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SCIENTISTS UNCOVER SERIOUS ERRORS IN CONTROVERSIAL STUDY ON SDI

(Updating Executive Memorandum No. 158, "Why the Physicists' SDI Study Is Flawed," April 24, 1987.)

It has been a month since some members of the American Physical Society released their report casting doubt on the technical feasibility of the Strategic Defense Initiative (SDI). Since then, the evidence continues to grow that the scientific and technical quality of the APS report is seriously flawed. A number of prominent U.S. scientists, in fact, are beginning to ask why the authors rushed the report into print before they checked it thoroughly for errors.

Dr. Frederick Seitz, President Emeritus of Rockefeller University and a former President of both the American Physical Society and the National Academy of Sciences, observes: "I know of no precedent, in my 55-year association with the American Physical Society, for the issuance of so seriously flawed a document as this, under the aegis of that Council."

Errors by Factors Up to 100. Two other leading U.S. scientists with intimate scientific and technical knowledge of the SDI's directed energy programs also have raised serious objections to the APS study. Dr. Lowell Wood of the Lawrence Livermore National Laboratory and Dr. Gregory Canavan of the Los Alamos National Laboratory charge that "The APS report contains a number of major technical errors by factors ranging up to 100, [and that these] errors are always in the direction of making the task of defending the United States against Soviet missile attacks seem much harder than it really is...."

No Technical Evidence. Seitz's observations about the APS report are perhaps the most damaging because they cast doubt on the objectivity of the authors. In addition to charging that the APS study contains "numerous errors, inconsistencies, and unrealistic assumptions," Seitz took issue with an APS Council statement, issued subsequent to the release of the report, that condemned all prospects for near-term deployment of strategic defenses, in spite of the fact that the study did not deal at all with the most promising of all near-term defense technologies, kinetic energy weapons. Since the APS Council provided no technical evidence for this attack on the chances of near-term deployment, Seitz concludes that the APS Council's statement "abandons all pretense of being based on scientific factors, [and that] these actions by the Council of APS represent a political as well as a scientific declaration."

There is evidence as well that the APS study contains a number of serious scientific and technical errors. Wood and Canavan outlined a number of these in a statement before hearings conducted by the House Republican Research Committee on May 19. They were particularly perplexed that a number of conclusions in the report's Executive Summary were directly contradicted by the findings in the body of the report. Finally, they were concerned that the report did not receive the kind of peer review from fellow scientists that would normally be expected in a scientific study such as this.

Specific errors identified by Seitz, Wood, and Canavan include:

◆◆ Overestimating the amount of improvement needed in the performance levels of the chemical laser. The APS Executive Summary says that SDI research is at least a factor of 100 away from adequate performance levels in chemical lasers. Wood and Canavan say SDI-tested lasers are roughly a factor of only 10 away from meeting power level requirements for weapons performance against Soviet threats for the end of the century.

◆◆ Overestimating the amount of power needed for adequate performance of the excimer laser which someday could knock down missiles shortly after they are launched. The report says that one billion watts are needed. But according to Wood and Canavan, formulas in the report itself confirm that just six million watts are sufficient for an effective excimer laser defense against Soviet attacks.

◆◆ Overestimating the usefulness of a fast-burn booster (a hypothetical intercontinental ballistic missile (ICBM) that burns out faster and at lower altitudes than normal booster rockets) against directed energy defenses. The APS report states that a Soviet fast-burn booster can neutralize the effectiveness of a U.S. neutral particle beam defensive weapon. Wood and Canavan point out, however, that the technical analysis in the report itself clearly shows that this conclusion is incorrect. They say that, although a fast-burn booster can burn out at an altitude of 60 miles, which is ten miles lower than a space-based neutral particle beam can reach, a missile cannot release its warheads until it reaches 90 miles. Thus the missile with all its warheads on board can be attacked by the neutral particle beam even after the booster rocket has burned out.

◆◆ Overestimating the effectiveness of another theoretical Soviet countermeasure against U.S. directed energy defenses--spinning the missiles to distribute the heat of the laser beam, thus weakening the laser's effect. Wood and Canavan state that "the ICBM has to rotate at least once a second to spread the laser energy. The spin exerts centrifugal force on the walls of the missile which have to be strengthened at the cost of reduced payload and a complete missile redesign--for a very small gain."

Damning Indictment. The evidence mobilized by Seitz, Wood, and Canavan adds up to a damning indictment of the scientific and technical quality of the APS report. The numerous factual errors in the report are compounded by the subsequent statements by APS Council members on SDI matters that are not even addressed in the study. This raises serious questions about the manner in which this study was conducted. It seems that the study was rushed into print before it received adequate scientific review. Moreover, some of its authors have gone far beyond the realm of physics in making pronouncements and judgments on when they think SDI deployment can begin. With this evidence mounting, the credibility of the APS itself is at risk. The APS should recognize its mistake in issuing a seriously flawed report by withdrawing the report and undertaking a new study that will follow accepted procedures of scientific analysis and evaluation.

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