BALLISTIC MISSILE DEFENCE: STRATEGIC ISSUES AND DILEMMAS

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If you have a shield, it is easier to use the sword.
—Richard M. Nixon

In the history of warfare, two major trends can be traced – one is the increasing lethality of weapons and the second is their increasing range. The limit of lethality has been reached with the evolution of nuclear weapons and the limits of range have been reached with the evolution and employment of intercontinental ballistic missiles (ICBMs). Within a decade from its first use during World War II in 1944, the ballistic missile emerged as the most high profile weapon delivery system and became central to strategic stability between the superpowers.

The opulent arms race of nuclear tipped ballistic missiles between the US and USSR manifested in the Cuban missile crisis in 1962. The reality of mutual vulnerability (Mutual Assured Destruction – MAD) was recognised and accepted as the *modus vivendi* for stability in the bipolar world. The period of *détente* between the US and Soviet Union was one of uneasy stability wherein both sides were engaged in developing defensive systems

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against ballistic missiles to gain military advantage and upset the strategic balance in their favour.

Counter-force, by its capability of knocking out almost all the missiles of the adversary before they were even launched, was in effect the prime ballistic missile defence during the Cold War. The counter-force attack envisaged 'first strike' capability. Since the hundred percent destruction of the missile arsenal of the adversary was not achievable, a defensive shield known was sought which could reliably 'mop up' all of the few approaching missiles, those could survive the counter-force 'first strike'. Thus, an 'anti ballistic missile system' (ABM system) was recognised as essential to a credible first strike capability.

Against the backdrop of the nuclear arms race and shifting of the strategic balance from that of a bipolar to a unipolar and then to the multipolar world, the development of defensive systems in the last six decades remain a vexation. The exhorbitant cost of development and the complex technology, which is yet to provide an efficient, full-proof system, is one factor, the other being that, despite being a defensive system, it is profoundly destabilising and strategically aggressive. On the one hand, missile defence signals a choice to resolve a defence dilemma through defensive means, and, on the other, an active defensive system upsets the security balance by providing the capability to attack first and defend against retaliatory strikes. The excitement and hullabaloo about the ballistic missile defence and its effects on arms control, strategic stability worldwide and in the context of regional security dynamics cannot be appraised unless it encompasses the history of missile defence .

The history of missile defence is long and convoluted. Though ABM systems began to surface since the 1950s, systematic development through projects and testing started during the 1960s, when parity of nuclear weapons was the criterion of stability and strategic balance between the superpowers. The arms race further fuelled the urgency to achieve the credible first strike capability through the development of MIRV (multiple independently targetable reentry vehicle), accuracy of warheads through MARV (manoeuvrable advance reentry vehicle) and effective ABM systems to thwart retaliatory strikes. The technological difficulties were enormous and the cost of overcoming them prohibitive.

Notwithstanding, the US missile defence programme continued through the development of the Nike-Zeus/Nike-X/Sentinel and Safeguard system[1]. The Soviets were also pursuing an active defence programme. In 1966, the USSR deployed an ABM system around Moscow consisting of 64 reloadable launchers at four complexes known as the 'Galosh' system[2]. A growing discontent with the concept of mutually assured destruction as a deterrent led to new emphasis on defensive technologies in both the US and the Soviet Union.

The perplexity in the context of deployment of ballistic missile and missile defence systems kicked up a controversy. These active defences sparked intense debate on the viability of ABM systems as the cost of their development as well as of operation was enormous and the effectiveness of the systems was doubtful. Despite phenomenal progress in technology, till date, the viability and effectiveness of ABM systems are the prime issues in the strategic security planning of any country. Will ballistic missile defence (BMD) work? What is the promise of future technology? Will BMD provide the defence an upper hand? Is less than 100 percent defence acceptable? The change in the post Cold War strategic equations has complicated the issue. Space weaponisation is an issue which has further complicated the arms control efforts and strategic balance.

SCOPE

The scope of this paper is to study the strategic issues in the BMD perspective since the Cold War and configuration of the ABM Treaty to resolve the bipolar strategic balance. The rhetoric of "Star Wars" and US initiatives to develop and deploy missile defence systems have been studied. How

1. Safeguard was the first operational US anti-ballistic missile system. A two-tiered system, it consisted of long-range Spartan and short-range Sprint missiles, all nuclear-armed, designed to protect the ICMB silos in North Dakota. Shortly after its 1975 deployment, however, the US Congress cancelled Safeguard due to concerns over its capability and effectiveness.< www.missilethreat.com/missiledefensesystems/id.55/system_detail.asp>
   The A-35 or ABM-1 anti-ballistic missile system was a Soviet military battle management radar complex deployed around Moscow. It featured the nuclear-tipped exo-atmospheric interceptor ABM-1 Galosh. <www.answers.com/topic/a-35-anti-ballistic-missile-system>

2. Sanford Lakoff, *Strategic Defense in the Nuclear Age* (Westport: Praeger Security International, 2007), pp.22-26.

Growing discontent with the concept of MAD led the US to make a determined push to upset the strategic balance in its favour by building an unanswerable first strike nuclear attack capability against the USSR.

did anti-ballistic missile systems become the touchstone for competing strategic, political, technical and moral ideas about the role of nuclear weapons, deterrence and stability? The rationale of the US policy of the "Strategic Defence Initiative" (SDI) leading to the "National Missile Defence" (NMD) which sought the abrogation of the ABM Treaty as a Cold War relic which no longer corroborates strategic stability has been analysed. The worldwide response to the NMD and its implications in the overall strategic context have been addressed.

ABM SYSTEMS AND STRATEGIC ISSUES DURING THE COLD WAR

The US and USSR were testing elements of the ABM system based on long range interceptor missiles armed with nuclear warheads and directed by an elaborate radar network. Soviet systems were validated as successful but the Soviet programme mostly remained shrouded in secrecy and inaccessible.

Growing discontent with the concept of MAD led the US to make a determined push to upset the strategic balance in its favour by building an unanswerable first strike nuclear attack capability against the USSR. This has been the US policy till date. The fact was also appreciated that the first strike will never achieve 100 percent destruction of the Soviet nuclear weapons and ballistic missiles. Therefore, a defensive shield to protect the US from those few Soviet missiles that would have survived the first strike was thought of as an essential requirement, as a component of US first strike capability. It was argued that such a defensive shield will make the threat of first strike credible, because a ballistic missile defensive system will evidently be more effective against a weakened counter-attack than against a first strike. The ABM system, therefore, provided a rationale to attack first, thus, complicating the stability paradigm by adding to the uncertainties of a first strike.[3]

3. Lakoff, Ibid.

The efforts of fielding an ABM system during the 1960s could not progress due to the following reasons:

- Reliance on nuclear warheads for ballistic missiles interception. The electromagnetic pulse (EMP) caused by explosions of interceptor warheads would be detrimental to the defender's own ABM radar network, satellites, and interfere with national communication and electronic systems.[4] Exploding own nuclear warheads over one's own territory could make the solution as bad as the problem it addressed.
- The radar systems are required to be powerful, sophisticated and network enabled for real-time data communication between sensors and shooters through an effective command and control structure. This was a difficult proposition with the technology of the 1960s[5].
- Relatively simple counter-measures could render the ABM system ineffective.
- The ABM system was not capable of defending against saturation strikes comprising a large number of missiles. The task of hitting an incoming warhead was complicated because of the possible use of MIRVs in which an ICBM carries several RVs that can hit widely spread targets, confounding and possibly saturating the defence.
- Deployment of a widespread ABM system would have put the adversary into a *de facto* posture of massive retaliation. It offered a rationale to adopt the 'strike first' policy, as defending from counter-strike is a relatively easier proposition. The ABM system, thus, introduced ambiguity in strategic calculations.
- ABM systems were exorbitantly costly to develop and operate, given the advantage they offered with the then existing technologies.

