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# HATF-IX/ NASR - PAKISTAN'S TACTICAL NUCLEAR WEAPON: IMPLICATIONS FOR INDO-PAK DETERRENCE

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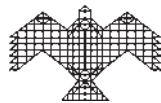
**NATIONAL INSTITUTE OF ADVANCED STUDIES**

Bangalore, India



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IMPLICATIONS FOR INDO-PAK DETERRENCE**

**Rajaram Nagappa  
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# EXECUTIVE SUMMARY

On April 19, 2011 Pakistan conducted the first test flight of Hatf-IX (NASR) missile. The Pakistani Inter-Services Public Relations (ISPR) described the missile as a 'Short Range Surface to Surface Ballistic Missile'. Till date there have been three tests of the missile system on April 19, 2011, May 29, 2012 and February 11, 2013. After each of the flight tests, the ISPR put out a largely identical press statement which stressed on the point that the "missile has been developed to add deterrence value to Pakistan's Strategic Weapons Development programme at shorter ranges." Further the press release went on to state that the 60km NASR "carries a nuclear warhead of appropriate yield with high accuracy, shoot and scoot attributes."

Following the Pakistani tests and claims of NASR being a nuclear capable missile, there has been a lot of analysis pointing to the dangers it poses for Indo-Pak deterrence. However, despite the large amount of literature which has come out following the NASR test in April 2011, not much attention has been directed at carrying out a holistic assessment of the tactical nuclear weapons issue. It is this crucial gap that that this report seeks to address.

The NASR poses important challenges for nuclear stability between India and Pakistan. However, in order to understand the drivers and Pakistan's thinking behind NASR, it is crucial to get a handle on the countries' thinking about nuclear deterrence. The nuclear doctrines and policy statements by both countries as well as

the 1999 Kargil conflict and the 2001-02 border mobilisation provides insights into Islamabad and New Delhi's thinking about nuclear weapons and deterrence.

In the absence of a formal nuclear doctrine enunciated by Pakistan, the outlines of one can be inferred by the statements of important decision-makers. The main characteristics of Pakistan's nuclear doctrine and weapons are the following. Firstly, they are primarily directed towards India; second, it espouses a policy of nuclear first-use; thirdly, it views its nuclear weapons as deterring all forms of external aggression including any conventional military offensive by India.

India on the other hand views nuclear weapons as political weapons whose sole aim is to deter any use of nuclear weapons against India by an adversary. India espouses a no-first use policy; pursues a credible minimum deterrent and has adopted a policy of massive response in case of a nuclear strike against India or its forces anywhere.

The overt nuclearisation of the Indo-Pak relationship with the 1998 nuclear tests led to a belief in Islamabad that its nuclear deterrent provided it with a cover for a conventional conflict. This was in essence the thought process behind Kargil. However, the strong Indian response to Kargil, points to the fact that India would respond - despite nuclear weapons - with military force in case its territory was occupied. At the same time, it is also important to take

note of the fact that despite the option being on the table, India decided against expanding the Kargil conflict horizontally. However it is important to note that New Delhi did not rule out such a possibility.

The December 2001 attack on the Indian Parliament by Pak-supported terror groups like Jaish-e-Mohammad (JeM) and Lashkar-e-Taiba (LeT) led to the largest Indian military mobilisation since the 1971 Indo-Pak war. This was followed by a border stand-off by Indian and Pakistani armies which lasted for almost two years. The terror attack was the result of Pakistan's belief that given its nuclear deterrent it could carry on its support of terrorist groups in their strikes against India. India in response chose a policy of compellence in order to force Pakistan to change its policy of supporting such groups on the belief that its nuclear deterrence would deter India from responding conventionally. Despite criticisms about what India actually achieved out of Operation *Parakram*, it is crucial to note the international pressure and financial burden the mobilisation imposed on Pakistan. India was thus sending a signal to Pakistan that continuing with its policy would entail costs.

Thus, Indian responses during both the 1999 Kargil conflict and the 2001-02 crisis can be seen as New Delhi's attempt to test Pakistan's nuclear threshold. The two crises provide valuable insight into the different understanding of nuclear deterrence prevalent in both countries which holds much value for the currently unfolding situation with the introduction of NASR.

For Pakistan, not much changed with the overt nuclearisation of the sub-continent. For Islamabad, India's conventional military strength coupled with its lack of strategic depth emanating from its own smaller physical size

continue to be a major concern. These twin factors were very important in its decision making calculus and in fashioning its view of nuclear weapons and deterrence. It is important to note that Pakistan went ahead with Kargil despite both countries having gone nuclear in May 1998. This reinforces the argument that Islamabad views its nuclear deterrent as a counter to its conventional military asymmetry vis-a-vis India; thereby providing Islamabad with the space to carry out Kargil type operations with the threat of escalation of the conflict spectrum to the nuclear realm.

However, India's reactions in both the situations is important to take note of. Indian response to Pakistani incursions in Kargil points to the fact that - despite the nuclear backdrop - India will act if its territory was occupied. Similarly, Indian response to the 2001 terrorist attacks also points to the likelihood that there is an Indian threshold of suffering when it comes to terror attacks by Pak-supported groups. Clearly, the 2001 attacks on the Parliament crossed that threshold. Thus despite deciding not to cross into Pakistan, India does have options to make life difficult and costly for the Pakistani state if it decides not to do a rethink on its current policy of supporting terrorist groups in carrying out attacks against Pakistan.

Learning from the 1999 Kargil conflict and the 2001-02 crisis, the Indian Army unveiled its new doctrine in April 2004. The doctrine was popularly termed as 'Cold Start' given its attempt to reduce the mobilization times. It was seen as indicative of India's willingness to modify its traditionally defensive orientation to conflicts/wars and undertake a more pro-active and nimbler stance by launching limited wars in an NBC environment. The doctrine also sought to address the issue of the lack of an element of

surprise during Operation *Parakram*.

Pakistan has been concerned about India's new military doctrine since it took away Pakistan's rationale of issuing the threat of the conventional war escalating into a nuclear war. As India was no longer fighting a conventional all-out war, it arguably would be fighting below Pakistan's nuclear 'red-lines'. This appears to have unnerved Pakistan to a great extent and they felt it necessary to restore the earlier equation by lowering the nuclear threshold. The short range Tactical Nuclear Weapon NASR was the resulting brainwave. Through NASR, Pakistan is seen to be exploring the space for a flexible response which falls between a massive response and doing nothing.

The NASR warhead section has been estimated to have a cylindrical section which is 361 mm in diameter and 940 mm long with a conical portion which is 660 mm long. Thus, the important question is whether (a) Pakistan has a miniaturized weapon warhead which will fit into this dimension, (b) whether it has been tested and (c) in the absence of tests, how reliable is the weapon system. Most importantly, in the absence of demonstrated reliability, how confident will Pakistan be in fielding it?

