Development of Pakistan's Ballistic Missiles: Implications for India

Vinod Anand and Neha Kumar

Introduction

Missiles have emerged as an important weapon of deterrence since the use of V-1 and V-2 rockets by Germany. The invention of the missile was considered revolutionary because it could travel from one country to other in the shortest possible time and could inflict unbearable heavy damage on the enemy's population and economic centres. It was also realised that missiles have a great psychological effect on the civilian population due to which a government may be forced to give up war, and compromise according to the terms of the adversary's government. The importance of missiles increased during the nuclear age because, as effective means of its delivery, missiles increased the utility of the nuclear weapon. Even if missiles do not carry a warhead, they could inflict large scale damage on the civilian population due to its debris. The absence of any effective defence against missile attacks makes them more important to the various countries.

The possession of nuclear weapons and ballistic missiles by India and Pakistan has been viewed with concern by the international community due to many reasons, such as:

- Poor command and control structure.
- Missiles can travel in the short span of 4-5 minutes, thus, increasing the risk of accidental attack.
- Historical conflicts between the two countries could escalate to a nuclear war, as was evident from the Kargil War of 1999 and the December 2001 attack on the Indian Parliament. During these events, both sides put their missiles on high alert; particularly Pakistan, due to its "first use policy" against India created a major problem in the sub-region.

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Between India and Pakistan, the international community is more concerned about Pakistan's nuclear and missile programme. It has been revealed from A Q Khan's network of proliferation that Pakistan has a poor command and control structure which could be dangerous for the international non-proliferation regime. Pakistan is an unstable state and it figures very high on the index of failed states; further, Pakistan's military exercises control over its nuclear weapons programme and, additionally, it is a growing hub of terrorists of many varieties. The ever present danger of nuclear weapons and their delivery means falling into the hands of radicals and extremists has alarmed the international community. Pakistan's missile-centric strategies pose a threat not only to the region in particular but to the international community in general.

Reasons Behind Development of Pakistan's Missile Programmes

Until the late 1980s, Pakistan focussed primarily on obtaining nuclear weapon capability and not ballistic missiles. After India's 1980 test of the long range Agni missile, the Pakistan establishment started focussing on the need to develop the means of delivering nuclear weapons with a high degree of certainty. Pakistan realised its inferiority as it had the Hatf-I and Hatf-II missiles at that time, and also lacked guidance and control functions.[1] With the development of Indian missiles, Pakistan began to see its security being more vulnerable than before. Pakistan missiles are India-centric and this was the prime reason for the development of Pakistani missiles. The other reasons are given below:

1. Pakistan was unable to build the aircraft needed to deter India because of sanctions imposed on it by the US for slowing down its nuclear development. The F-16 aircraft were Pakistan's main delivery systems against India. However, the US refused to supply additional F-16 aircraft and imposed sanctions on the country. Particularly after the 1998 nuclear tests, and instability in Pakistan, the United States was unwilling to supply nuclear capable aircraft to it. Pakistan is unable to develop these aircraft due to its economic compulsions and technical backwardness. On the other hand, India was acquiring state-of-the-art aircraft from Russia and France. In order to balance India's growing superiority, Pakistan decided to acquire ballistic missiles. Therefore, the missile programme along with nuclear programme became the top priority of the Government of Pakistan.[2]
2. Pakistan began to regard investment in ballistic missiles as profitable because it offered the maximum costs to benefit ratio when faced with the Indian challenge. As compared with aircraft, missiles could deliver

warheads a short period of time and with improved capabilities, and by adoption of a number of tactics, they could be in a position to even defeat sophisticated air defence systems. The missile programme of Pakistan is largely dependent on the help of other nations. The missiles in the initial stages were inaccurate and, therefore, could have been said to be not suitable for military targets but increasingly Pakistan has been acquiring technical capabilities to improve their circular error of probability (CEP). However, their use against counter value targets remains the first priority of the Pakistan military planners, according to what is generally known about their nuclear doctrine which has not been spelt out officially in detail so far. Their use lies in inflicting damage on civilian populations and producing terror in their mind. As Aron Crap has observed:

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> The essence of warfare is not measured purely in terms of destruction but in the ability to use force and threats to achieve political goals. Weapons that intimidate or panic an adversary have a military role that is different but not necessarily less than that of weapons more effective in killing and destroying.…Ballistic missiles lead ordinary people and their political leaders to react with anxiety, even after they are certain that the missile will reach them with conventional explosive.[3]

3. Several reports suggest that the Khan Research Laboratories (KRL) were in fierce competition with the Samar Mukarak Mund National Defence Complex (NDC) which has given a boost to the Pakistan missile programme. This competitiveness resulted in two separate missile programmes with similar range configurations. The end result was the development of the KRL's 2,300-km range of Ghauri-II and NDC's 2,500-km range Shaheen-II and later prospect of 3,000-km range Ghauri-III. According to one analyst, "The rivalry came to the surface after the May 1998 nuclear explosion, with both claiming credit for the nuclear tests. There is a clear rift between the two. It became fairly embarrassing for the government and sources say that

Nawab Sharif himself intervened between the feuding scientists to ask them to not to make their differences apparent in public."[4] Therefore, much of the missile programme after 1998 was developed due to a fierce competition between the two organisations.

Pakistan's Missile Development

> Pakistan's ballistic missile infrastructure is now more advanced than that of North Korea. It will support development of a missile of 2,500-km range, which we believe Pakistan will seek in order to put all of India within range of its missiles. Through foreign acquisitions and beginning without an extensive domestic science and technology base, Pakistan has acquired these missile capabilities quite rapidly. China and North Korea are Pakistan's major sources of ballistic missiles, production facilities and technology.
>
> – Rumsfeld Commission Report 1999 (USA)[5]

The above statement of the Rumsfeld Commission underlines two important things. First, the only aim of Pakistan is to bring all of India under its missiles' reach. Second, Pakistani missile development largely depends on the assistance of China and North Korea. In order to discuss Pakistan's missile development, this section is divided into three main categories:

- Pakistan's missile arsenal.
- External dependence.
- Implications for India.

Pakistan's Missile Arsenal

The history of Pakistan's missile development can be traced back to the Space and Upper Atmosphere Research Commission (SUPARCO) in 1961. On February 5, 1989, after India's first Agni test, Pakistan's Chief of Army Staff Gen Aslam Beg announced the testing of two types of Hatf missiles. This was the beginning of Pakistan's missile programme.[6] The other details of Pakistan's missile programme, along with their operational status and strategy, are given in Table 1.

Table I: Pakistan's Missile Capability and Operational Strategy

Missile	Year of testing /acquisition	Range in km	Warhead weight in kg	Propulsion stages/propellant	Origin	Status	Strategy
Hatf-I	1989	80	500	Single/Solid	Indigenous	O	The Hatf missile was developed to counter the Prithvi missile. It was basically designed as an offensive weapon to knock off Indian concentrations. In the defensive mode, it could be used in dual roles to destroy Indian bridgeheads in Pakistani territory. Its chief use could be said to be along Pakistan's borders with India, both inside and outside.
Hatf-IA	1992	100	500	Single/Solid	Indigenous	O	
Hatf-II	1989	300	500	Two/Solid	China	D	
Hatf-III	1997	600-800	500	Two/Solid	China	D	
Ghauri-I	1998	1,500	500-750	Single/Liquid	DPRK/China	T	The Ghauri series could effectively reach virtually the whole of
Ghauri-II		1999	1,500-2,300	700	Two/Liquid	DPRK/ China	

Missile	Year of testing /acquisition	Range in km	Warhead weight in kg	Propulsion stages/propellant	Origin	Status	Strategy
							India but it seems that the strategic targeting of this missile would be more towards Mumbai and Peninsular India. The Ghauri is a mobile system and could be used for counter-value-strikes.
Shaheen-I	1999	750	1,000	Two/Solid	China	T	Pakistan's answer to India's Agni-II. It has as all India coverage, but can be said to have Mumbai and Peninsular India as the main target. With its ground mobility and solid state propellant systems, it should logically form the backbone of the
Shaheen-II	2000	2,500	1,000	Two/Solid	China	T	

						Pakistani deterrent. It is also said that the Shaeen-II could give Pakistan second strike capability in the future, due to its features of survivability and mobility.