4. "Nuclear Weapon EMP Effects" < www.fas.org/nuke/intro/nuke/emp.htm.>
5. The radars required for the anti-ballistic missile systems were 100 times larger than existing surface-to-air missile radars, and generated 10 million times more energy. They required encrypted communications lines between the radar and the guidance system computers. The computers themselves had to be capable of 40,000 operations per second. <http://www.astronautix.com/lvs/v1000.htm>

ABM TREATY

By the late Sixties, the technological challenges, operational difficulties and exorbitant cost of ABM defence systems had led to a bitter debate that continues to this day. Advocates of ABM defence admitted that it was not technically possible to build a leak-proof defence against the strikes of hundreds of ICBMs, but maintained that even a partial defence could save tens of millions of lives and would complicate the plans of any adversary scheming to perform a nuclear 'first strike'.

Conversely, critics argued that given the technical challenges, massive expense and effectiveness of simple counter-measures, it was not a viable system. They also felt that the ABM system might actually disrupt the balance of power.

By the early Seventies, during the period of *détente*, both the superpowers focussed attention on arms control treaties as a means of scaling back the arms race and preserving the basis of nuclear deterrence. The two superpowers basically agreed that the technology of the time was inadequate to create an operable ABM system and also the limitation of ABM systems was essential for agreements on reduction on strategic nuclear weapon levels.[6] MAD had become the focal point of efforts for strategic stability which drove the US and USSR to the Strategic Arms Limitation Treaty (SALT) to establish limits on strategic offensive weapons such as ICBMs and to impose restrictions on the development of ballistic missile defence systems through ABM Treaty[7] signed in 1972. The United States and the Soviet Union negotiated the ABM Treaty as part of an effort to control their offensive arms race.

The two sides reasoned that limiting defensive systems would reduce the need to build more or new offensive weapons to overcome any defence that the other might deploy. Without effective nationwide defences, each superpower

6. Bhupendra Jasani, *Space Weapons and International Security* (SIPRI, Oxford University Press, 1987), pp.3-6.

7. "The Anti-Ballistic Missile (ABM) Treaty at a Glance" < www.armscontrol.org/factsheets/abmtreaty.asp > "The ABM Treaty and Ballistic Missile Defense" < www.fas.org/spp/eprint/cfr_nc_4.htm>

remained vulnerable, even with reduced offensive force holdings of nuclear weapons, deterring either side from launching an attack first because it faced a potential retaliatory strike that would assure its own destruction. The ABM Treaty was hailed as a cornerstone effort towards bipolar stability and worked as an enabler to the policy of MAD.

Neither side was allowed to develop a nationwide missile defence system, although they were permitted to develop two ABM areas: one around the capital city and another around an ICBM launch site. This was later reduced to one deployment site with an upper ceiling of 100 launchers and 100 anti-ballistic missiles.[8] However, research and development (R&D) of the ABM system continued in a quiet fashion at lower budget levels through the late 1970s. The focus of defence development programmes was on 'hit to kill' (HTK) technology because, by then, it became feasible to accurately guide the interceptor missile to the incoming RV and ram it, without even carrying a nuclear or conventional warhead.

Strategic Defence Initiative

By 1982, the political climate began to shift away from the comfortable notion that nations were better off keeping themselves exposed and defenceless while relying on offensive weapons to balance the deterrence. With the Soviet invasion of Afghanistan in December 1979, the superpower relations began to deteriorate once again. The high hopes of arms control were at best a mixed bag and attention turned towards the strategic balance of power. Soviet arms control violations were also brought to notice which were significant and elicited the US decision for missile defence.

President Reagan refused to accept the notion that vulnerability to attack represented a superior moral and strategic position. He raised serious questions about stability through MAD and was against the arrangement of stability by holding US populations and cities hostage to an ever growing number of Soviet missiles. The Soviet Union carried through its substantial improvement programme in 1980 for its Moscow

8. http://www.state.gov/www/global/arms/treaties/abm/abm2.html

BMD system to overcome vulnerabilities and increase its capabilities to respond, alarmed the US. This expanded Moscow system involved two layers instead of one layer of defence and radars which were deployed on the borders of the USSR. The new system known as ABM-X-3 had an advanced phased array engagement radar and a high acceleration interceptor missile.[9] The technological improvements in the Soviet Union contributed to the US motivation to introduce the SDI.

In March 1983, Ronald Reagan announced his decision to launch a major new R&D programme to see if it might be feasible to deploy effective missile defences at some point in the future. This marked the point of departure for the basis of the US strategic policy away from the threat of retaliation and toward protecting the American people and territory against attack. Based upon the technical recommendations, President Reagan established the Strategic Defence Initiative Organisation (SDIO). With the SDI, defence against ballistic missiles changed from a marginal role since the conclusion of the ABM Treaty to a major national goal. As a focussed research and technology development programme of the highest priority, SDIO was given the mission to pursue various technological paths leading to a viable, comprehensive BMD system. The promising technologies were high power conventional lasers, particle beam weapons, orbiting X-ray lasers and orbiting constellation of small satellites carrying HTK interceptors[10], known as "Brilliant Pebbles"[11]. This again sparked an intense debate and denunciation by idealistic arms control and peace groups, political, regional and scientific communities. Nonetheless, the missile defence became a visible issue, out of the closet.

9. Mira Duric, *The Strategic Defence Initiative* (Ashgate Publishing Ltd., 2003), pp8-15.

10. HTK interceptors: Systems that rely on collision with the incoming weapon are called "hit to kill". These systems use the motion and mass of a kill vehicle to strike an incoming weapon. The hit-to-kill or kinetic energy technology approach is based on the fact that when one object strikes another object at high speeds, a tremendous amount of destructive energy is released. The impact of an interceptor missile with an incoming tactical ballistic missile, aircraft, or cruise missile, can result in the total disintegration of both vehicles. Such impact can literally vaporise even metals.

11. Brilliant Pebbles, the top anti-missile programme of the Reagan Administration, was an attempt to deploy a 4,000-satellite constellation in low-earth orbit that would fire high-velocity, watermelon-sized projectiles at long-range ballistic missiles launched from anywhere in the world.

Reagan's aversion to nuclear weapons, even if they were to be used defensively, was one of the reasons behind the establishment of SDI. Reagan counted on American technical superiority in the elements needed for development of the missile defence system. He believed that the Soviets would opt for a negotiated reduction of nuclear weapons and that would not only lessen the danger of nuclear war but also set back the global expansion of Communism.[12] In 1985, SDIO released the architecture of a defensive system describing a possible configuration.