In May 1998, Pakistan had tested only Highly Enriched Uranium (HEU) based devices. There is wide discrepancy between the Pakistani claims of the weapon yield and the international estimates. Even if we accept the AQ Khan statement on tactical weapons, we are not wiser on its size; the smallest ballistic missile tested, when AQ Khan made the statement was the Hatf-1 which was 560 mm in diameter and had a range of 80 km. If a weapon system had been designed for Hatf-1 as claimed by Khan, it would be too large to fit into the envelope available with NASR.

Further miniaturization to fit into the NASR class of missiles can probably come with a Plutonium based linear implosion device. However, such a device requires larger quantity - almost double - of plutonium as opposed to the requirement in spherical compression. A Pakistani design of such a device can be expected to weigh at least 100 kg. Pakistan can at best work on the explosive + detonator combination with surrogate material, which is not the same as testing with the actual material. In the end, what Pakistan will have is an untested device.

It is difficult to assess Pakistan's weapon priorities and hence the fissile material production strategy. While Pakistan's weapons programme is primarily based on enriched uranium, the setting up of the Khushab series of reactors indicates that Pakistan is seriously considering the Plutonium option. Therefore the issue is one of Uranium availability especially as Pakistan's own reserves are limited and of poor ore concentration. As a non-member state of the NPT regime, it cannot import uranium for strategic purposes. Pakistan will have to do a major balancing act between the HEU and Plutonium production-maybe even freeze the production of HEU.

Will Pakistan consider its tested HEU weapons in stock as adequate for its security or will it consider it necessary to diversify its stockpile? Another important question to consider is whether Pakistan will divert all or part of its uranium reserves for production of an untested Plutonium based weapon. Even here will Islamabad lay stress on Plutonium weapons for use with its cruise missiles like Babur and Ra'ad or will it deploy them on NASR despite its rather limited damage potential against tanks and armoured personnel vehicles.

Based on the above observations, the following points emerge:

- With NASR, Pakistan in essence has fallen back on its time-tested option of threatening to use its nuclear weapons in an attempt to involve the international community and thereby counter India's conventional military asymmetry.
  - Pakistan's thinking behind employing NASR could be a search by its decision-makers for a flexible response; something between massive (suicidal) response, engaging in conventional battle, and doing nothing. NASR, as viewed in Pakistan, fits in with the desire for graded punitive retaliatory option.
  - The added danger NASR poses is the possibility of pre-delegation of the weapon to battlefield commanders in case of a conflict. Pre-delegation of a nuclear weapon poses several challenges as seen from the American and Soviet Cold War experience. Pre-delegation of nuclear weapons increases the chances of both inadvertent and unauthorized use. In addition, due to weaker command and control given the fact that the weapons might be used in a battlefield scenario; it also raises the dangers of the actual weapon system falling into hands of the advancing adversary (Indian forces) as well as *jehadi* groups with or without insider help.
  - NASR signifies a shift in Pakistan's nuclear strategy from a 'first-use' to one of 'first-strike.' Given that Pakistan would loathe to give up its low-cost, low-risk and high benefit strategy of supporting groups carrying out terror strikes against India, NASR is a Pakistani play crafted to deny India the space to respond to such terror strikes by threatening to lower its nuclear threshold.
  - Pakistan's 'graded retaliatory option' will be in direct conflict with India's nuclear doctrine which does not differentiate between a tactical and a strategic nuclear weapon strike.
  - As NASR and its capability is a claim - a claim not substantiated by demonstrated test, India has chosen to ignore it. India can afford to do so as it has its own (proven) ability to deploy a sub-kiloton if it so desires.
  - The Indian nuclear doctrine does not distinguish between tactical and strategic nuclear weapons or such use. India continues to adopt a no-first use (NFU) policy and its nuclear doctrine clearly assures 'massive retaliation inflicting unacceptable damage' against 'nuclear attack on Indian territory or on Indian forces *anywhere.*' (emphasis added by authors)
- Thus, Pakistan's gambit of using NASR to signal a lowering of its nuclear threshold to counter any conventional military operation by India is likely to pose challenges for robustness of nuclear deterrence between Pakistan and India. An important question to ponder over and one that holds some importance for nuclear stability in the Indian sub-continent is whether NASR is leading Pakistan into a 'commitment trap.' It would be wise to guard against a situation where Pakistan would be forced to follow through just because of its past assertions.
- The study shows that a weapon system like NASR has more disadvantages than advantages from all considerations ranging from damage potential to impact on deterrence stability.

# HATF-IX/ NASR - PAKISTAN'S TACTICAL NUCLEAR WEAPON: IMPLICATIONS FOR INDO-PAK DETERRENCE

## INTRODUCTION

On April 19, 2011 Pakistan conducted the first test flight of Hatf-IX (NASR) missile. The Pakistani Inter-Services Public Relations (ISPR) described the missile as a 'Short Range Surface to Surface Ballistic Missile'. Till date there have been three tests of the missile system on April 19, 2011, May 29, 2012 and February 11, 2013. After each of the flight tests, the ISPR put out a largely identical press statement which stressed on the point that the "missile has been developed to add deterrence value to Pakistan's Strategic Weapons Development programme at shorter ranges." Further the press release went on to state that the 60km NASR "carries a nuclear warhead of appropriate yield with high accuracy, shoot and scoot attributes."<sup>1</sup>

Following the Pakistani tests and claims of NASR being a nuclear capable missile, there has been a lot of analysis pointing to the dangers it poses for Indo-Pak deterrence. However, despite the large amount of literature which has come out following the NASR test in April 2011, not much attention has been directed at carrying out a holistic assessment of the tactical nuclear weapons issue. It is this crucial gap that that this report seeks to address.

To this end, the report will begin with a

brief analysis of the definitional issues which plague any attempt at categorising tactical nuclear weapons. This section will attempt to point out that any categorisation on the basis of yield, launch location, range is largely cosmetic especially when the most important criterion is how nuclear weapons are employed. Such a decision would no doubt be influenced by the adversary's forces and capabilities and one's impression of what would cause maximum 'pain' to one's adversary. Also, any such assumption is largely speculative because of the lack of access to information about how these weapons are planned to be employed, given that they form part of strategic war plans and are among the most closely guarded secrets of a country.