Source: Subash Kapila, "Pakistan's Ballistic Missile Arsenal," http://www.southasiaanalysis.org/papers2/paper148.html

Besides these short range, medium range and long range missiles, Pakistan is also busy in the development of a cruise missile — the Babur (Hatf-VIII) which was tested in August 2005.[7] The Babur reportedly has a range of 500 km and can carry a nuclear warhead. Pakistani officials described Babur as a "low flying, terrain hugging missile with high maneuverability, pinpoint accuracy, and have radar avoidance features."[8] It resembles the Chinese DH-10 air launched missile which is suspected to be a reverse engineered US Tomahawk cruise missile. Some analysts believe that it is a modified version of the KH-55 cruise missile of Ukrainian origin, with additional improvements in its guidance systems to improve its accuracy. The missile's exclusive characteristics were that it had the ability to penetrate anti-ballistic systems such as the Aero, Patriot and others. The development of this missile also indicated that Pakistani engineers have been in the process of development of warhead miniaturisation. Added to the above was a successful test of the Raad (Hatf-VIII) missile which is a nuclear capable air launched cruise missile (ALCM) and has range of approximately 350 km. Pakistani officials said that the Raad has "low detection probability due to stealth design and materials used in manufacturing."[9] The Raad (meaning thunder in Arabic), Hatf-VIII, appears in some ways to be a scaled down Russian KSR-2 / KS-11 / KSR-II AS-5 [North Atlantic Treaty Organisation (NATO) name is "KELT"].[10] The JF-17 fighter aircraft being acquired from China are likely to be equipped with the Raad. The accuracy of this missile is reported to be comparable to Pakistan's Babur cruise missile, which is labelled as having "pinpoint accuracy" by official Pakistani sources.

Conduct of missile tests by Pakistan regularly, besides seeking to improve and validate the design parameters of its systems, is also designed to exhibit its resolve to use them as and when required. Demonstration of its missile capabilities is part and parcel of its deterrence strategies. If one carefully observes the timing of the testing of these missiles, it is clear they have been as a response to missile tests carried out by India or as a response to some other major event occurring in the subcontinent. For instance, the test-firing of the Raad on May 8, 2008, was in response to the test of the Agni-III by India the previous day. Similarly, during the Indo-Pak standoff in 2008, Pakistan had carried out a number missile tests for demonstration purposes even when its limited inventory could have been best preserved for eventual usage when required.

Pakistan carried out the Shaheen-I missile test in January 2008 which was followed by the Ghauri missile tests in February 2008. It carried out a successful test of the Shaheen-II missile in April 2008. Prime Minister Yousaf Raza Gilani congratulated the engineers and scientists for achieving an "important

milestone in Pakistan's quest for sustaining strategic balance in South Asia."[11] After the test of the Raad missile this year, some analysts were of the view that the Raad has enabled Pakistan to achieve a greater strategic standoff capability on land and at sea.[12] Both nuclear deterrence and its delivery means are considered essential by Pakistan to neutralise India's larger conventional forces and India's movement towards acquiring missile defence capabilities. This argument is also used by Pakistan to add to both its conventional and nuclear forces despite the economic constraints in order to satisfy its eternal quest for parity with India and achieve the so-called "strategic balance" in South Asia.

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External Dependence

China and North Korea have been the most reliable partners in the development of Pakistan's missiles. China has been helping Pakistan in its missile programme since the beginning. The then Army Chief of Pakistan, Gen Aslam Beg, had stated that "China encouraged Pakistan in developing its own guidance systems for the Hatf-II missile." In 1990, there were reports that Pakistani scientists were receiving training from Chinese scientists. Later, in 1991, it was found that China has transferred components of the M-11 missiles to Pakistan. These components included mobile launchers and dummy missile frames. As a result, the US companies were not allowed to sell missile technology to China since the China Machinery Import-Export Corporation (CPMIEC) and China Great Wall Industry Corporation (CGWIC) were involved in the M-11 sale. However, it did not have any effect on China's supply programme to Pakistan as China continued assisting Pakistan in the construction of a factory to build medium range ballistic missiles (MRBMs) near Islamabad. China also provided Pakistan with gyroscopes, assessor-meters, on-board computers and other missile related equipment of the M-11 missiles. In 1994, the US intelligence community found that Chinese technicians were going to Pakistan to activate transfer of M-11 missiles. Again, in 1995, it was reported that China is sending missile parts to Pakistan. Also, the Pakistani Shaheen missile has been based on China's missiles.[13]

