers, particle beams, lightweight high-velocity kinetic energy weapons, and microwave generators, together with tracking, aiming, and pointing mechanisms, power sources, and other essential accompaniments.

It is unknown whether or when devices with the required specifications can be built,

s. **Moreover, making the technological devices perform to the needed specifications in a controlled situation is not the crux of the technical challenge facing designers of an effective ballistic missile defense. A distinct challenge is to fashion from these devices a reliable defensive architecture, taking into account vulnerability**

of the defense components, susceptibility to future Soviet countermeasures, and cost relative to those countermeasures.

New intercept mechanisms–directed energy weapons and the like—therefore do not by themselves necessarily herald dramatically new BMD capabilities.

6. **It is clear that potent directed-energy weapons will be developed for other military purposes, even if such weapons are never incorporated into effective BMDs.** Such weapons might have a **role** in nuclear offense as **well as defense,** in anti-satellite (ASAT) attack, in anti-aircraft attack, and in other applications of concern to nuclear policy and arms control. Defense and arms control policy will thus need to face the advent of these new weapons, irrespective of their BMD dimension.

7. For modest defensive goals requiring less-than-perfect performance, traditional reentry phase defenses and/or more advanced mid-course defenses might suffice. Such defenses present less technical risk than systems that incorporate a boost-phase layer, and they could probably be deployed more quickly.

New ideas for improving such "old" BMD concepts have emerged in the atmosphere of technical optimism enjoyed by the boost-phase concepts.

8. **Deployment of missile defenses based on new technologies is forbidden by the Anti-Ballistic Missile (ABM) Treaty reached at SALT 1.** The Treaty permits only restricted deployment of traditional BMDs using fixed, ground-based radars and interceptor missiles. Research into new technologies, and in selected cases development and testing of defense systems based on these technologies, are allowed within the Treaty.

9. **There is a close connection, not explored in detail in this Background Paper, between advanced BMD concepts and future anti-satellite (ASAT) systems.** This connection springs from four observations: 1) ASAT attack on space-based weapons and sensors is probably the most attractive countermeasure to boost-phase BMD; 2) directed-energy weapons are more likely to succeed in the easier mission of **ASAT than in the more difficult mission of boost-phase BMD; 3) to a degree dependent on technical details, early stages of development of boost phase BMDs might be conducted in the guise** of ASAT development, stimulating anxieties about the health of the ABM Treaty regime; 4) to a degree dependent on technical details, concluding a treaty with the Soviet Union limiting ASAT development would impede BMD research at an earlier stage than would occur under the terms of the ABM Treaty alone.