

Boost Phase Missile Defense: Present Challenges, Future Prospects

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Boost-Phase Missile Defense

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This panel addresses two fundamental questions: Does it matter whether we have a boost-phase defense and why don't we have one? I answer both questions as follows: For the first question, it matters very much whether we have a boost-phase missile defense and we could and should have such a defense for several important reasons that I will discuss in this presentation. For the second question, we do not have a boost-phase defense more for political reasons than for technical feasibility considerations. Both of these questions are extensively addressed in the 2009 Report of the Independent Working Group, entitled *Missile Defense, the Space Relationship, and the Twenty-First Century*, which can be downloaded from our IFPA website at:

<http://www.ifpa.org/pdf/IWG2009.pdf>.

- Let me first address the question of why it matters whether we have a boost-phase defense. There are several inherent advantages to boost-ascent-phase missile defense. Most important is the fact that our missile defense architecture should be designed to give multiple intercept opportunities once a missile is launched. We should be capable of intercepting and destroying ballistic missiles and warheads in each of the three phases of their flight – boost, midcourse, and terminal. If we have multiple intercept opportunities, the burden placed on any one of these opportunities is less than would be the case if we had only one intercept opportunity. We need to be able to intercept early and often. The layered concept for missile defense applies in other security arenas as well. For example, we should strive for layered defense if we are planning homeland security. Only one of our layers has to be successful to destroy a missile or to thwart a terrorist. To penetrate such defenses, the missile or the

terrorist would need to be successful in penetrating all of the layers. So you can see conceptually why logically layered defense offer maximum opportunities to deny missiles, warheads, or terrorists access to their targets. Layered defenses in the missile defense arena begin in boost phase.

- Boost-phase missile defense has another inherent advantage. The missile is relatively slow moving, not having yet achieved full acceleration. At this time it emits bright exhaust gases that are relatively easy for sensors to detect and track. Interception during the boost phase has the advantage of destroying the missile before it disperses its payload, which may consist of one or more warheads and possibly countermeasures such as decoys designed to confuse the interceptors. Intercepting a missile in boost phase has the additional advantage that the debris, including warheads, may, depending on how early interdiction occurs, fall on the country launching the missile. This is a situation that could have a substantial deterrent effect on the potential launcher of a missile if its leadership must face the likelihood of inflicting substantial damage on its own territory and people.
- Furthermore, let us assume for a moment that the missile has been hardened in order to reduce the possibility of destruction in the boost phase. The result is an increase in the missile's weight, possibly easing the task of later interception. The corresponding reduction of payload has the added benefit of diminishing the missile's range and/or its destructive potential.
- Finally, let us assume that one of the most devastating asymmetrical strategies that could be used against the United States would come in the form of a vertical launch missile carrying a warhead designed to detonate at an altitude of, say, between 40 and 400 kilometers above the earth's surface. As the 2004 EMP Commission Report points out an EMP attack would constitute a highly successful asymmetric strategy against a society as heavily dependent as the United States on electronics, energy, telecommunications networks, financial systems, transportation systems, the movement of inventories in its manufacturing sector, and food processing and distribution capabilities. The launching missile would obviously have to be intercepted in boost phase because that is the only phase that it would have. Similarly, if we

wanted to prevent an attack by a vertical launch missile such as what China used in its January 2007 ASAT tests, the intercept would need to come in boost phase.