Also, important to study and hopefully learn from are the historical understanding of deterrence both prior to advent of nuclear weapons and during the Cold War when most of one's focus was on nuclear weapons and deterrence. Given the context of the study, focus will also be on how nuclear deterrence has panned out and understood by India and Pakistan. The case of the 1999 Kargil conflict and the 2001-02 border mobilisation will be used to glean a better understanding of what nuclear deterrence means in both countries

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<sup>1</sup> Inter Services Public Relations, "Press Release," No PR94/2011-ISPR, April 19, 2011, available at [http://www.ispr.gov.pk/front/main.asp?o=t-press\\_release&id=1721](http://www.ispr.gov.pk/front/main.asp?o=t-press_release&id=1721); Inter Services Public Relations, "Press Release," No PR130/2012-ISPR, May 29, 2012, available at [http://www.ispr.gov.pk/front/main.asp?o=t-press\\_release&id=2075](http://www.ispr.gov.pk/front/main.asp?o=t-press_release&id=2075); Inter Services Public Relations, "Press Release," No PR17/2013-ISPR, February 11, 2013, available at [http://www.ispr.gov.pk/front/main.asp?o=t-press\\_release&date=2013/2/11](http://www.ispr.gov.pk/front/main.asp?o=t-press_release&date=2013/2/11)

and how their varying understandings would impinge on the impact of NASR on nuclear stability in the Indian sub-continent.

It is also important to point out that from the very first test of the NASR by Pakistan in April 2011, there have been doubts about Pakistan's capability to field such a device. This report therefore, using openly available images, carries out a sizing of the NASR thereby estimating the envelope available for fitting in a nuclear warhead. It then delves into the challenges in developing a miniaturised warhead to fit into these dimensions. Also important in this calculus is the important aspect of Islamabad's stockpile management and weapon priorities especially owing to the fact that it has limited natural uranium deposits of rather poor concentration.

Given that Pakistan is claiming NASR to be a battlefield nuclear device, Islamabad is threatening to use the weapon system to deter any conventional military assault by India in response to a sub-conventional (terrorist) attack against India by Pakistan-supported terrorist groups. In case one takes Pakistan's claim at face value, it would translate into possible modifications in Pakistan's existing nuclear command and control structure. Thus, the report details the existing nuclear command and control mechanism and the likely changes and dangers therein due to the possibility that NASR would be pre-delegated to the battlefield commanders. In the 'fog of war' this could lead to problems for the robustness of deterrence and increase the possibility of inadvertent use of a nuclear weapon as well as such a weapon falling into the hands of terrorists or even the enemy forces.

What will be the impact that NASR will have on the robustness of nuclear deterrence between India and Pakistan? This is especially

important given the doubts about whether the missile is nuclear capable given the warhead's untested nature. Also, it is important to note the fact that doctrinally, the space that Pakistan is seeking to achieve - between massive retaliation and doing nothing - by way of NASR, just does not exist in light of India's nuclear doctrine. Therefore, the report points to the likelihood that rather than adding 'deterrence value' NASR ends up weakening the strength of Pakistan's nuclear deterrent by raising doubts in Pakistan's adversaries' minds about their deterrent. This ends up further complicating the deterrence matrix and posing greater challenges for stability between India and Pakistan.

## DEFINITIONAL ISSUES

One of the first issues that one grapples with when writing about tactical nuclear weapons is the 'definitional' one. What is the correct way to identify this class/category of weapons? This also involves the larger question as to whether there is any merit or whether it is useful or necessary to delineate them as a separate category of weapons in the first place. At the end of the day, what matters is whether or not nuclear weapons are used; and if they are, how would they be employed. Any categorisation of nuclear weapons is thus largely cosmetic. In the absence of a clear cut agreement on what to call these weapons, they have been given different terms which have been used to describe such weapons. Common among which are 'battlefield', 'tactical', 'sub-strategic' and 'non-strategic' nuclear weapons.

A case for separate classification for such weapons has been made on the basis of their *yield*, *range* among other such distinguishing characteristics. Such classification assumes that tactical weapons generally have smaller yields



and ranges. However, this is not necessarily true as there are cases where tactical nuclear weapons have yields which are larger as compared to strategic weapons. Similarly, it cannot be assumed that nuclear weapons which are delivered to smaller ranges have lesser yields.

A case in point is the American B-61 (Mk-61) nuclear warhead which has several versions or Mod-3,4,7,10,11 and the Mod-12 which is currently being developed.<sup>2</sup> The yields of the various Mods ranged from 300 tonnes to 400 Kt. The B-61 is the tactical weapon deployed with five NATO allies in Europe. The yield of this 'tactical' weapon is much larger when compared to several other 'strategic' weapons like the W-76 (Mk-4) warhead carried in the submarine launched ballistic missiles (SLBMs) from British and the American nuclear submarines SSBNs.<sup>3</sup> The W-76 is believed to have a yield of about 100Kt which is much lower than the 400Kt of the B-61 tactical nuclear warhead. Thus, yield is not a very prudent barometer for classifying weapons as tactical or strategic.

Another way in which such weapons are defined is 'by exclusion'. What this translates to is that all weapons which do not come under the ambit of any current arms control treaties will be termed as non-strategic or tactical nuclear weapons. This is also a problematic way to define/categorise such weapons as this would be applicable only to the US and the Russian context.

Yet another manner for differentiating between strategic and tactical weapons could be on the basis of location of *launch*. In case a weapon system when launched from one's own national territory (or submarine) is able to reach targets in the adversary's territory, it can be termed as a strategic weapon.<sup>4</sup> However, such a definition too is problematic because of the fact that despite being largely specific to US-Russian situation, it does not hold true in all cases even for these countries. For instance, American/NATO nuclear missiles launched from Europe would be able to reach targets in Russia and for all practical purposes would be perceived by Russians as being strategic weapons.<sup>5</sup>

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<sup>2</sup> The B61 Life Extension Program (LEP) and in particular the B61-12 warhead production and delivery programme have faced several time and cost overruns. Originally scheduled for delivery in the Nuclear Posture Review in 2017 has already been pushed back to 2019 or even later citing sequestration budget cuts. Also the cost of the programme has gone up from the initial US\$ 4billion to US\$ 10 billion. See Hans M. Kristensen, "B61-12: NNSA's Gold-Plated Nuclear Bomb Project," *FAS Strategic Security Blog*, July 26, 2012, available at <http://blogs.fas.org/security/2012/07/b61-12gold/> ; Hans M. Kristensen, "Additional Delays Expected in B61-12 Nuclear Bomb Schedule," February 21, 2013, *FAS Strategic Security Blog*, <http://blogs.fas.org/security/2013/02/b61-12delay/> . In comparison the B61-11 received the final go-ahead from the US Congress in July 1995 with the first B61-11 entering the stockpile January 1997. See "Nuclear Brief April 2005," The Nuclear Information Project, July 15, 2005, available at <http://www.nukestrat.com/us/afn/B61-11.htm>

<sup>3</sup> "The W76 Warhead," The Nuclear Weapon Archive, January 2007, available at <http://nuclearweaponarchive.org/Usa/Weapons/W76.html>

<sup>4</sup> A. Carnesale, P. Doty, S. Hoffman, S. Huntington, J. Nye, S. Sagan, *Living with Nuclear Weapons*, Cambridge: Harvard University Press, 1983, pg. 126 cited in Brian Alexander and Alistair Millar Eds., *Tactical Nuclear Weapons: Emergent Threats in an Evolving Security Environment*, 2003, Washington D.C: Brassey's Inc, pg. 49.

