

Ballistic Missile Defense in Context

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Comments on BMD

Government programs, especially military programs, should be beneficial. This means, for the most part, that they must pass the test of open analysis and not just plausibility.

A program that is not effective is like a fraudulent cure for disease—it wastes money, but it also prevents the ill from receiving effective treatment.

This country has a long history of programs attempting to defend against ballistic missiles. Some have made sense (even though they were not pursued); others have been flawed from the onset.

Defending against nuclear weapons and the only other weapon of mass destruction—biological weapons—is extremely desirable, but “If wishes were horses beggars would ride.”

The Missile Defense Agency—MDA—has responsibilities and capabilities in addition to its most costly and most publicized one of mid-course intercept of ICBMs from states such as Iran or North Korea. Some of these programs are quite effective, such as the recent demonstration that MDA can destroy low-orbit satellites—which is, however, like shooting ducks in a pond. But the primary responsibility—that of protecting the United States against attack by nuclear weapons or biological weapons is a failure and will remain so for the foreseeable future, so long as MDA attempts to carry it out by mid-course intercept. There are three reasons:

1. A state wishing to deliver nuclear weapons to injure the United States homeland would far more likely use short-range ballistic missiles or cruise missiles launched from a ship to attack U.S. coastal cities with nuclear weapons than use an ICBM for that purpose.
2. If a state did desire to use ICBMs, its delivery of bio-weapons would be more effective and impossible to counter by any proposed missile defense, if it used dozens of “bomblets” each equipped with its own heat shield. Separating as soon as the missile achieved its final speed and course in the vacuum of space, these scores or

hundreds of bomblets could not be intercepted individually or collectively by the non-nuclear systems being deployed, and would fall to their targets in an urban area, posing a greater threat of death or disease than would a single warhead containing the germs to be delivered.

3. Should a state be so misguided as to attempt to deliver nuclear weapons by ICBM, they could be guaranteed against intercept in midcourse by the use of appropriate countermeasures. A 1999 NIE judges specifically that Iran or North Korea could have such effective countermeasures by the time of their first ICBM test.

Now a small expansion on each of these points, and then I would welcome questions for discussion.

1. Use of nuclear-armed short-range ship-fired missiles

Iran has available Chinese-made HY-2 and C-802 cruise missiles as well as SCUD-B ballistic missiles with a range of 300 km and 1-ton payload that could be fired from ships. The U.S. now has no defense of coastal cities against the launch from a ship of such a missile carrying nuclear or biological warhead. The 1998 Commission to Assess the Ballistic Missile Threat to the United States stated clearly the threat from ship-launched ballistic or cruise missiles, validated in 2006 by MDA's chief of analysis and scenarios as a way to achieve "great strength at low cost" in analogy to the IEDs that are such a threat in Iraq—but in this case to deliver city-destroying nuclear weapons.¹

¹ Ben Stubenberg, <http://www.defensenews.com/promos/conferences/cmd/1739588.html>

2.ICBM with dozens or hundreds of bomblet/RVs

ICBM delivery of a warhead containing 500 kg of anthrax or smallpox must provide a shield against the heat of reentry and then a means of aerosolizing the bio agent so that it will remain suspended as it wafts across the city. It would be militarily more effective and incidentally proof against intercept by the midcourse interceptors to divide the payload into a many few-kg bomblets, each with its own heat shield/RV—the bomblets of the design from the US BW program in the 1960s, now declassified. Effective heat shields for reentry are available from NASA data as described in a 2000 report² and illustrated here.

² “Countermeasures...” <http://www.ucsusa.org/assets/documents/jump.jsp?origID=pdf-348> (Page 54)

2. ICBM with dozens or hundreds of bomblet/RVs (more)

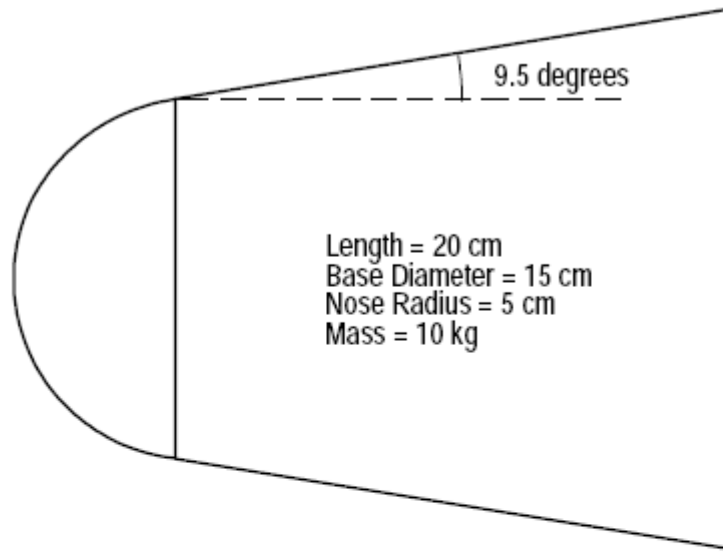


Figure 7-1. The configuration used for calculating the heating of a conical bomblet. It has a nose radius of 5 cm, a base diameter of 15 cm, a length of 20 cm, a cone half-angle of 9.5 degrees, a mass of 10 kg, and a ballistic coefficient of 12,000 N/m² (250 lb/ft²).