- Therefore, there are several very important national security reasons why we need a boost-phase missile defense both as part of a multi-tiered or layered defense and for threats against which only a boost-phase intercept would be potentially effective.
- I turn now to the second question – why don't we have a boost-phase missile defense. Here I would argue that the answer lies more in the politics of missile defense than in any technical limitations. Politically, given the constraints once imposed by the now defunct ABM Treaty, the United States placed primary emphasis on ground-based treaty-compliant missile defenses. Such defenses are primarily designed for midcourse or terminal phase rather than boost-phase interception.
- Space-based defenses as well as sea-based defenses, and I would add the airborne laser, have boost-phase intercept capabilities. Yet space-based defenses have been politically the most controversial and therefore politically the least acceptable. As a result we have failed to deploy space-based interceptors that could destroy missiles and warheads in boost phase as well as midcourse and terminal phases. As we point out in the IWG Report, the United States had developed a missile defense that could have begun operating as early as the mid 1990s that included space-based interceptors known as *Brilliant Pebbles* providing for a layered defense against missiles launched from any point against the United States itself or its interests overseas. By the early 1990s, as a result of the technology investments during the preceding decade, the space-based elements were more technically mature and capable of rapid development than the ground-based missile components of the missile defense system then envisioned. The space-based missile defense based on kinetic energy interceptors would have placed heavy emphasis on boost-phase interception. It was a program that had survived numerous peer reviews, had been approved by the Pentagon's acquisition authorities, and yet was curtailed by Congress in 1991 and 1992 and then canceled by the Clinton Administration. Despite this cancellation, advances in the commercial, civil, and other defense sectors since that time would now permit even lighter mass, lower cost, and higher

performance than would have been possible with the 1990-era technology base. Advances in technology would make possible boost-phase intercept of even short- and medium-range ballistic missiles as well as ICBMs.

- However, again to turn to the question posed at the beginning – why do we not now have a boost-phase defense, I believe that the answer lies in the belief that somehow the United States can keep space free from military activities. This gives rise to policy and programmatic recommendations that lack logical foundation and are contrary to U.S. interests. This includes the contention that the weaponization of space is, or should be, prohibited or drastically limited by international treaties. However, such treaties would be neither enforceable nor verifiable. Defining what is a space weapon is problematic. For instance, it is possible, as China demonstrated in January 2007, to launch a missile from earth designed to shoot down a satellite in space. Yet such a missile could also be used for other purposes. The problem of defining what is a space weapon is further complicated by the fact that in space any object with maneuvering capability is potentially a “weapon” because it could be directed to collide with another object, subject only to the limits of fuel and physics. As a result, the United States has long held the view that these problems render space arms control impractical, unnecessary, and counterproductive. Nevertheless, we have failed to exploit the opportunities afforded by space-based interceptors for a truly global layered missile defense that includes the boost phase. Since the reasons have little to do with technology, one can only conclude that such defenses do not exist because of conscious political choices or the unwillingness of recent administrations to expend political capital on space-based missile defense. The failure to do so has serious implications and consequences for achieving boost-phase defenses.
- On a concluding note, it is useful to point out that sea-based defenses can potentially intercept a missile in its boost phase, provided the sea-based platforms are located in the necessary proximity to the launch point. Ground-based interceptors deployed on the territory of allies could also provide a degree of boost-phase intercept capability against ICBMs launched from some locations, but gaining such access and deployment rights would be more difficult than stationing ships in international waters or deploying space-based interceptors.

- Finally, the United States has been developing the airborne laser, to be deployed on board a Boeing 747. The ABL could detect, track, and intercept an attacking missile within its range while still in boost phase. Nevertheless, there are logistical and operational problems and enemy counter measures that diminish the utility of the ABL. Operations during a crisis or war would depend on the ability to provide relative safety to the aircraft via protective escort aircraft. The ABL would be vulnerable because an enemy would probably take action to prevent its missiles from becoming vulnerable to boost-phase intercept.

In conclusion, there are several reasons, as I have indicated, only the United States has little or nothing in the way of boost-phase ballistic missile defense. However, there are also several reasons why we need such defenses, as I have also tried to point out. Whether and when we get the boost-phase defenses that we will increasingly need will depend on the future, as it has in the past, on the willingness of political leaders to place greater emphasis on boost-phase missile defense. In the present political environment, sea-based missile defense offers the greatest opportunity and there is broadening bipartisan support for such defense. On space, however, we remain far from political agreement, even though for reasons that I have indicated, space-based missile defenses would give us the best basis for a truly global missile defense that is layered and which includes the boost phase.