<sup>5</sup> This was pointed to the American delegation by the Soviet team at the start of the Strategic Arms Limitation Talks (SALT) talks. See, "Interview with Leslie H. Gelb," Episode No. 19, George Washington University, *National Security Archive*, February 28, 1999, available at <http://www.gwu.edu/~nsarchiv/coldwar/interviews/episode-19/gelb2.html>

Thus, attempts at arriving at such definitions and categorisation are largely cosmetic given that it is more important to see how these weapons are employed. A short range weapon will also be a strategic weapon if used in a geographical locale like the Indian sub-continent where the flight distances and therefore the flight times are fairly short. If seen in terms of yield, a lower yield weapon would fulfil the deterrent role as well as a megaton nuclear device; also it would assume a strategic role when used against say 'counterforce' rather than 'counter value' targets. Also, whether a weapon will be employed against a counterforce or a counter value target will depend on the strategic war plans of the country; something which has never been disclosed and is not likely to be disclosed by countries even in the future.

For purpose of this report, we have chosen to define tactical nuclear weapons on the basis of the following three parameters.

- Use in a limited theatre of battle: 200-300 kms;
- Range of the missile:  $\leq 100$ kms;
- Mass of the nuclear warhead such a missile system can deliver: 100-150 kgs.

Such a definition is important to put forth because, inter alia, both India and Pakistan have longer range, nuclear capable missiles. Given this reality, identifying a cut-off point distinguishing between these two weapon systems becomes important. This however does not take away the real problems one encounters

when trying to define what a tactical nuclear weapon entails. However, the fact remains that any such definition is superficial because a nuclear weapon is unlike any other weapon, in terms of the dangers it poses.

## **DETERRENCE: A BRIEF HISTORICAL SETTING**

Science fiction writer H.G. Wells predicted nuclear weapons and deterrence when he stated in his book *The World Set Free*, that the massive destructive power released by the atoms would result in world peace.<sup>6</sup>

Much of the scholarship during the Cold War emphasised the counter-value aspects of the weapon and its potential to deter an adversary by way of the threat of punishment it held forth. However, deterrence pre-dates the emergence of nuclear weapons by a fair margin. The older conception of deterrence is captured by Snyder when he talks of 'deterrence by denial' in his book *Deterrence and Defence*.

During the First World War, German planes like the Zeppelin carried out aerial bombings in the UK but consciously avoided British civilian targets. Such 'counterforce' targets included the London Docklands, military bases, fuel, ammunition and other military stores, military barracks. The German decision to restrict aerial bombings to military targets was the result of the fear that Britain could also retaliate in kind and attack German cities.<sup>7</sup> British planners during and following the Great War also discussed the possibility of delivering a 'knockout blow' which included attack on cities (counter value) targets

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<sup>6</sup> H.G. Wells, *The World Set Free*, London: Macmillan, 1914 available online at <http://www.gutenberg.org/files/1059/1059-h/1059-h.htm>

<sup>7</sup> David Payne, "The Bombing Of Britain In The Great War," December 2008, *Western Front Association*, available at <http://www.westernfrontassociation.com/component/content/article/121-aerial-warfare/876-bombing-britain-war.html> ; Martin Gilbert, *The First World War: A Complete History*, London: Henry Holt and Company, 2004.



so as to inflict such massive pain which would be extremely painful and paralysing.<sup>8</sup>

During the run-up to the Great War, an intriguing debate raged in the maritime domain, which also points to the interesting debate on deterrence in the years preceding nuclear weapons. Given that the British Navy was by far the largest and the most superior navy in the world at that point in time, there was debate among strategists and policy makers of various countries as to whether the UK should put forth an explicit guarantee against attacking sea-borne trade during conflict. However, British strategists like Julian Corbett were of the opinion that such an outright exemption took away an important tool from British forces. They opined that such attacks or the threat of such attacks helped British forces secure concessions from adversaries (deterrence by punishment) while at the same time protecting (deterrence by denial) the British Isles from attacks from the sea.<sup>9</sup>

During the Second World War something similar took place. Both the British and the Germany Air Forces avoided targeting cities. While the German bombers targeted the Royal Air Force (RAF) bases and avoided cities, the British did likewise.

Soon after the use of nuclear weapons by the US in Hiroshima and Nagasaki, Bernard Brodie writing in *The Absolute Weapon*, penned

what has since become one of the oft repeated quotes when discussing nuclear weapons and deterrence. Brodie wrote, “Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them. It can have almost no other useful purpose.”<sup>10</sup>

The above statement by Bernard Brodie in essence captures the deterrent value of the nuclear weapon especially in view of its destructive potential. Though there has been a difference of opinion as to whether – if at all – it was the nuclear explosions which led to the Japanese surrender<sup>11</sup>; there can be no disagreement on the fact that the nuclear weapon’s destructive potential dwarfed that of all weapons used in prior wars. The enormous ‘pain’ or even the threat of inflicting such ‘pain’ on an adversary laid the foundations of what Glenn Snyder described in his book *Deterrence and Defence* as ‘deterrence by punishment.’

Nuclear deterrence in the Cold War came into play with the Soviet acquisition of the nuclear weapon. The early dangers seen in the Korean War resulted in both the US and Soviet Union working towards avoiding a nuclear holocaust. However, both blocs built up an arsenal comprising of thousands of nuclear weapons. Partly, the race to build larger weapons in greater numbers was fuelled by the fear in the West, that communist countries like the

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<sup>8</sup> George P. Shultz, Sidney D. Drell and James E. Goodby, Eds. *Deterrence: Its Past and Future*, California: Stanford University Press, 2011, pg. 11.

<sup>9</sup> Julian Corbett, *Some Principles of Naval Strategy*, London: Longmans, pg. 99 cited in George P. Shultz, Sidney D. Drell and James E. Goodby, Eds. *Deterrence: Its Past and Future*, California: Stanford University Press, 2011, pp. 5-6.

<sup>10</sup> Bernard Brodie, *The Absolute Weapon*, New York: Harcourt, 1946, pg. 76.