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This architecture suggested defensive layers, including air, land, sea and space-based components to track and shoot down incoming missiles during the boost, cruise and descent phases of a ballistic missile's flight. Hundreds of satellites were proposed for command and control, communication, remote sensing, battle management and interception. However, simple counter-measures could negate these defences. This weakness evoked serious debate against ABM efforts because, if even one percent of nuclear warheads escaped the defence shield, the outcome would be devastating. The technical side of the SDI debate, thus, proved weak because providing better than 99 percent defensive coverage was not achievable.

SDI became a subject of controversy among political leaders and allies. Whether a defensive system based on the use of space weapons will technically achieve defence for the whole population was debated and also it was argued that such a system will, no doubt, destabilise international relations. Contrary to the US argument that nuclear weapon will become obsolete when such a defensive shield is available, it was contended that there may be an increase in offensive weapons in order to saturate the defences of the opponent, at least during the phase when only one side has acquired the capability to defend against ICBMs. Concerns over the 1972 Anti-Ballistic Missile Treaty, the possible destabilisation effects of SDI, and its enormous cost became major issues.

12. Lakoff, n. 2, p.35.

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The Soviet Union saw SDI as an American effort to militarise space and persistently refused to accept it as a defensive system. The USSR observed it as a system which would improve surveillance communication through space, which would improve the targeting of offensive weapons. They observed that SDI would provide anti-satellite weapons (ASATs) and even allow for placing of weapons in orbits. All the arms reduction talks between Gorbachev and Reagan remained in an impasse, with SDI as the stumbling block, which Reagan was not willing to bargain. However, the Soviets agreed to break the linkage between arms reduction agreements and SDI and the way was cleared for the Intermediate Nuclear Forces (INF) Treaty which was signed in 1987.

The North Atlantic Treaty Organisation's(NATO's) discomfort with SDI was that NATO's security planning had been premised on the belief that nuclear weapons were the single most important element in the strategy of deterrence and defence spending was designed accordingly. Reagan's call for a "defence transition" which would presumably make the nuclear weapons impotent and obsolete was seen as a complete reversal of the strategic consensus adopted by NATO. This call could make their military hardware, acquired at great expense, obsolete and their efforts towards a policy of "flexible response"[13] go to waste. Their biggest fear was that it would decouple

13. Flexible Response: When President Kennedy took office in 1961, he modified Eisenhower's policy of Massive Retaliation and adopted a stance of Flexible Response. This policy included the use of conventional forces in war and offered alternatives to total nuclear war. The alternatives consisted of an increase in conventional weapons systems and introduced the concept of limited nuclear war. Both President Kennedy and his successor, Lyndon Johnson, determined that effective military power meant stronger conventional military forces and nuclear options short of global nuclear war. Flexible Response marked a shift away from the previous policy of Massive Retaliation. While Kennedy believed nuclear deterrence remained paramount, he also understood that limited wars and low intensity conflicts should be fought with conventional weapons.

American and European security. To allay European concerns, the US stressed that SDI would be designed for the defence of Europe as well as the US.

During the 1980s, some 350 Scud ballistic missiles had been employed by Iran and Iraq in their "war of the cities."

The ABM Treaty prohibited development, testing, or deployment of ABM systems or components whether sea-based, air-based, space-based, or mobile land-based. It was, however, through the broadest interpretation of this treaty, which permitted research and experimental work prior to development that the US chose to define "development" as a phase which began with field testing of full scale ABM systems and components. In essence, this broad interpretation permitted development and testing, but not deployment. Dubbed as "Star Wars", SDI remained an R&D effort for missile defence but the vision of President Reagan's missile defence lived on beyond the Cold War.

POST-COLD WAR RESURGENCE OF MISSILE DEFENCE

The Berlin Wall came down and with the demise of the Soviet Union, a new post-Cold War era was dawning. With the dissolution of the Warsaw Pact, and the collapse of the Soviet Union, Armageddon-like strikes were no longer relevant. During the 1980s, many Third World countries assigned a high priority to the acquisition of ballistic missiles. The waning of direct threats to US national security from the Soviet Union and the rise of more general threats to international stability that are nevertheless inimical to US interests over the long term, required a well thought out strategic response. The stark consequences of ballistic missile proliferation in the developing world were seen by millions of people around the world. Indeed, during the 1980s, some 350 Scud ballistic missiles had been employed by Iran and Iraq in their "war of the cities".

The employability of ballistic missile in war-fighting was demonstrated in the 1991 Gulf War and was decisive in bringing missile defence to the

forefront once again. Saddam Hussein launched over 68 Scud missile attacks against US forces and targets in Saudi Arabia and Israel.[14]

The lessons from the Gulf War have been crucial for the resurgence of missile defence.

- First, reliance only on deterrence through the threat of retaliation will not prevent unstable dictators or terrorist nations from acquiring and using ballistic missiles.
- Second, it is unlikely that preemptive strikes could destroy all launchers before their missiles are launched.
- Third, the Patriots, irrespective of their limited success, demonstrated that it is possible to intercept ballistic missiles in flight.
- Fourth, defences need not work perfectly to be useful.
- Fifth, defences that cost more than the attacking weapons can be well worth the price— just ask the citizens of Tel Aviv and Riyadh.

The collapse of the former Soviet Union and the Gulf War provide compelling evidence that defence against ballistic missile attack is more imperative than ever. Thus, the focus altered to consider how to defend against limited strikes from anywhere in the world.

***Global Protection Against Limited Strike* (GPALS)**

The Gulf War, 1991, shifted the perception from the strategic to the theatre ballistic missile threat. With ballistic missiles and weapons of mass destruction (WMD) proliferation in the developing world, SDIO was reorganised into the Ballistic Missile Defence Organisation (BMDO). The refocussed programme, which sought to increase SDI's emphasis on theatre missile defence, was called "Global Protection Against Limited Strikes" (GPALS).

14. On January 17, Iraq launched its first Scud missile. The Scuds had limited range and accuracy but were useful weapons of terror. Coalition intelligence had underestimated their numbers and failed to account for them in the war plans. Hussein was using them to break the Coalition. By firing them at Israel, he hoped to draw that country into the war, knowing the Arab nations would not fight alongside Israel. And he fired them at Saudi Arabia to try to convince it that it was too risky to host the Coalition. <www.centennialofflight.gov/essay/Air_Power/gulf_war/AP44.htm>

Under the GPALS programme, the objective was to protect the US forces deployed overseas as well as allies, by destroying the warheads of limited ballistic missile strikes (up to 200 warheads) launched from anywhere on earth. GPALS envisaged three elements of defence, working in concert to provide the best possible protection against limited ballistic missile attacks.

Iraq's firing of Scuds and no clear evidence of successful intercepts by Patriots became a serious embarrassment for the SDIO and a setback for the GPALS programme.

- First, it would consist of stand- alone defences against theatre or tactical ballistic missiles, to be located in battle areas or at sea.
- Second, it would be a ground- based system of some 750 interceptors to be deployed at about six sites in the US.
- Third, a space- based tier consisting entirely of about 1,000 "Brilliant Pebbles". The emphasis and priority would be to develop theatre defences to protect US forces against cud type missiles, as gleaned from the Gulf War.[15]

"Brilliant Pebbles" became the centrepiece to the overall architecture, with each small space-based interceptor stationed between 800 to 1,600 km apart in orbit, with the ability to defend against up to 200 warheads. The constellation of Pebbles would also defend against limited strikes of single warhead tipped missiles. However, the research and development of this programme exceeded the limits of the ABM Treaty. Negotiations were held with the Russian government for a more cooperative and flexible arms control regime than the ABM Treaty.