In April 1999, Pakistan carried out test of the Ghauri-II missile which signified a major development in Pakistan's missile arsenal. US intelligence found that the technology for the Ghauri missile did not came from China, which was Pakistan's long-term missile partner, but from a new source— North Korea. This missile was based on the North Korean No-Dong missile but has less range than the No-dong missile. It was found that North Korean assistance has provided Pakistan the option to acquire technology for long range missiles, including intercontinental ballistic missiles (ICBMs).[14] In June 1999, Indian customs officials detained a North Korean freighter allegedly bound for Malta. According to Indian sources, the ship was carrying precision machine tools which are used for the construction of the missile production facility at Fatehjung, Pakistan.

The above facts indicate that Pakistan is highly dependent on foreign assistance for development of missiles. It is quite evident that China's proliferation of missile technologies to Pakistan has been done with a view to counter India's growing power at both regional and global levels. While at the international level, China pushes for a multipolar world, at the regional level, its policies are designed for a unipolar Asia dominated by China. Without such foreign assistance, it would not have been possible for Pakistan to develop its missile programme at such a fast pace.

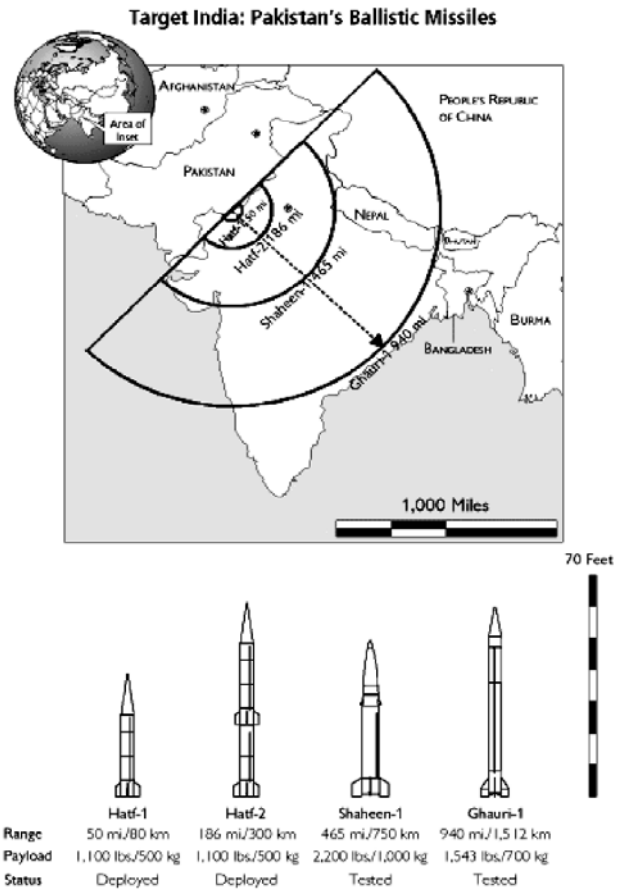
Implications of Pakistani Missile Capability for India

Pakistan's Hatf-I and Hatf-IA missiles do not pose any strategic threat to India due to their limited range. This range would be further reduced with a heavier nuclear payload. However, these missiles could be used as tactical weapons against India at a time of conflict. The Hatf-III missile, with a range of approximately 600-800 km is capable of reaching three major Indian cities, Srinagar, Chandigarh, Ahmedabad, and may even reach the outer perimeters of the Delhi urban areas. [15]