<sup>11</sup> Ward Wilson, *Five Myths About Nuclear Weapons*, Boston, Houghton Mifflin Harcourt, 2013; Ward Wilson, “The Bomb Didn’t Beat Japan ... Stalin Did,” *Foreign Policy*, May 29, 2013, available at, [http://www.foreignpolicy.com/articles/2013/05/29/the\\_bomb\\_didnt\\_beat\\_japan\\_nuclear\\_world\\_war\\_ii?page=full](http://www.foreignpolicy.com/articles/2013/05/29/the_bomb_didnt_beat_japan_nuclear_world_war_ii?page=full)

Soviet Union and China had higher thresholds of absorbing pain and human loss which necessitated threatening them with massive nuclear strikes so as to maintain deterrence.

In subsequent years, despite serious conflicts like the 1961 Berlin Blockade and the resultant airlift; the 1962 Cuban Missile Crisis and the 1974 Yom Kippur War and the possibility of escalation which they held; nuclear Armageddon was averted. The fact that nuclear weapons were not used in these conflicts resulted in the strengthening of the belief that these weapons and their immense destructive potential contributed to stability.

As a result, theorists studying nuclear deterrence outlined a slew of theories ranging from existential deterrence to recessed deterrence to classical deterrence to structural deterrence. It is outside the scope of this report to delve in detail into each of these theories and their strengths and weaknesses. There are several scholars like Lawrence Freedman, Thomas Schelling, Glenn Snyder among others who have delved into these issues with greater detail and competence.<sup>12</sup>

Given that Pakistan is seeking to introduce nuclear weapons into the sub-continent, it would be worth the while to look back at American and Soviet experiences from that era. During the Cold War, the US and the Soviet Union possessed the largest number

of tactical nuclear weapons. At its height, the US and Russia possessed about 11,500 and 22,000 tactical nuclear weapons respectively. These numbers have reduced by several factors of magnitude to a situation where the US is believed to possess about 1,000 weapons as opposed to the Russian nuclear stockpile which currently includes somewhere between 2,000 to 8,000 tactical weapons.

However, tactical weapons posed a lot of problems that ranged from maintaining command and control over pre-delegated weapons, doctrinal to force structure for employing these weapons to deter the Warsaw Pact's conventional might.<sup>13</sup> Thus, both India and Pakistan would do well if they remember and learn from the past and thus don't make the same mistakes the Cold Warriors made.

For purposes of this report, the question that is critical is how nuclear deterrence has operated between India and Pakistan; and in this larger context, how one perceives the Pakistani short range 'nuclear-capable' missile the NASR/Hatf-IX.

## **NUCLEAR DETERRENCE: INDIA AND PAKISTAN**

The 1998 nuclear tests by India and Pakistan resulted in the overt nuclearisation of the Indo-Pak relationship. This is analysed briefly in the subsequent paragraphs beginning

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<sup>12</sup> Lawrence Freedman, *The Evolution of Nuclear Strategy*, UK: Palgrave, 2003; Lawrence Freedman, *Deterrence*, London: Polity Press, 2004; George Quester, *The Future of Nuclear Deterrence*, Lexington MA: Lexington Books, 1986; Patrick Morgan, *Deterrence Now*, Cambridge: Cambridge University Press, 2003; Glenn Snyder, *Deterrence and Defence: Towards A Theory of National Security*, Princeton: Princeton University Press, 1961; Thomas Schelling, *Arms and Influence*, New Haven: Yale University Press, 1966.

<sup>13</sup> For an excellent analysis of US and NATO experiences with Tactical Nuclear Weapons see, David Smith, "The US Experience with Tactical Nuclear Weapons: Lessons for South Asia," March 4, 2013, Washington: Stimson Center, available at [http://www.stimson.org/images/uploads/research-pdfs/David\\_Smith\\_Tactical\\_Nuclear\\_Weapons.pdf](http://www.stimson.org/images/uploads/research-pdfs/David_Smith_Tactical_Nuclear_Weapons.pdf)

with a succinct analysis of their nuclear policies and doctrines; followed up with the dynamics during the 1999 Kargil War and 2001-02 crisis involving mobilisation of their militaries along the Indo-Pak border.

India was first off the block with the release of its draft nuclear doctrine which was authored by the Indian National Security Advisory Board (NSAB) and released in August 1999 by the then National Security Advisor, Mr. Brajesh Mishra. The salient points of this document were an unqualified assurance of no-first use, pursuit of a 'credible minimum' deterrent, and the threat of punitive retaliation inflicting 'unacceptable damage' against the aggressor in case of use of nuclear weapons against India. Given the no-first use (NFU) policy, the doctrine placed emphasis on the survivability of the Indian nuclear forces thereby outlining the need to build a triad combined by building in redundancy into systems, use of mobility, dispersion and deception.<sup>14</sup>

This was followed up by widespread public debate and the release of a statement in January 2003 following a Cabinet Committee on Security (CCS) meeting which 'reviewed the progress in operationalising India's nuclear doctrine.'<sup>15</sup> Though it is not clear when the doctrine was formally adopted by the Indian government, the January 2003

statement is significant because it is the only official statement of India's nuclear doctrine and for the changes in policy it indicated therein vis-a-vis the August 1999 NSAB draft. The January 2003 press release reiterates the no-first use (NFU) policy and the pursuit and maintenance of a credible minimum deterrent. However, it qualifies the NFU (as opposed to the NSAB draft which did not have any qualifiers) by adding that India retains the right to use the nuclear "in the event of a major attack against India, or Indian forces anywhere, by biological or chemical weapons."<sup>16</sup>

The second major departure was the addition of the word 'massive' while assuring infliction of unacceptable damage in case of a nuclear attack against India. The idea of 'massive retaliation' was something which was absent in the 1999 NSAB draft doctrine which had only spoken of 'punitive' retaliation. The third change in the January 2003 statement relates to India's commitment in relation to states which did not possess nuclear weapons. The August 1999 draft doctrine stated that India "will not resort to the use or threat of use of nuclear weapons against States which do not possess nuclear weapons, or are not aligned with nuclear weapon powers." However, the January 2003 press release provides an assurance of non-use of nuclear

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<sup>14</sup> "Draft Report of National Security Advisory Board on Indian Nuclear Doctrine", Ministry of External Affairs, August 17, 1999, available at <http://www.mea.gov.in/in-focus-article.htm?18916/Draft+Report+of+National+Security+Advisory+Board+on+Indian+Nuclear+Doctrine>

<sup>15</sup> "Cabinet Committee on Security Reviews Progress in Operationalizing India's Nuclear Doctrine," Press Information Bureau, January 4, 2003, available at <http://pib.nic.in/archieve/lreleeng/lyr2003/rjan2003/04012003/r040120033.html>

<sup>16</sup> Pakistani scholars have cited the above qualifier as a reason why Pakistan cannot believe in the credibility of the Indian no-first use (NFU) declaration. See Zafar Iqbal Cheema, "Pakistan," in Hans Born, Bates Gill and Heiner Hanggi, Eds., *Governing the Bomb: Civilian Control and Democratic Accountability of Nuclear Weapons*, Oxford: SIPRI, Oxford University Press, 2010, pg 202, fn. 33.

weapons only against non-nuclear weapon states.<sup>17</sup>

Unlike India, Pakistan has never released a formal official statement outlining its nuclear doctrine. Many believe this to be the result of the fact that ambiguity provides Pakistan greater leeway. This is because Islamabad perceives itself to be at a disadvantage vis-a-vis India in terms of its physical size (lack of strategic depth) and asymmetry in conventional military strength. Pakistan fears that if it clearly spells out its thresholds, India could use it to its advantage by going up-to such a 'red line' and no further; thereby weakening Pakistan's rationale to threaten use of nuclear weapons. This might especially be the case when say New Delhi is responding to a major terror strike by Pakistan-backed terrorist groups.