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15. <http://www.globalsecurity.org/space/systems/gpals.htm>

***National Missile Defence* (NMD)**

Proliferation of missile technology and nuclear weapon technology in the developing world became rampant and the concerns of policy-makers and experts of geo-politics grew on account of the exposure of vulnerabilities. Various reports resurfaced advocating development and deployment of missile defence. Many countries, mainly China, Iran and North Korea amongst them, were developing missile technology especially the long range one, and the term "proliferation" emerged as one of the most contentious issues in the geo-strategic balance of power.

The Rumsfeld Commission's[16] findings in 1998 provided that the world-wide proliferation of weapons of mass destruction and their delivery vehicles posed a growing threat even to the continental US. The commission report gave a sort of warning of a "Nuclear Pearl Harbour" with more and more developing nations acquiring ballistic missiles and WMD, and their regional ambitions not welcoming a US role in their region. The Clinton Administration could not ignore the North Korean development and testing of long range missiles and WMD. In July 1999, the US formulated the National Missile Defence Act to deploy as soon as possible an effective NMD system against limited ballistic missile attacks, whether accidental, unauthorised or deliberate. Clinton's plan differed substantially from Bush's as it was based on continued adherence to the ABM Treaty in its narrow interpretation. It called for 20 ground-based missiles, ignored Brilliant Pebbles and did not put high priority on the possible eventual development of a more robust defence of the entire nation.

The testing and deployment of an NMD system envisaged significant amendments to the ABM Treaty. The Russians agreed to permit modernisation of theatre missiles previously limited by the ABM Treaty and with this joint agreement,[17] the US could improve its THAAD (theatre high altitude area defence) missile up to a velocity of five kilometres

16. Report of the Commission to Assess the Ballistic Missile Threat to the United States, July 15, 1998 <http://www.fas.org.>

17. "Ballistic Missile Defence", Research Paper 03/28, March 2003,<www.parliament.uk/commons/lib/research/rp2003>

per second so long it is tested against a missile below the speed of an ICBM. This was an important agreement as during reentry, an incoming warhead could be intercepted by an upgraded THAAD.

Further US efforts to amend the ABM Treaty to allow even a limited national defence were not agreed to by Russia. Nevertheless, the Ballistic Missile Defence Organisation (BMDO) was given a revived mandate to develop limited ground-based defence and its deployment was held in abeyance depending on assessment of threat.

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The 21st century threats as recognised by the Bush Administration called for the move beyond the constraints of the ABM Treaty to tackle emerging threats and to stem the proliferation of WMD. After the events of September 11, the Bush Administration gave a further push to the missile defence programme. The major concern of the US is not a heavily armed state or superpower rival but the capabilities that small and medium powers/ non-state actors might acquire in the near future. These suppositional threats are the reasons forwarded by the US to abrogate the ABM Treaty and pursue development and deployment of missile defences. On December 13, 2001, the US formally approached Russia about its intention to withdraw from the ABM Treaty in six months. The US withdrew in June 2002 from the ABM Treaty. In December 2002, US President George W. Bush directed the US Department of Defence to begin fielding limited missile defence capabilities. BMDO was renamed as the Missile Defence Agency (MDA). The Administration has also eliminated the distinction between "national" and "theatre" missile defences. By late 2004, MDA fielded a system at Ft. Greely, Alaska, and another two at Vandenberg Air Force Base, California, to provide a limited defence capability to intercept and destroy a ballistic missile launched from North Korea or Iran.

The USA is developing multiple systems for each of the three phases (boost phase, mid-course phase and reentry phase) and plans to integrate them altogether into one overall 'system of systems'. So it is important to understand that this is not just one system or a new weapon like a new submarine or a new jet fighter, it is a vast, integrated, cutting edge network of weapon systems that are being developed simultaneously, some in partnership with other countries. The United States is developing a multi-layered missile defence system. In order to counter tactical ballistic and cruise missiles, the US Patriot Advanced Capability (PAC-3) missile[18] mounted on a mobile platform, has already been in operation and has been utilised in the battlefield. The sea-based Aegis system[19] and THAAD[20] are designed to provide defence against medium range missiles. The shield against short and medium range missiles usually covers specific objectives and limited areas (or theatres) and is, therefore, referred to as theatre missile defence (TMD)[21]. Interceptors of the missile defence shield against long range missiles (known as ground-based mid-course defence – GBMD)

18. Patriot Advanced Capability (PAC-3) missile, through the use of advanced hit-to-kill technology enables target destruction, i.e. tactical ballistic and cruise missiles. The missile was first deployed during Operation Iraqi Freedom in March/April 2003.

19. Aegis Ballistic Missile Defence is the sea-based element of the Missile Defence Agency's ballistic Missile Defence System that has been tactically certified, deployed and contributes to the ongoing BMD system under development. Aegis Ballistic Missile Defence leverages and builds upon capabilities inherent in the Aegis Weapon System, Standard Missile, and Navy Ballistic Missile Command, Control, Communications, Computers, and Intelligence systems.

20. Terminal High Altitude Area Defence (THAAD), formerly Theatre High Altitude Area Defence, is a United States Army project to develop a system to shoot down short- and medium-range ballistic missiles over a theatre or region by ramming them with interceptor missiles. THAAD missiles have an estimated range of 125 miles (200 km), and can reach an altitude of 93 miles (150 km). The upper-tier THAAD addresses critical requirements to intercept longer-range theater-class ballistic missiles at high altitudes.

21. TMD systems defend territory or military forces by tracking incoming ballistic missiles with radar and launching interceptor missiles to destroy them. TMD systems can be ground-based, sea-based, or air-based and can use information about incoming missiles gathered by surveillance satellites to increase their effectiveness. Lower-tier systems such as the Patriot PAC-3 system defend a relatively small area (or footprint) against shorter-range missiles (up to 1000 km). Upper-tier systems such as the Navy Theatre Wide (NTW) system intercept incoming ballistic missiles at a higher altitude and can therefore defend a larger area against longer-range missiles (up to 4,000-5,000 km). TMD systems use some of the same technology as NMD, but are unable to intercept very-long range intercontinental ballistic missiles (ICBMs).

are installed at Alaska and California, intended to defend against missile launch from North Korea. Negotiations for a 'third site' in Central Europe are underway for catering to long range missile attacks from the Middle East, notably Iran. In Central Europe, the radar site is proposed in the Czech Republic and ten ground-based interceptors deployment in Poland has been negotiated. The boost phase intercept systems being researched and under development are, firstly, the US Air Force's airborne laser (ABL) which is converting the Boeing 747 for oxygen iodine chemical lasers to shoot down missiles in their ascent phase; secondly, using unmanned aerial vehicles (UAVs) to launch high speed interceptors (Global Hawk); thirdly, space-based laser through constellation of satellites each carrying a hydrogen-fluoride chemical laser and onboard sensing and surveillance equipment; and, fourthly, forward deployment of the Aegis system as a possible sea-based boost phase interception system.

The important point is that the US missile defence programme is open-ended; it has no set end point.[22] The development and deployment of these systems is evolutionary; as and when new technologies are researched and new ideas come to fruition, they will be developed and deployed, integrated into the network and improved.

