Missile defence in South Asia

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With its first successful Ballistic Missile Defence (BMD) test on November 27, 2006, India joined the BMD club that includes countries like the U.S., Russia, China, Japan and Israel.[1] The timely interception of one *Prithvi* surface-to-surface ballistic missile by another modified *Prithvi* could not be devoid of various implications, perceived diversely across the region. Before coming to the real implications, it is pertinent to give an account of the BMD technology, its functioning, development and shortcomings in the present day.

Ballistic Missile Defence (BMD) is a system that brings into use a coordinated functioning of various devices and equipment in order to counter a ballistic missile threat. The main purpose is to identify, track down and hit an aggressive incoming ballistic missile. To serve that purpose, a system of sensors, sea/land-based radars, satellites, interceptors, multiple-kill vehicles and other necessary management and communication channels are put in place. The system is rendered successful if the aggressive missile is shot down before it hits the target. That can either be accomplished at any of the three flight stages, i.e., the boost phase, ballistic (mid-course) phase or the descent (terminal) phase.

For those unacquainted with the working of a ballistic missile, the boost phase is the portion of a missile's flight following the launch, in which it is thrusting to gain the acceleration needed to reach its target.[2] While the missile climbs against the earth's gravity, it intends either to enter space (in case of medium-long range ballistic missiles) or just touch upon the fringes of outer space (short range). With the completion of firing its propulsion system, a missile enters the longest portion of its flight, the mid-course phase. That is when a missile is coasting or free falling toward a target, whether through entry into space or in its confines.[3] The ballistic missile's re-entry into the atmosphere till the time it hits the target is known as the terminal phase.

It is generally believed that it is more convenient to shoot down a missile while the boosters are still burning before it releases its munitions or decoys. That is known as boost-phase interception. However, such interception is not void of shortcomings, for all depends on timely detection and response. In firing the interceptor, which is a two or three-stage

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booster rocket whose payload is a rocket propelled vehicle;[4] there is a need for it to follow the right trajectory, so as to keep a track on the missile. For a missile to be detected, a State may use specific radars or sensors.

The technology in use of America's Defense Space Program (DSP) is that of infrared sensors on satellites in geosynchronous orbits.[5] This system is equipped with a telescope that continually scans the whole disc of the earth. However, that is inadequate for a boost defence, since it gets to see a rocket only when it has reached an altitude of 10 km.[6] There is news of DSP satellites being replaced by satellites of new Space-Based Infrared System High (SBIRS-High) in a couple of years. These satellites would bring into use space-based infrared sensors, but even the best of those cannot detect a missile unless it has reached an altitude of at least seven km. The detection would be through the identification of a bright spot with very high velocity so as to confirm the presence of a missile and nothing like an aircraft. Processing this data in order to operationalize the system for interception is sure to take at least between 45 and 60 seconds, depending on the type of missile.[7]

Mid-course interception is much talked about these days. Mid-course system is a defence system that is designed to destroy warheads at high altitudes, i.e., hundreds of miles of altitude, in an environment of near vacuum. By simple rules of gravity and physics; in vacuum, the motion of all objects remains unmodified by aerodynamic drag. As a feather and a rock would travel with the same speed, so would a heavy warhead and a decoy, which puts a question mark on the feasibility of the mid-course system. Even in the atmosphere outside of space, identifying the warhead among bait of decoys is a hard task, which is yet to be countered.

Then there is also the problem of tumbling warheads which are not static but spinning in motion. The problem of tumbling warheads is not that these are harder to hit but when combined with tumbling decoys, they create a problem of picking the actual warhead from the decoy. The only shortcoming that is attached to tumbling warheads and decoys is that of spin stabilization, but methods are evolving through which that can be attained. The use of kill-vehicle equipped with a system of sensors, seems the most viable option in mid-course defence. However, it can also be overwhelmed with decoys, since it is too expensive to go after both the warheads and decoys. The terminal phase interception, as a last resort, would be equally difficult, since the missile is at the peak of its speed and is only seconds away from the target.

Let us now assess the viability of the Indian BMD and its implications for the South Asian milieu. India has made serious efforts to get access to

the BMD technology since America's unilateral abrogation of the ABM treaty in 2001. Its claimed reasons for the necessity of BMD system are related to the threat of a possible missile attack from its neighbours, China and Pakistan. Furthermore, it claims to be vulnerable to an accidental or unauthorized launch of a missile attack from terrorists, which is very unlikely but at least provides India the pretext to pursue its various ambitions, the procurement of BMD being one of them.