However, despite never putting out a formal document outlining its nuclear doctrine, Pakistan leaders who are associated with its nuclear programme have released several important statements, authoring articles or giving media interviews. While this cannot be taken as official policy, these statements provide the broad contours while at the same time remaining ambiguous about the specifics of Islamabad's nuclear policy. Such statements though not official statements, can be taken as being indicative of official policy especially when the individuals making such statements

are known to be involved in the nuclear policy and decision-making apparatus in Islamabad.

Pakistan has many a times re-emphasised its goal of achieving a minimum credible deterrent capability. In 1999, General Pervez Musharraf stated that while Pakistan was not concerned with a mathematical ratio and proportion, Islamabad "would retain enough missile capacity to reach anywhere in India and destroy a few cities, if required."<sup>18</sup> Lt. Gen. Khalid Kidwai, head of Pakistan's SPD has outlined four salient features of Pakistan's nuclear policy. These were: first, deterrence of all forms of external aggression; second, ability to deter a counter-strike against strategic assets; third, stabilisation of strategic deterrence in South Asia; and fourth conventional and strategic deterrence methods.<sup>19</sup>

Another statement - indicative of Pakistan's nuclear policy - was made by Lt. Gen. Khalid Kidwai while interacting with an Italian based arms control organisation, Landau Network. Lt Gen Kidwai hinted at Pakistan's nuclear thresholds when he stated "Pakistani nuclear weapons will be used, only "if the very existence of Pakistan as a state is at stake." He stated that Pakistan's nuclear weapons are aimed solely at India and if deterrence fails Pakistan will use nuclear weapons if, "India attacks Pakistan and conquers a large part of its territory (space threshold); India destroys a large part either of

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<sup>17</sup> Rajesh Rajagopalan has written about the possible reasons for such changes in Indian nuclear doctrine when one compares the August 1999 NSAB draft and the January 2003 press release. Apart from criticism that the NFU pledge was not enough to deter potential threats (in light of the Parliament attacks), Rajagopalan also ponders whether the government has seriously pondered of the implications of the contradictions thrown up by the two statements. See, Rajesh Rajagopalan, "India's Nuclear Policy", in *Major Powers' Nuclear Policies and International Order in the 21st Century*, Tokyo: National Institute of Defence Studies, 2010, pp. 98-101.

<sup>18</sup> Cited in John Cherian, "The Arms Race," *Frontline*, Vol.16, Issue 9, April 24 - May 7, 1999, available at <http://www.frontline.in/static/html/fl1609/16090230.htm>

<sup>19</sup> "Pakistan's Evolution as a Nuclear Weapons State," Lt. Gen. Khalid Kidwai's, November 1, 2006, Naval Postgraduate School, Monterey, available at <http://www.nps.edu/academics/centers/ccc/news/kidwaiNov06.html>

its land or air forces (military threshold); India proceeds to the economic strangling of Pakistan (economic strangling); India pushes Pakistan into political destabilisation or creates a large scale internal subversion in Pakistan (domestic destabilisation).”<sup>20</sup>

Michael Krepon has identified ‘four main pillars’ of Pakistan’s nuclear doctrine. These are firstly, its India-specific nature; second, adoption of a credible, minimal deterrent policy; third, that the requirements of such a deterrent are dynamic and not fixed; and fourth, first-use of its nuclear deterrent given its military asymmetry versus India.<sup>21</sup>

Since the 1998 nuclear tests and the overt nuclearisation of the Indian sub-continent, Pakistan’s nuclear strategy has been to use its nuclear deterrent to counter the asymmetric advantage that India enjoys in conventional military terms. Therefore, Pakistan views and uses its nuclear weapons to deter a conventional

military onslaught by India. This is different from the Indian view which perceives nuclear weapons as political weapons, which would prevent a nuclear attack on India by its adversaries.

Elements of Pakistan’s nuclear thinking have been seen in the past too. In particular during the 1986-87 Brasstacks Crisis and during the 1990 Kashmir crisis, Pakistan employed its covert nuclear capability to signal possible escalation of the conflict in order to involve the international community, resulting in de-escalation of the conflict.<sup>22</sup> Pakistan therefore can be seen to be using its nuclear deterrent to threaten escalation of the conflict to higher levels of ‘all-out war’ and therefore prevent India from using its conventional might to its advantage. In light of Pakistan’s support for cross-border terrorism and its complicity in terror attacks against India, such a strategy is advantageous to Pakistan.<sup>23</sup>

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<sup>20</sup> Nuclear safety, nuclear stability and nuclear strategy in Pakistan, Landau Network, Italy, January 14, 2002, available at <http://www.pugwash.org/september11/pakistan-nuclear.htm>

<sup>21</sup> Michael Krepon, “Pakistan’s Nuclear Strategy and Deterrence Stability,” Washington, Stimson Center, December 10, 2012, available at [http://www.stimson.org/images/uploads/research-pdfs/Krepon\\_-\\_Pakistan\\_Nuclear\\_Strategy\\_and\\_Deterrence\\_Stability.pdf](http://www.stimson.org/images/uploads/research-pdfs/Krepon_-_Pakistan_Nuclear_Strategy_and_Deterrence_Stability.pdf)

<sup>22</sup> Paul Kapur questions the popular understanding of the Brasstacks crisis by posing the question whether it was preventive or pre-emptive in nature. See Paul Kapur, *Dangerous Deterrent*, pp. 85-91. With regard to the 1990 Kashmir Crisis, Seymour Hersh writing in *The New Yorker* states that US intervention was a result of intelligence provided by American agencies which pointed to the possibility that Pakistan was moving its missiles and moving towards assembling a nuclear weapon. See Seymour Hersh, “On the Nuclear Edge,” *The New Yorker*, March 29, 1993, pp. 56-73. However, both Paul Kapur and Bajpai et al. conclude that India was not seriously considering any hostile activity. Therefore, conclude that stating that Pakistan’s covert nuclear capability deterred India would be a leap. See, Paul Kapur, *Dangerous Deterrent: Nuclear Weapons Proliferation and Conflict in South Asia*, New Delhi: Oxford University Press, 2008, pp. 108-113. The lack of Pakistan’s nuclear deterrent having influence Indian reactions is also made by Kanti Bajpai, et al Ed. *Brasstack and Beyond: Perceptions and Management of Crisis in South Asia*, Delhi: Manohar, 1997, p.40.

