

in order to anticipate and explore possible countermeasures to strategic defence. The fast-burn booster, for example, would be a very effective foil for boost phase interceptors. Neutral particle beams would be rendered useless because, although they could burn through twenty centimetres of aluminum, they could not travel even a short distance through air. The earth's atmosphere would strip the electrons from the protons and the resultant charged particles would be deflected by the Earth's magnetic field. Fast-burn boosters would also pose problems for the X-ray laser, currently being promoted by Dr. Edward Teller. Dr. Teller favoured deploying X-ray lasers on submarine-launched missiles so that they could be moved up as close to Soviet missile sites as possible. The problem, said Dr. Garwin, was the curvature of the Earth. In order to attack Soviet missiles in their boost phase, the X-ray lasers would have to be launched very rapidly to clear the curvature of the Earth. This was the so-called "pop-up" mode. A rapid rise to a high altitude would require a large and powerful missile, costing much more than the Soviet missile it was intended to destroy. The shortened boost phase, attained with fast-burn boosters, would eliminate the possibility of using the X-ray laser for interception during this phase of trajectory.

There would be other consequences from Soviet deployment of fast-burn boosters. The number of space-based satellites might be increased by a factor of 30 because more warheads would survive the boost phase and would thus "overload" the mid-course layer of interception. Boosters were vulnerable to about ten calories per square centimetre, but re-entry vehicles would survive up to one thousand calories per square centimetre. Simply discussing strategic defence plans would ensure that the Soviet Union would develop and deploy fast-burn boosters. Thus, the United States was giving the Soviet Union a spur to build new, more survivable, more threatening missiles which would cost less than the kinds of missiles they were currently deploying.

Soviet mid-course countermeasures would also be cost-effective. As envisioned by SDI planners, kinetic energy weapons would fire "smart rocks" which must "hit-to-kill" Soviet warheads in space. The Soviet Union could simply deploy more warheads per missile, and smart rocks would have a hard time finding and tracking their targets against a background of nuclear explosions in space. In addition, each re-entry vehicle could be surrounded by metallic balloons attached to it by wires. "The smartest rock will choose at random and destroy one of the balloons and not the re-entry vehicle."