India's first priority was to get the Israeli *Arrow* or Russian *S-300* systems, which are already functional. However, Indo-Israel Arrow deal could not get through, as it failed to get an approval from the U.S. that considered it to be a violation of the Missile Technology Control Regime (MTCR).[8] However, it is important to note that, in its first successful test, India used Israeli-imported *Green Pine* radar for the purpose of detection. As for the Russian S-300, an article on *domain-b.com* reports that "informed speculations over the years would suggest that India may already have deployed a few batteries of the Russian S-300 system as an interim arrangement."[9]

As India claims to have crossed the BMD threshold, what should Pakistan do? A rash move would be to attempt one such system of its own, in order to balance out the equation. But how sensible would that be for a country that is struggling with its economy due to the already soaring defence expenditures?

A more blasé approach would be to play the waiting game. It is no hidden truth that during Gulf War-I, the U.S. *Patriot* system remained largely ineffective, as it could target only a few of the much inferior Iraqi ballistic missiles. The failure of *Patriot* was a severe blow to the security the Americans presumed it would provide, as it remained impotent in delivering the results of peacetime testing.

War games and military exercises come out as wonders during times of peace, when the aggressor is not a real enemy but one formed out of pretence. However, in real time confrontations, the enemy may not play by your rules; therefore, you cannot guarantee your success, even if you infer to have an absolutely flawless defence that every State dreams of.

Pakistan's missile arsenal does not depend fully on ballistic missiles, and can, therefore, make effective use of cruise missiles. The various types of cruise missiles currently in possession of the Pakistan Military are the air-launched "Ra'ad" ALCM (Hatf VIII) and the ground-launched "Babur" (Hatf VII). These missiles can accurately deliver both conventional and nuclear warheads. Since cruise missiles are unmanned, they require

no flight crew training or expensive upkeep programmes. A major advantage of a cruise missile is that, during flight, it follows a low trajectory and, hence, eludes the radar. This invisibility has to do with the curvature of the earth, the surface of the earth and the fact that microwaves travel through space in straight lines.[10] When the missile stays close to the ground, the microwaves of the radar cannot reach it, as the waves bounce off mountains and other obstacles.[11]

As the BMD today is an unreliable system, one would wonder what possible implications it may have on the region, and even if these implications are valid, what their degree of severity can be. Where the case is not such that one test pertains to an anti-missile shield around the Indian territory, hence, making it impenetrable; nonetheless, the probability of a false sense of security stays. The possession of the BMD may, however, stimulate a demonstration of brinkmanship perceived by the Indians as an opportunity to conduct the much desired "surgical strikes" against Pakistan, with the confidence of retaliation blockade through missile interception. The post-9/11 period has witnessed Indian receptiveness to doctrines of "pre-emption", "limited war" and "cold start". Therefore, BMD makes the peril of defensive-offence a reality in the region.

The underlying Indian agenda may even be the instigation of an arms race in the region, which would prove to be unrewarding. Pakistan must learn from the Soviet mistakes of the Cold-War era, where the quest for attaining parity with the U.S. proved to be so counter-productive that it led to the demise of the mighty Soviet empire that extended from Eastern Europe to the other end of Asia. What the Soviets probably did not focus on was the significance of "sufficiency", i.e., the number of weapons and warheads adequate to ensure retaliation or in other words assurance of "credible minimum deterrence".

In today's world, "credible minimum deterrence" is no more a quantified term wherein a State like Pakistan with such an ambiguous doctrine would have a fixed number of weapons, warheads or missiles to retaliate effectively. On the other hand, it would be wiser to actually think in terms of the damage inflicted upon the enemy, i.e., the number of major cities hostage to the warheads and missiles. So, can the BMD system stop Pakistan from doing so? A straight answer would be No! The efficacy of BMD as provided by the tests is limited, even for the best systems like *Patriot* and *Arrow*, and then there are a number of above-listed ways to counter BMD. Moreover, China's FT 2000, Hongqi-2 (HQ-2), HQ-9, 10 and 15 are operational; so chances for Pakistan to access these systems are likely.

The future of BMD is uncertain; so, logically, why would a State want to be equipped with a system of dubious capability worth billions of dollars? A better option would be to divert this money to the much-deprived social sector with a huge population, for it is unfair to give the masses a sense of security from missiles and warheads whereas their primary threats are hunger and disease. India's self-given status of "great player" in the region demands rational behaviour; therefore, it must bring into consideration the spill-over effects of the BMD in the region.

Howsoever much the neighbouring States of Pakistan and China may avoid, the possibility of a regional arms race in the near future cannot be ruled out. It's time India showed responsibility towards a better future for the region, which cannot be expected through the pursuit of jingoistic aspirations due to which the efforts at peace often get to a dead-end. The region needs an era of genuine stability; means other than military must be given a chance.

Notes & References

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