<sup>23</sup> Such behaviour has been described using Cold War terminology as ‘stability-instability’ paradox. Varun Sahni and Paul Kapur provide insightful analysis of whether or not the stability-instability paradox is relevant in the Indian sub-continent. See, Varun Sahni, “The Stability-Instability Paradox: A Less than Perfect Explanation,” in E. Sridharan Ed., *The India-Pakistan Nuclear Relationship: Theories of Deterrence and International Relations*, New Delhi : Routledge, pp. 185-207; Paul Kapur, *Dangerous Deterrent*, New Delhi: Oxford, pp. 169-184; Paul Kapur, “Revisionist Ambitions, Conventional Capabilities, and Nuclear Instability: Why Nuclear South Asia is Not Like Cold War Europe,” in Scott Sagan Ed., *Inside Nuclear South Asia*, New Delhi: Cambridge University Press, pp. 184-218.

Post-1998, there have been two instances where the deterrence stability between India and Pakistan has been tested. The first occurred as a result of Pakistan's misadventure in Kargil and the second was the border mobilisation by both countries in response to the terrorist strikes on the Indian Parliament.

### ***The 1999 Kargil Conflict***

Due to its nuclear capability, Pakistan felt that it could wage a limited battle without the war escalating to the extent that it did.<sup>24</sup> This was the underlying assumption behind the Kargil incursions. The architect of Kargil, then Pakistani Army Chief Pervez Musharraf's statement to the graduating class at the Pakistan Military Academy in April 1999 buttresses the existence of a belief in Islamabad that Pakistan's nuclear deterrence has provided it with a cover for conventional war.

"Our efforts to acquire a viable defensive force both in the conventional and also, by grace of Allah, in the nuclear and missile mode are to guarantee peace and security through potent deterrence ... This, however, does not mean that conventional war has become obsolete. In fact conventional war will still remain the mode of conflict in any future conflagration with our traditional enemy."<sup>25</sup>

This goes back to the argument that Scott Sagan and other organisation theorists make; which is that organisational interests and

biases are an important factor in understanding Pakistan's nuclear behaviour. Scott Sagan states, "Any government in Islamabad would be likely to have a first-use doctrine, but the specific details of Pakistani nuclear doctrine reflect common organisational biases stemming from the central role of the professional military in making policy and the weak institutional checks and balances on its authority over nuclear matters."<sup>26</sup>

Though, there were many who agreed with the rationale underlying the gambit Musharraf was taking, it is interesting and somewhat encouraging to note that the operations were not received equally well across the Pakistani military. There seem to have been individuals who criticised the operation on the basis that it did not take into account the wider military, diplomatic and strategic ramifications of the entire operation. One such individual is Air Commodore Kaiser Tufail, who was then Pakistan Air Force director of operations.<sup>27</sup> However, it is not clear whether such a feeling was an isolated one or whether it remains more widespread within the Pakistani security forces. However, given the fact that the Pakistani Air Force was kept out of the decision making loop during Kargil and was later called on to provide support to Pakistani forces; one suspects inter-services rivalry might have contributed to the sentiments expressed by Air Commodore Tufail.

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<sup>24</sup> Interview with the then Prime Minister Nawaz Sharif, cited in Paul Kapur, *Dangerous Deterrent: Nuclear Weapons Proliferation and Conflict in South Asia*, New Delhi: Oxford University Press, 2008, pg. 120.

<sup>25</sup> Musharraf's speech cited in Scott Sagan, "Evolution of Pakistani and Indian Nuclear Doctrine," in Scott Sagan Ed. *Inside Nuclear South Asia*, New Delhi: Foundation Books, 2011, pp. 229-230.

<sup>26</sup> Scott Sagan, "Evolution of Pakistani and Indian Nuclear Doctrine," in Scott Sagan Ed. *Inside Nuclear South Asia*, New Delhi: Foundation Books, 2011, pg 220.

<sup>27</sup> Scott Sagan, "Evolution of Pakistani and Indian Nuclear Doctrine," in Scott Sagan Ed. *Inside Nuclear South Asia*, New Delhi: Foundation Books, 2011, pg 231.



Despite opinions being expressed to the contrary by Pakistani military officers, the take-away from the Kargil conflict was the fact that India would respond with military force - though it might be limited in scope - in case its territory was occupied. Though India did not expand its scope of operations horizontally and decided against opening other fronts; it is clear that the option was discussed and it had been decided for the time being to continue fighting under the unfavourable conditions and absorb the mounting casualties. However, the decision to open another front and expand the conflict remained on the table and might have been exercised in case the conflict had gotten worse for India.<sup>28</sup>

Following the Kargil conflict, the chief of Pakistan's Strategic Planning Division (SPD), Lt. Gen. Khalid Kidwai, speaking to representatives of Landau Network, an Italian arms control organisation, outlined the four red lines or thresholds of space, military, economic and domestic destabilisation.<sup>29</sup> As these have been outlined earlier, these will not be repeated again at this point. However, these thresholds do raise the question of whether the Pakistani nuclear planners have limited options of responding to nuclear threats. Probably, Pakistanis are using the NASR to indicate such an option which falls between massive and suicidal retaliation and doing nothing.

### ***The 2001-02 Crisis***

On December 13, 2001 Pakistan-backed terrorist group Jaish-e-Mohammed (JeM) and

Lashkar-e-Taiba (LeT) attacked the Indian Parliament. In response, India decided it had to compel Pakistan to change its tactic of supporting terrorist groups who carry out attacks against India based on the belief that the Pakistan's nuclear capability would deter India from carrying out conventional strikes.

To this end, Indian leaders launched the largest ever mobilisation of its forces since the 1971 War with Pakistan on December 18, 2001. Operation Parakram, as the mobilisation was termed, resulted in the massing of 500,000 Indian troops along the Line of Control (LoC) and the International border (IB) that India and Pakistan share. Between December 2001 and October 2002 when India and Pakistan finally decided to drawdown their troops from the LoC and the IB, the situation was fairly tense, reaching its possible peak in May 2002 following a major terrorist attack on an Indian Army camp at Kaluchak in Jammu.