RESPONSE TO US WITHDRAWAL FROM ABM TREATY AND NMD

Though the ABM Treaty was bilateral, US withdrawal from it posed various strategic issues worldwide. Russia, China, and the NATO-European countries raised serious questions about a future arms race involving other countries worldwide. The Bush Administration made it clear that it considered the treaty a Cold War relic and wanted to scrap it in order to proceed with testing for a new missile defence shield. The United States was sceptical about the nuclear deterrent posture being able to dissuade states from developing missile technology and deter attacks from those who do. Russian leaders condemned this unilateral approach and issued dire warnings of the

22. "National Policy on Ballistic Missile Defense Fact Sheet" < http://www.whitehouse.gov/news/releases/2003/05>

The case for abrogation of the ABM Treaty and deployment of missile defence as put forward by the Bush Administration was contentious and debatable.

detriment the American decision would cause to global strategic security. Russian legislators condemned the US withdrawal from the ABM Treaty and strongly criticised it as "a serious political mistake".

In the post-Cold War strategic situation, both Russia and China see the prime threat to their security stemming from the United States, whereas the United States sees the primary near term threat as missile proliferation in countries of concern and from non-state actors, aided and abetted by these countries of concern. The UK and France focus on residual threats from Russia and long-term threats from WMD proliferators, neither of which are immediate or pressing. In addition, the relationship among nuclear weapon states (NWS) has also changed. What was a core bilateral relationship is now variously described as a unilateral, trilateral or multilateral relationship. Hence, concerns of the US that threats from states possessing limited WMD and missile capabilities would not be deterred by the threat of annihilating retribution are not shared elsewhere. This disjuncture underlies the international debate and friction over missile defence and missile proliferation.[23]

The case for abrogation of the ABM Treaty and deployment of missile defence as put forward by the Bush Administration was contentious and debatable. US projection of its threat perception is that it is not from a heavily armed superpower but from the offensive capabilities of those smaller states that might acquire these missiles at some unknown point in the future.[24] Further, in a hypothetical case of emergence of a new threat, missile defence could not be the obvious choice as it was still not proven to be hundred percent effective and take on saturation strikes of hundreds of missile

23. Tomas Valasek, "Europe's Missile Defense Options", *The Defense Monitor*, vol. 30, no 3, March3, 2001< www.cdi.org>

24. Gary Brown and Dr Gary Klintworth, "The US National Missile Defense Program: Vital Shield or Modern-Day Maginot Line", December, 2000, Research Paper 16 <http://www.aph.gov.au/library/pubs/rp/2000-01/01RP16.htm>

attacks in a theatre or to the continental US. It is debatable that till date nuclear deterrence and retribution has been the trusted US tool against the USSR and China and now it is mysterious as to how the US is challenged by such smaller and weaker opponents against whom US nuclear deterrence is estimated to be of no value. The logic of denigration of deterrence is arguably flawed, as even today, till the time the leak-proof full-fledged NMD is deployed, deterrence is still the only tool available.

The more ambitious the goal of defence becomes, the higher and further out the intercepting weapon's reach, the more the ambiguity arises.

The US view that failure to deploy missile defences provides incentives for missile proliferation has been dismissed by geo-political strategists worldwide as deployment of missile defence would evoke an offence-defence arms race. The more ambitious the goal of defence becomes, the higher and further out the intercepting weapon's reach, the more the ambiguity arises.

- First, the interceptors cannot reliably be discriminated from other offensive ballistic missiles and, thus, create threat perceptions which will lead to increased arms build- up.
- Second, an accidental or unintentional launch of an interceptor or an object erroneously entering one's air space, could spell crossing the threshold from crisis to war. With the unavailability of time, political control is impossible.
- Third, any interceptor for exo-atmospheric interception of ballistic missiles is inherently suited to destroy satellites in low earth orbits, thus, complicating the issue as misunderstandings or unclear events could lead to war.
- Fourth, it is important to note that once a ballistic missile launch is detected, its launchers and storage site can be traced to pin- point accuracy and because of the limited efficiency of anti- ballistic missile defences, it is likely that they will be supplemented by offensive strikes at the launchers before the second or even first missile is launched (possible through real-

time intelligence, surveillance, reconnaissance—ISR) leading to a crisis situation of offence-defence.

- Fifth, the adversarial states may take a variety of measures that might negate defences such as development of MIRV, MARV or decoys. Cheaper and complicating methods of delivery of nuclear weapons through cruise missiles or UAVs pose greater problems for the NMD.

Implications for Russia

The US argument to amend the ABM Treaty towards a flexible approach for development and deployment of tactical TMD and THAAD has been agreed to by Russia. But Russia declined any further amendment to the treaty for the development of a nationwide missile defence system.[25] This Russian stance provides that the modest development of TMD against so-called "irresponsible states" having a limited nuclear force, would not jeopardise its large nuclear force, however, NMD may prove dangerous as actual US plans were not known. Russia does not see any threat from smaller Middle Eastern states that possess very limited capability and believes that these states would not take the risk of attacking US nuclear forces, which would be suicidal.

Missile defence is likely to be even more important, supporting preeminence in space.

This type of scenario represents a 'high consequence but low probability' threat and, hence, Russia feels that the US rhetoric of such expensive development and deployment to cater for such a low probability threat is not the compelling reason. The US rebuttal that these systems are not aimed at achieving global hegemony has not been received well by Russia and China, especially when the ultimate aim could be to achieve outer space control. The implications of NMD deployment that relies on space-based components may open a Pandora's Box. With today's enabling technologies, it is hard to imagine a world without space-based capabilities supporting

25. Nikolai Sokov, "US Withdrawal from the ABM Treaty: Post-Mortem and Possible Consequences" < http://cns.miis.edu/>

soldiers, sailors, airmen and marines along the civil uses of space. Missile defence is likely to be even more important, supporting preeminence in space. Rebuffing the Outer Space Treaty for NMD deployment will have far-reaching consequences.

The initial response from the Russian Federation on the United States' secession from the ABM Treaty was restrained. It may be due to the fact that Russia's strategic readiness was undermined by financial and social pressures. However, Russia under Vladimir Putin has come out of its economic crisis and could once again rearm and rebuild. Russian military expenditure that was US$ 33 billion in 1988, plummeted to US $ 9 billion in 1998. This has since then been rising and in 2008, stood at US $ 70 billion[26]. Awash with energy generated cash, Russia could once again flex its muscle.

The continuing eastward expansion of NATO, especially losing some of its former Warsaw Pact allies to the West is a vexing issue for Russia. It feels encircled and threatened politically and militarily. NATO's war on Yugoslavia jolted Russia. Russia views the NMD programme as a real threat to its nuclear deterrent forces and to its national security. The following are the reasons of distrust:

- Russia sees no threat from Iran and WMD terrorism which necessitates such defences[27]. The US has declared that its calculation is not based on an assessment of threats to its national security but on an assessment of the capabilities of other nations to harm its national security. Being the only country that possesses such potential, Russia is sceptical about US plans of destroying its nuclear delivery vehicles.
- Russia is concerned about siting of the missile shield in Europe i.e. Poland and Czech Republic (both of them former Warsaw Pact countries). The radar to be deployed in the Czech Republic would be used to monitor or

26. "World Military Spending" <http://www.globalissues.org/article/75/world-military-spending>

27. Manpreet Sethi, "Current Trends in Nuclear Weapons Thinking and Strategies", in Jasjit Singh, ed., *Asian Defence Review 2007* (New Delhi: Knowledge World Publishers, 2007), Ch. 3, pp. 67-78.

spy on Russia. The US has not guaranteed that the siting of the radar and interceptors in the Czech Republic and Poland is limited to a single radar and only 10 interceptors and this will not be augmented with more radars and interceptors at different bases in Europe and also that they will not be equipped with boost phase interception capabilities.