Pakistan has tested the Ghauri missile seven times since its first launch in 1998. In addition to the cities of Srinagar, Chandigarh, Delhi, Jaipur and Ahmedabad, it could reach cities like Mumbai, Pune, Nagpur, Bhopal and Lucknow. However, the problem is that the Ghauri is a liquid fuel missile carrying nitric acid and kerosene as oxidizer and fuel. Therefore, its mobile launcher has to be accompanied by separate tankers carrying nitric acid and kerosene. This makes it difficult to handle. The fuelling operation could also take one to two hours during which this missile could be vulnerable. Several reports also indicate that its actual performance may be slightly lower than estimated. It has also been reported that the Ghauri missile lacks a terminal guidance and reentry vehicle due

to which its range is likely to be limited. On the other hand, the Shaheen missile is a solid fuel missile and is based on proven Chinese technologies. It could hit important Indian cities like Mumbai and Delhi. The Shaheen-II could hit all the Indian cities in an arc reaching up to Hyderabad. However, the Shaheen-II is in the process of development. In addition to this, Pakistan's cruise missiles are important to secure deterrence against India.[16] Cruise missiles have been developed by Pakistan as an answer to India's ballistic missile defence (BMD) programme as BMD is unable to detect cruise missile launch. Fig 1 below gives an idea of the present and future ranges of Pakistani missiles:

Fig 1: Pakistan Missile Ranges and Implications for India



Source: James Phillips, Jack Spencer, Dexter, Robert Dillon "Responding to Indo-Pakistan conflict (2002)", http://www.heritage.org/research/asiaandthepacific/bg1562.cfm

India Ballistic Missile Defence Programme and Pakistani Response

In order to protect its territories, India began to look forward for the development and deployment of BMD. India has seen growing missile connections between China and Pakistan and further proliferation of nuclear and missile technologies by Pakistan. This was manifested by the AQ Khan network of nuclear proliferation. In addition, India is also concerned with the policy of Pakistan's first use doctrine. Both countries were on the brink of war during the Kargil crisis of 1999 and after the attack on the Parliament in India in 2001 which led to the launch of Operation Parakaram. In order to protect its forces, India sees development and deployment of BMD as a viable option. India's plans for acquisition of limited missile defence included looking at the Israeli Arrow missiles and associated systems like the Phalcon airborne early warning (AEW) system, Russian S-300 PMU and S-300 V air systems. India has also embarked on the path of developing indigenous missile defence systems like the Akash, Prithvi air defence system (PAD) and advanced air defence (AAD). India successfully conducted BMD tests in December 2007 and earlier in 2006 and again plans to conduct BMD tests in November 2008.

On December 6, 2007, when the Defence Research and Development Organisation's (DRDO's) interceptor missile called AAD-02 scored a direct hit on an incoming modified Prithvi missile, it propelled India into a select group of three countries with the ability to intercept ballistic missiles. The countries that already have this capability are the United States, Russia and Israel. According to the chief controller, DRDO R&D (Missiles and Strategic Systems), the modified Prithvi missile that played the role of attacker "mimicked" the trajectory of M-9 and M-11 ballistic missiles, "which are with our adversaries". The achievement of a direct hit against a high-speed target demonstrated the capability of the AAD missile system to intercept targets up to a range of 2,000 km. It also signified the development of complex guidance, control, navigation and propulsion systems; radars, seekers, computer, command, control and communication systems; robust communication networking and high-end software development.

The successful interception was an indication that India has taken the first few decisive steps forward on the road to acquiring limited missile defence capabilities. The interception in the endo-atmosphere was carried out as part of the DRDO's quest to build a two-tiered ballistic missile defence shield. Earlier, in November 2006, India's interceptor missile called PAD intercepted an incoming Prithvi-II missile at an altitude of 50 km. That test was also successfully concluded with a direct hit.

However, many Western experts believe that development of BMD will destabilise the whole situation in South Asia. Accoring to Gregory Koblentz:

> India's acquisition of an ATBM could destabilise [the] nuclear balance by depriving Pakistan of an assured strike capability. Pakistani leaders may fear that during a crisis they would be vulnerable to a disarming first strike by India, which would then rely on its missile defences to intercept any Pakistani missiles not destroyed on the ground.... Islamabad may also worry that India's defensive systems would be able to neutralise a nuclear strike by Pakistan, thus, allowing India to engage in a conventional war without fear of nuclear retaliation from Pakistan. Given the large imbalances of conventional forces between India and Pakistan, the outcome of such a conflict is not really in doubt. [17]

Similar concerns are echoed by Pakistan. Some of the reasons advanced by Pakistani analysts for their objections to India's limited missile defence programme programme are as follows:

(a) Pakistan believes that it may not be able to carry out first strike against India because of BMD. Seen from the perspective of mutual assured destruction (MAD), Indian missile defence will create problems of vulnerability and credibility regarding Pakistan's nuclear deterrent. Pakistan will lose first strike options against India because its missiles would be detected and intercepted by the BMD system. India's no first use doctrine is declaratory and Pakistan cannot place reliance on the same in the same way as India could not trust China's no first use doctrine. Even if India does not carry out first strike against Pakistan, it will definitely engage Pakistan in conventional warfare where India enjoys a clear-cut advantage.[18]

(b) Command and control (C2) systems are an important component of modern warfare. India's command and control structure is not very robust and there could be problem in operationalising C2 with the decision-making as well as in networking with the Indian military during crisis. An effective BMD system will require integration with the C2 structure. As a result, India may improve its C2 structure so that its BMD systems will remain viable. This will give India an edge over Pakistan.[19]

(c) The development of BMD will bring better technology to India which will help it to improve its missile technologies. These improved missiles will definitely be an area of concern for Pakistan.[20]

(d) In the process of development of BMD, India will move closer to the US and Israel (which is again a US ally) which will give India an edge over Pakistan.

> India will gain a lot from its friendship with the US for both its economy and military. It will also give India a greater voice in international affairs which Pakistan is not ready to accept.

As a result, Pakistan views India's BMD programme with concern. Pakistan's Foreign Secretary Inamul Haq, in the UN Conference of Disarmament on 2001 had observed that "creation of a shield would cause others to improve their lances which would heighten tensions between major powers, jeopardise the global strategic balance and turn back the disarmament clock."[21] Such official statements clearly indicate that Pakistan is opposed to the BMD programmes of India and will take necessary measures to strengthen its deterrence. This may include the following.

Change in Pakistan's Deterrence Posture

Pakistan can respond by bringing change in its "minimal deterrence posture" to "limited deterrence posture." Minimal deterrence involves the ability to respond to a nuclear attack with a minimal nuclear counter-strike. In contrast to MAD, the counter-strike would not have the ability to destroy the attacker, but rather is intended to severely damage the attacker in order to deter an attack. After the 1998 nuclear tests, Pakistan's Ambassador to the UN Munir Akram stated at the Conference on Disarmament that Pakistan had established a deterrent relationship with India but that the level would be determined in accordance with any escalatory steps taken by India. Therefore, the concept of minimal deterrence will be revised keeping in view India's nuclear capability and the presence of BMD. Pakistan relies heavily on its nuclear weapons capability and the effectiveness of its nuclear deterrent as a hedge against a conventionally superior India. Therefore, from Pakistan's point of view, maintaining the credibility of its nuclear deterrence is imperative. India's pursuit of missile defences threatens to disturb Pakistan's deterrence equation. Limited deterrence seeks a capability to deter conventional, theatre, and strategic nuclear war and to control escalation in the event of a nuclear confrontation. Under this doctrine, Pakistan would need to target nuclear forces in addition to cities, which would require increased accuracy and expanded deployments. However, though such a deterrence posture will be difficult for Pakistan to maintain due to technological and budgetary constraints, its possibility cannot be ruled out. Pakistan may seek to increase the operational Shaheen-I and Shaheen-II and would concentrate on building more cruise missiles like the Babur. It needs to be remembered that India's BMD system has very low chances

in dealing with Pakistan's Shaheen missiles. The speed of the Shaheen-I and its potential to manoeuvre as it reenters the earth's atmosphere will make it extremely unlikely that even the much improved Patriot PAC-III interceptor or equivalent indigenous interceptor would be able to intercept the target with a very high degree of probability. Also, Pakistan is likely to invest more in cruise missiles like the Babur as missile defences may not be able to detect low flying cruise missiles. A great deal of Pakistani missiles could come up with the help of China. Even Pakistan's strategic analysts say that Pakistan will be compelled to respond to Indian ambitions by increasing military cooperation with China and keeping its nuclear option open as the last resort in war against India.

Pakistan can respond by bringing change in its 'minimal deterrence posture' to 'limited deterrence posture.' Minimal deterrence involves the ability to respond to a nuclear attack with a minimal nuclear counter-strike.