occupy only a third of this volume, leaving plenty of room for the dispensing mechanism.¹⁸

Details of Dispensing Bomblets. It is useful to compare the trajectories of the bomblets with the trajectory that a unitary warhead would follow if launched by the

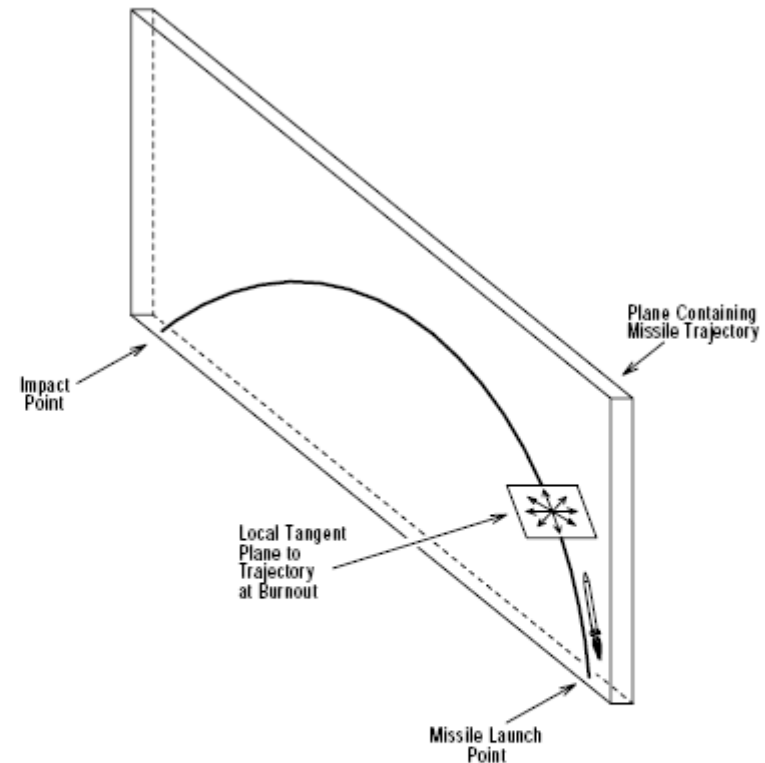


Figure 7-2. The trajectory a bomblet would have if it was given no additional δv after burnout of the missile. The tangent plane to the trajectory at burnout is also shown. Giving the bomblets small velocity changes δv by adding velocity vectors lying in this plane will spread the impact points of the bomblets around the $\delta v=0$ impact point.

3. Countermeasures to intercept of a nuclear warhead

Others on this panel will discuss decoys and countermeasures in detail, and I am prepared to answer questions. Here I just note that MDA claims now to be able to handle decoys on a few ICBMs launched from Iran or North Korea but its director in a 2007 article³ writes *“And the Multiple Kill Vehicle system is a generational upgrade to the land- and sea-based midcourse interceptors that will allow us to handle decoys and countermeasures.”* But how does the system available in 2015 allow us to “handle decoys and countermeasures” now? A classified technical session devoted to the decoy problem and solutions could bring some assessment of the realistic performance of the system.

³ “Missile Defense Hits Mark” <http://www.defensenews.com/story.php?i=3244574&c=FEA&s=COM>

Questions for the Missile Defense Agency

a. In the past, defense against ICBM delivery of bio weapons against U.S. cities was one of the goals promised by national missile defense. Does MDA now believe that the mid-course defense now deployed has the ability to defend against ICBMs equipped with scores of bomblet/RVs that separate just after boost phase? Does MDA believe that threat is not realistic?

b. In view of the 1999 NIE's judgment that Iran or North Korea would have decoys for their ICBMs by the time of the first flight test, can MDA point to a sound,

technical (classified) analysis that analyzes the performance of the present MDA-deployed system against the suite of decoys stated as credible in the NIE—separating RVs, spin-stabilized RVs, RV reorientation, radar absorbing material (RAM), booster fragmentation, low-power jammers, chaff, and simple (balloon) decoys?

c. In a June 28, 2007 presentation to a European Union body, MDA’s executive director assumes “Interceptor launched 250-300 sec after threat.” In one of my papers⁴ I note that interceptor launch 50-100 sec

⁴ “Ballistic Missile Deployment to Poland.” <http://www.fas.org/rlg/081507BMDPe.pdf>

after threat was assumed by a very competent study. MDA's assurance that the interceptors in Poland would not be able to destroy even one Russian ICBM launched against the United States (and that of President Bush and Secretary Gates) depends on this assumption of 250-300 sec delay in launch. MDA should be requested to explain why an interceptor can't be launched less than 100 sec after the threat.