- Russia is of the opinion that the US move to deploy a missile shield in Eastern Europe will trigger a new arms race. It is concerned that missile defence would lead to placement of weapons in outer space.
- Russia feels that NMD is only a stage, a first step towards the future emergence of a multifunctional global system for combating all types of missiles, aerodynamic and space targets and also surface targets.

Russian Response and Possible Developments

During 1990, Russia was in no condition to compete with the US and would have readied itself to concede global leadership to the US, and, thus, the response on US abrogation of the ABM Treaty was muted. Although Russia pointed out the problems of missile defence, undermining the strategic stability, it was not interested is being dragged into another arms race. But the US' ambitious desire of being the sole global power and its imperialistic approach hurt Russia many a times. The issues of missile defence and the Kosovo problem proved to be the Rubicon of East-West relations. The West demonstratively ignored Russia's position, and this was bound to evoke a response. So, the contradictions that have been building up between Russia and the United States since the late 1990s, emerged with the conflict in Georgia. Now, we are to witness the start of a new spiral in history— once again, a history of confrontation between two superpowers, each trying to build the world according to its interests.

Russia's influence in Eastern Europe is at stake and it is not prepared to renounce its position as it did in the 1990s. With Russia's consolidation, buoyed by a favourable economic situation and political stabilisation, it will try to regain its spheres of influence, at least in the post-Soviet space and Eastern Europe. The West may be indignant, but it will have to face reality

and there are political, as well as financial interests that would be damaged by a confrontation with Russia which would be too expensive to risk.

The effectiveness of a missile defence system is inversely proportional to the number of attacking missiles against it.

The cooperation in the global war on terror is growing now and cooperation in arms reduction and control has become secondary. It is obvious that Russia will equip its Topol-M missiles with multiple manoeuvrable warheads.[28] It may also arm various deployments with MIRVed missiles. Russia has already withdrawn from the Conventional Forces in Europe (CFE) Treaty in November 2007, and may also give up its unilateral commitments to reduce tactical nuclear weapons, separate warheads or redeploy in the middle of the country. Russia has hinted at positioning its ballistic missiles at the Baltic enclave of the Kaliningrad region and the short range nuclear capable missiles like the Iskender missile in Belarus.

The Strategic Arms Reduction Treaty-1 (START-1 Treaty) between the US and Russia will expire in 2009. The reduction of strategic offensive weapons will enhance the role of missile defence systems. The effectiveness of a missile defence system is inversely proportional to the number of attacking missiles against it. Therefore, it is rational to assume that Russia may keep the effective deterrent against the US missile defence shield and be assured that its retaliatory response would bring unacceptable damage to the enemy[29]. Russia has been hinting at withdrawal from the INF Treaty and has been laying the groundwork for withdrawal by characterising the emplacement of the US GBMD installations in Europe as a reason which is detrimental to its security planning. Having withdrawn from the INF Treaty, Russia would be free to once again begin construction of intermediate-range ballistic missiles (IRBMs) as a means of levelling the playing field. A barrage of several dozen

28. Martin Sieff," Russia Boosts Topol ICBM to beat US Defenses" < http://www.upi.com/Security_Industry/2008/09/03>

29. Yuri Zaitsev, " Russia May Put Nukes on Missiles in Kaliningrad" < http://www.upi.com/Security_Industry/2008/09/03>

IRBMs could easily overwhelm a small squadron of BMD interceptors based in Europe as well as any system that the United States may conceivably field in the next 20 years. This is not an option that would buy Russia parity with the United States, nevertheless, Russia could use a new IRBM force to threaten Europe and resurrect a host of diplomatic options that served the Kremlin interests very well in the past.[30]

In a symbolic move, two Tupolev Tu-160 nuclear bombers which were sent to Venezuela on September 10, 2008, carried out a six-hour patrol over the Caribbean Sea. If Russia permanently deploys its Tu-160s in Venezuela, the United States could be at greater risk than at any time since the darkest days of the Cold War.

The Mach-2, super-long-range Tu-160s can carry standoff X-555 cruise missiles with a range of 2,000 miles. That means that from a base in Venezuela, they could 'loiter' over the Caribbean for 10 or more hours at a time, with a capability of firing their Mach 2.8 cruise missiles that are capable of flying at sea level and hugging ground contours so their exact flight path cannot be intercepted in advance and with a range that can hit almost any target in the entire United States.

Since the end of the Cold War, the United States has let virtually all its domestic defences against manned bomber attacks vanish. The Blackjacks would fly well "under the umbrella" of even the 'PAC-3' and US Navy's Standard Missile-3 anti-ballistic missiles systems, none of which are designed for manned aircraft interception. The cold fact is that the United States currently has no missile defence system capable of knocking down a Blackjack missile attack except combat aircraft.[31]

With this return to the Cold War situation of a direct confrontation between US and Russia, with a substantial nuclear arsenal, the old inviolable logic of mutual assured destruction reasserts itself.

30. Nathan Hughes and Peter Zeihan, "The INF Treaty: Implications of a Russian Withdrawal", Stratfor, February 2007 <http://www.stratfor.com/inf_treaty_implications_russian_withdrawal>

31. Martin Sieff, "BMD Focus: US Vulnerable to Tu-160s" (UPI- September 17, 2008) < http://www.spacewar.com/reports>

European Perspective

The initial European response to the US withdrawal from the ABM Treaty was sceptical. For European states, the fact that Iran and Syria are developing ICBMs does not automatically represent critical danger and they were not forthcoming to define these Middle Eastern developing missile capabilities as threats beyond political (economical) amelioration. European analysts noted that the intense US concern about the potential for nuclear missile attack is at odds with NATO's current strategic doctrine, which states that the threat from nuclear weapons is extremely remote.[32]

Led by France and Germany, many European allies expressed concerns that the proposed NMD would damage relations with Russia, endanger arms control and decouple US and European security. They argued that Russia will identify the European Union (EU) as a US led strategic bloc and, thus, become suspicious of its intention, with a possible negative fallout on the European economy and energy needs. The logical consequence would be that the United States' European partners would become more attractive as targets for those who oppose US actions. During the foreign ministers meeting in December 1999, the US laboured the case, allaying the fears of NATO towards security and proliferation of nuclear weapons and missiles. Despite strong US campaigning, NATO countries remained muted as no one displayed enthusiasm or was absolutely critical, with the exception of France, whose President, Jacques Chirac, has been outspoken in his criticism of the US NMD plans.[33]

However, the EU's disunity on crucial strategic issues such as the Iraq War, Turkey's accession and energy policy pushed the US towards bilateral agreements on NMD issues. Negotiations between the US-Poland and US - Czech Republic on the deployment of elements of the US GBMD have been conducted strictly bilaterally and not in NATO's context. Nevertheless, the US has finally achieved its long-term goal of setting up a BMD system in

32. Steven A. Hildreth and Carl Ek, "Long-Range Ballistic Missile Defense in Europe", CRS Report, July 2008< http://www.fas.org/sgp/crs/weapons/RL34051.pdf>

33. Wade Boese, "NATO Ministers Skeptical of US NMD Plans", December 1999 < http://www.armscontrol.org/act/1999>

BMD technology has advanced considerably and is now far more likely to work.