As mentioned above, both India and Pakistan have adopted a recessed deterrence posture. It means that warheads are stored separately from the delivery systems and as disassembled components. Pakistan is likely to change this posture in the case of India's decision to deploy missile defence systems. In order to ensure its ability to overwhelm missile defences by a retaliatory strike, Pakistan might shift to a more sensitive alert posture with warheads increasingly mated to their delivery systems, thereby, increasing the risk of nuclear accidents. Such a condition will lead Pakistan to adopt highly destabilising and accident-prone strategies like "launch on warning" or "launch under attack." Given the extremely short missile flight time of 3-11 minutes between India and Pakistan and the conflict-prone history of South Asia, it could give rise to an extremely dangerous and unstable situation.

Playing the Numbers Game

This includes increasing the nuclear weapons. Pakistan might opt to increase the quantity and quality of its missiles, whether by developing missiles indigenously or by acquiring them from North Korea and China. Pakistan may try to increase the numbers of the Shaheen-I and Shaheen-II, try to develop the multiple independent reentry vehicle (MIRV) option as BMD could deal only with one warhead. MIRV missiles could carry several targets and could easily defeat BMD systems. Another option will be to increase development of cruise missiles as they are low flying missiles and cannot be detected by radar.[22]

Mobility

Another way is to increase the mobility option to enhance survivability (in the case of preemptive strikes) so as to protect Pakistani missiles from India's preemptive strikes. This could be done through extensive dispersals, using mobile launchers, using different delivery systems and planning simultaneous launches in war gaming.[23]

This shows that India's acquisition of BMD will increase the risk of accidental attacks, preemptive strikes, and result in an offensive-defensive arms race. However, India has been forced to consider the BMD option due to Pakistan's nexus with China and its history of proliferation. On the other hand, India has been facing some problems in its missile programme and it is now said that Pakistan's missile capability is much better than that of India. The accuracy of the guidance systems in Pakistan's nuclear arsenal is believed to be far superior to India's due to China's constant help to Pakistan. According to the US Defence Department Document 2005, which is unclassified, India has no nuclear-capable missiles and fewer aircraft capable of delivering a nuclear payload than Pakistan does. India has twice tested a new intermediate-range missile, the Agni, which may eventually provide the basis of a nuclear missile force. However, current US analysis suggests the Agni will not be fielded with nuclear warheads for another 10 years. Additionally, India appears to only have begun work on missile warhead design and on the miniaturisation of weapons — two critical hurdles to the actual use of weapons.

A US official stated that Pakistani air and missile delivery systems are now believed to be "fully capable of a nuclear exchange if something happens."[25] Other officials noted that the Pakistan Air Force's US F-16s and its French Mirage fighter-bombers are superior at penetrating enemy air space than India's Soviet-designed MiGs and Sukhois.

Most importantly, Pakistan is now thought to possess about 30 nuclear-capable missiles: the Chinese M-11 short-range missile and its Pakistani variant, the Tarmuk, as well as the North Korean No-dong intermediate-range missile (known locally as the Ghauri).[25] These latest developments have made Pakistan more capable than India. This is the reason why India is looking forward to development of BMD.

Conclusion

Pakistan's eternal ambition to seek strategic parity with India by developing its nuclear weapons and honing its delivery means has found expression in improving its missile arsenal both quantitatively and qualitatively. China's

strategy revolves around minimising any strategic advantage that India may have gained by going nuclear through its proliferation of nuclear and missile technologies to Pakistan. Pakistan's proliferation activities, continuing instability and growing terrorist activities are of concern not only for India but for the entire international community. Confidence-building measures (CBMs) have been introduced between India and Pakistan under which both countries have agreed to provide pre-notification about their missile tests. However, this process has failed to build mutual confidence; while India continues to view the growing arsenal of Pakistani missiles with consternation, Pakistan views India's BMD as limiting or neutralising its nuclear deterrence. Pakistan's propensity to pursue low intensity conflict with India under the shadow of nuclear weapons is another reason which propels India towards limiting Pakistan's nuclear options. Pakistan has also failed to appreciate that in this offensive-defensive arms race, it is the economically weaker power that ends up on the losing side. India's motivations in this regard are not only propelled by Pakistan's strategic behaviour but also by China's aggressive policies.

Notes

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