Europe. Europe will end up having missile defence facilities installed on its territory but without being in control of them.

For the Central European states, the benefits of such deals are obvious. Most of these states fear a future conflict with Russia, and anything they can do to solidify a military arrangement with Washington is, to their thinking, a benefit in and of itself. But even in Western Europe, further removed from the Russian periphery, opposition to the United States' BMD programmes seems to have relaxed considerably. There are several reasons for this change.

The New European Logic

The Czech Republic and Poland are not the only European states to have changed their thinking about BMD either. A number of countries are not only are responding warmly to US overtures facilities, but, in some cases, are actually initiating the siting requests.

- First, BMD technology has advanced considerably and is now far more likely to work.[34] When BMD was only a political tool and could offer no real protection, the Europeans were understandably squeamish about participating in the system. But if the system is actually functional, the calculus shifts.
- Second, a weak BMD system designed to guard against Iran theoretically could evolve into a stronger system that helps to protect Europeans against Russia in the future. And at a time when Moscow is growing more aggressive in economic and political terms, laying the groundwork for a military hedge makes sense.

34. Since 2001, 34 tests out of 41 were successful. These include six of nine successes against long range targets, with four using warhead decoys or counter-measures, Employing layered defences, a redundant network of land-based and sea-based sensors and advanced algorithm, ability to defeat counter-measures will be greatly improved in the future, with the introduction of capability to destroy many objects with a single interceptor. (Lt Gen Henry A. Obering III, Response to "Missile Defence Malfunction", Carnegie Council- Ethics in International Policy, May 30, 2008, < www.cciea.org/resources/journal/22-1>)

- Third, it is becoming increasingly difficult for Europeans to define their security interests as separate from those of the United States'. Moscow's new energy strategy is a tool for exerting influence over Europe, making the European states more willing to view Russia through American goggles. BMD fits into the strategic doctrine, and that logic, by association, is now taking hold in Europe.
- Fourth, there is a desire to rope the United States into a multilateral defence stratagem within the framework of NATO. Many Western Europeans begrudge US efforts to dominate the NATO alliance and regularly try to persuade Washington to more seriously consider the European points of view.
- Finally, there is the old axiom "If you can't beat them, join them". Bilateral US security agreements with the Central European states are forging BMD into reality. If it is going to happen anyway, the logic goes, you might as well jump on the bandwagon and reap some of the benefits.

Implications for China

While China has vehemently opposed the US NMD, its opposition to US missile defence efforts has been consistent since the SDI days. Chinese concern over missile defence is due to the dangers of possible nuclear blackmail, unipolarity and the United States' superpower status, the US and Japan alliance on missile defence, and the US assistance to Taiwan. In China's perspective, it is untenable that the US would spend over $100 billion on a system that has only one or two countries in mind, the so-called 'rogue states' which are yet to possess the capability of developing an ICBM. US plans of provisioning TMD systems or technology to Taiwan is a serious concern of China. China considers it an act of attack on its sovereignty and it would lead to the outbreak of a missile race across the Taiwan Strait. It believes that the US is exaggerating the threat as a pretext to garner Japanese assistance in missile defence R&D and to contain China.

In 1998, the North Korean missile launch was followed by the US -Japan agreement in August 1999 for joint development of an advance missile sensor,

Although China is most vocal in its opposition to TMD, it is actually NMD that presents the greater strategic challenge to Beijing.

advance kinetic warhead, second stage propulsion and light weight nose cone design for the navy theatre-wide missile system. China has opposed the US-Japan TMD cooperation stating that the TMD and NMD are closely related and cooperation on TMD would change the nature of the US-Japan military alliance wherein it will encourage Japan to improve its defence industry and shift towards the offensive posture from its present defensive strategy.[35] This would aggravate the tension in the Korean peninsula.[36] China objects to TMD because:

- It would integrate Taiwan into the US-Japan security alliance
- It further elevates the role of Japan in regional security.
- It signals America's intention to strengthen its military presence in the region and prevent China's emergence as the predominant regional leader.

Although China is most vocal in its opposition to TMD, it is actually NMD that presents the greater strategic challenge to Beijing. China's perspective of the US NMD programme is that it will downgrade or negate China's nuclear deterrent which is the smallest (about 20 ICBMs) amongst the five nuclear powers[37]. China has accelerated its ICBM modernisation. It has tested the DF-31, an 8,000 km range (capable of reaching the west coast of the US), solid-fuelled (quick launch capability), road-mobile missile and is developing a longer range version called the DF-41. These modern missiles could carry multiple warheads with decoys, which could help warheads to penetrate missile defences. But

35. Zhu Mingquan, "US Plans On National Missile Defense (NMD) And Theater Missile Defense (TMD): A Chinese Perspective" < http://www.nti.org/db/china/engdocs/zhu1999.htm>

36. Duan, "Tmd, US-Japan Relations, and East Asian Security", The United Nations University, Tokyo, Japan, June 2000, <www.nautilus.org/archives/nukepolicy/TMD-Conference/duanpaper.html> Evan Medeiros, "Issue Brief: Theater Missile Defense and Northeast Asian Security", Monterey Institute of International Studies, August 2001 (Reviewed January 2003)< http://www.nti.org/e_research/e3_3a.html>

37. Charles D. Ferguson, "Bait and Switch: Is Anti-North Korean Missile Defense Designed for China?" *Journal of the Federation of American Scientists,* vol. 52, no. 6, December 1999<http://www.fas.org/faspir/v52m6b.htm>

even though China is modernising its missile force, it still wants to avoid the expense of a massive-strike capability, which would involve hundreds of missiles, and divert funds badly needed in other areas of the military. Matching the US missile for missile or developing a Chinese NMD would require diverting huge money and resources which would be detrimental to Chinese economic growth and emergence as a world power.

Thus, China's space denial effort has provided it asymmetric capability to hedge against the United States' formidable might.

China also appreciates that the confrontation with the US through conventional war-fighting would be suicidal and, thus, China has adopted a diplomatic offensive posture to oppose US NMD efforts in multilateral fora. China also tried to engage the US in the Conference on Disarmament (CD) and Prevention of Arms Race in Outer Space (PAROS) which was rebuffed by the US.

At the same time, Chinese efforts to overcome the US might have come to the forefront with the successful launch of an anti satellite missile in January 2007. As Ashley Tellis put it, "Chinese analysis of US military operations in the Persian Gulf, Kosovo and Afghanistan have yielded one crucial insight: The advance military might of the United States depends inordinately on a complex, exposed network of C4-based systems, through the medium of space. Chinese strategists quickly concluded that any effort to defeat the formidable military power of the US should aim not at its capacity to deliver conventional firepower from long distances but its Achilles heel: its space-based capabilities and their related ground installations."[38] Thus, China's space denial effort has provided it asymmetric capability to hedge against the United States' formidable might.

Implications for India

With the US-NMD deployment in Europe and sharp reaction from the Russian

38. Ashley J. Tellis, "Punching the US Military's Soft Ribs:China's Antisatellite Weapon Test in Strategic Perspective", *Carnegie Endowment for International Peace*, June 2007.

"Sandwiched between two adversaries that work in close strategic collaboration and confronted with real missile threats, if there is any country that needs an NMD, it is India…"

Federation and China, the potential impact of NMD on South Asia cannot be neglected. With the agreement of deployment of the US NMD in the Czech Republic and Poland, the potential impact of NMD on global arms control and on international security dynamics, is bound to influence Indian strategic planning with reference to China and Pakistan.

The US NMD programme and US-Japan-Taiwan TMD/NMD cooperation is forcing China to enhance its strategic deterrent by modernising its missile forces and space denial capability. As China's strategic posture changes, it will influence India's threat perception and subsequently any Indian reaction will influence Pakistan's strategic planning against India. Chinese interpretation of US-Taiwan and US-Japan TMD cooperation as a violation of the Missile Technology Control Regime (MTCR) provides it a suitable excuse to assist Pakistan above the MTCR limits, which will destabilise the regional strategic balance.

The principal driver behind India's nuclear posture is the doctrine of equality in security and disarmament. India's perception on nuclear proliferation and disarmament is through a globally negotiated, time-bound and verifiable disarmament regime and, therefore, India has been a non-signatory to the nuclear Non- Proliferation Treaty (NPT) all this while, despite strong international pressure and sanctions, as India considers the NPT in its present form discriminatory. The US NMD threat to China and Russia will exacerbate the Chinese build-up of an advanced missile arsenal in qualitative as well as quantitative terms, which will signal an arms race in South Asia.

The relationship between India and Pakistan has been even more complex and difficult. The nuclear capabilities of both countries, with their history of past conflicts, leave no ground for complacency, with the attendant risks that may ensue.

The sudden collapse of the Soviet Union forced India to shift its strategic interest towards the US, Israel and Europe. Indian interest in acquiring the

TMD systems such as the Israeli Arrow or US Patriot advance capability system is a move to ensure its credible minimum deterrence and to contain increasing Pakistan's missile capability which is supported by China covertly. As Dr Manpreet Sethi puts it, "… Sandwiched between two adversaries that work in close strategic collaboration and confronted with real missile threats, if there is any country that needs an NMD, it is India…"

The Chinese anti-satellite test on January11, 2007, was astonishing. The technology used to shoot down a satellite is the same as in an anti-missile system. The system has to be slightly reprogrammed to adjust speed in the case of an ICBM. This Chinese development merits serious consideration which makes Indian space-based capabilities vulnerable. Thus, China not only has a credible anti-missile system but also possesses the asymmetric capability to strike war-fighting space-based assets.[39]

The implications of BMD are far too many. India has to stretch its capabilities in multiple spheres, i.e. IRBM, ICBM and cruise missile development qualitatively and quantitatively, achieve the triad of missile launch capability, the ground-based as well as sea-based TMD acquisition and deployment, anti-satellite capability to negate space vulnerability, China's technological advances and 'proxy' space power in Pakistan.

India has ventured into the missile defence programme and its indigenous missile defence effort has also been successful in its first testing of endospheric as well as exospheric modes. It is important to note that India is also moving toward increasing "foreign collaboration," (like the Brahmos programme) to leverage and learn from the wealth of design experience already available. With the India-US nuclear deal coming to fruition, BMD cooperation would also represent a new avenue for enticing India into further strategic alignments with Washington. Though, Japan and Israel have been the Pentagon's strongest partners in development and operational fielding, India would be a noteworthy addition to this field. However, Moscow still holds significant sway with New Delhi. Should these efforts begin to succeed,

39. Srikanth Kondapalli, "China's Satellite Killer: Should India Worry?" January 24, 2007, < www.rediff.com/news >

Some missile defence is evidently better than no missile defence. It is a strategic compulsion.

Pakistan could eventually see the credibility of its nuclear deterrent meaningfully degraded. [40]

The India-US nuclear deal which has recently received the approval from the Nuclear Suppliers Group has boosted India's stature significantly as an international nuclear power and will elevate its stand in the regional security dynamics. It has also brought India closer to the US strategically. All these development will have a negative fallout in the South Asian security context and, thus, Indian effort to acquire a hedge against the capability of China and Pakistan, individually as well as collectively, is a necessity.

CONCLUSION

Missile defence is no panacea and does not guarantee fail-safe operations and survivability of innocent non-combatants. Any amount of sophistication cannot provide 100 percent safety from missile attack and the possessor of NMD will always be vulnerable, may be with less risk, but potentially high consequences.

Still, missile defence has value in limiting the damage. It adds uncertainty to the calculation of any potential attacker. Some missile defence is evidently better than no missile defence. It is a strategic compulsion. There is hardly any chance of development and deployment of nuclear tipped missiles in the strength as that of the US and USSR arsenals during the Cold War. It is not feasible for any country and, therefore, a missile defence shield makes sense because it would be effective against a smaller arsenal.

Further, as Rajesh Basrur [41] puts it: "...Notwithstanding all the perfectly sensible objections to missile defence— that it is technologically questionable, that it is too expensive and that it is unlikely to work very well – its legitimacy lies in its capacity, regardless of the level of its sophistication and its operational

40. "India, US: The Potential for Ballistic Missile Defense Cooperation", Stratfor, January 18, 2008,< www.stratfor.com >

41. Rajesh M. Basrur, "Missile Defense and South Asia: An Indian Perspective" <www.stimson.org/southasia/pdf/SABMDBasrur.pdf>

effectiveness, to enable a significant number of people to survive a nuclear strike…" It has become a moral necessity for a country.

The debate over missile defence has settled in favour of missile defence not because defences have an edge over offensive weapons but due to the strategic compulsions.

Sixty years ago, the world's first missile (V2 missile) attacks showed the need for missile defences and the Gulf War reimposed that need. Today, the threat is lurking real and substantial, but the technology of today has allowed missile defence to be a reality. Today, more than 15 countries (including nearly 10 in NATO alone) are engaged in missile defence efforts of some kind, whether by hosting key facilities or assets on their territory or actively discussing this possibility, pursuing R&D programmes, signing cooperative agreements with the countries that possess the technology or maintaining capabilities. The list includes the United States, United Kingdom, Australia, Denmark, France, Germany, Italy, Israel, India, Japan, the Netherlands, Taiwan, South Korea, Ukraine, Poland and the Czech Republic. Russia also believes in the value of missile defence as it continues to maintain a missile defence system around its major population centre, Moscow, and has developed defences against shorter-range missiles.

The debate over missile defence, about its viability and effectiveness against the threat of ballistic missile, is settled in its favour. It had settled in the favour of missile defence not because defences have an edge over offensive weapons but due to the strategic compulsions. BMD is yet to be proven in an actual battle scenario. Nevertheless, the advancement in technology provides that whether or not the system is viable, it is a new mantra in the present strategic context. The end of the Cold War and emergence of a different world equation premised that newer methods of counter-balance have to be adopted, shunning Cold War beliefs and *vox populi* and with the complex, international and regional security dynamics, along with fast pace of technological advancement in missile lethality, accuracy and range, missile defence has become the "Frontier of the 21st Century".