Under international (in particular, American) pressure, Pakistan took some steps to mollify India. In January 2002, Pakistan banned the Lashkar-e-Taiba (LeT) and the Jaish-e-Mohammed (JeM) followed by the March 2002 statement by President Musharraf on national television promising that Pakistani territory would not be allowed to be used as a launching ground for terrorism attacks against India. However, Pakistan's claim that it was clamping down on the terror groups was soon blown to smithereens. On May 14, 2002 Pakistan-backed terror groups JeM and LeT attacked an Indian Army camp at Kaluchak in Jammu. The attack

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<sup>28</sup> Paul Kapur, *Dangerous Deterrent: Nuclear Weapons Proliferation and Conflict in South Asia*, New Delhi: Oxford University Press, 2008, pg. 128-30.

<sup>29</sup> Nuclear safety, nuclear stability and nuclear strategy in Pakistan, Landau Network, Italy, January 14, 2002, available at <http://www.pugwash.org/september11/pakistan-nuclear.htm>

resulted in thirty-six casualties with family members of Indian army personnel among the deceased. The Indian leadership lashed out following the attack with Indian Prime Minister Atal Behari Vajpayee - during a visit to the region - asking the Indian soldiers to be ready for a “decisive battle” against Pakistan.<sup>30</sup>

However, following American pressure, President Musharraf stated in early June 2002 that Pakistan would end infiltration ‘permanently.’ US Deputy Secretary of State, Richard Armitage who squeezed this promise out of Musharraf then visited New Delhi assuring Indian leaders that Musharraf would keep his word. The mobilisation was finally withdrawn by India and Pakistan beginning October 2002, under international pressure and following assurances by Pakistan that it would act against the terror groups.

However, despite claims by several Indian leaders to the contrary, critics term Operation Parakram as “the most ill conceived manoeuvre in Indian military history.” Former Army Chief, Shankar Roychoudhry, describes Operation Parakram as a “pointless gesture” which compromised Indian credibility greatly.<sup>31</sup> Apart from the slowing down of cross-border infiltration, and a few hollow Pakistani promises, India did not gain much by such a large military mobilisation which according to some estimates cost somewhere between US\$ 400 million to US\$ 1 billion. The Pakistani promises as India realised did not mean much as highlighted by the attack on the Kalachuk army camp even

during the military mobilisation.

Different points of view on any such major decision are in the natural course of things. Critics point out that given India’s decision not to move beyond mobilising its forces on the border, Pakistan came out of the crisis with its belief strengthened that its nuclear capability had deterred India from launching a conventional attack. However, despite the economic cost that India had to bear, it is equally important to note that because of its worse off economic condition, the mobilisation would have been dearer for Pakistan. Another lesson, India sought to convey to Pakistan was its resolve to respond to a terrorist attack. India wanted to convey a signal to Pakistan that it did not buy the Pakistani threat that a conventional crisis would get escalated to the nuclear realm. In fact, the Indian Army chief during the Kargil conflict, General VP Malik captures the Indian position well when he states, “All-out conventional war, No. Limited conventional war, Yes.”<sup>32</sup>

Thus, Indian responses during both the 1999 Kargil conflict and the 2001-02 crisis can thus be seen as New Delhi’s attempt to test Pakistan’s nuclear threshold. The two crises provide valuable insight into the different understanding of nuclear deterrence prevalent in both countries which holds much value for the currently unfolding situation with the introduction of NASR.

For Pakistan, not much changed with the overt nuclearisation of the sub-continent.

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<sup>30</sup> Sarah Left, “Indian PM calls for ‘decisive battle’ over Kashmir,” *The Guardian*, May 22, 2002, available at <http://www.guardian.co.uk/world/2002/may/22/kashmir.india>

<sup>31</sup> Praveen Swami and Gen. Roychoudhry as quoted by Kapur in Paul Kapur, *Dangerous Deterrent: Nuclear Weapons Proliferation and Conflict in South Asia*, New Delhi: Oxford University Press, 2008, pg. 136.

<sup>32</sup> Cited in Paul Kapur, *Dangerous Deterrent*, p. 137.



Islamabad continues to be worried about India's conventional military strength and its smaller physical size thereby strengthening its concern of lack of strategic depth. These twin factors were very important in its decision making calculus and in fashioning its view of nuclear weapons and deterrence. It is crucial to note the telling that Pakistan went ahead with Kargil despite both countries having gone nuclear in May 1998. This strengthens the argument that Islamabad views its nuclear deterrent as a counter to its conventional military asymmetry vis-a-vis India; thereby providing Islamabad with the space to carry out Kargil type operations as it could threaten escalation of the spectrum of conflict to the nuclear realm.

The 2001 attack by the Pakistan-supported terror groups which resulted in the largest ever military mobilisation by India and the May 2002 Kaluchak attack during the mobilisation affirmed Pakistan's understanding that its nuclear deterrent provided the space to continue with its policy of supporting terrorist groups.

However, it is important to note India's reactions in both the situations. Indian response to Pakistani incursions in Kargil points out that - despite the nuclear backdrop - India will act if its territory was occupied. Similarly, Indian response to the 2001 terrorist attacks also indicates to the likelihood that there is an Indian threshold of suffering when it comes to terror attacks by Pak-supported

groups. Clearly, the 2001 attacks on the Parliament crossed that threshold.<sup>33</sup> Thus despite deciding not to cross into Pakistan, India does have options to make life difficult and costly for the Pakistani state, if it decides not to do a rethink on its current policy of supporting terrorist groups in carrying out attacks against Pakistan.

### **INDIA UNVEILS THE 'COLD START'**

In April 2004 the Indian Army unveiled its new military doctrine which has popularly been termed as 'Cold Start' given its attempt to reduce the mobilisation time.<sup>34</sup> The new military doctrine was seen as indicative of India's willingness to modify its traditionally defensive orientation to conflicts/wars and undertake a more pro-active and nimbler stance by launching limited wars in an NBC environment. The doctrine also addressed the issue of the lack of an element of surprise during Operation Parakram which was a result of the fact that it took about three weeks for the three Indian strike corps to reach the border from their peacetime bases in the Indian hinterland.<sup>35</sup> Swiftness in mobilisation to respond to an emerging situation was one of the most important lessons India had learnt from 2001-02 crisis.

The primary objective of the doctrine is to launch a swift, conventional, limited strike against Pakistan in response to say another terrorist strike like the 2001 attack on the

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<sup>33</sup> One could debate on what this threshold is and why the 2008 Mumbai terror attacks did not qualify for a military response from India. Here it is important to understand that this debate goes to the heart of how India and Pakistan view nuclear deterrence differently. However, this is beyond the scope of this study.

<sup>34</sup> Indian Army Doctrine, October 2004, Headquarters Army Training Command - Indian Army, Shimla, available at [ids.nic.in/Indian%20Army%20Doctrine/indianarmydoctrine\\_1.doc](http://ids.nic.in/Indian%20Army%20Doctrine/indianarmydoctrine_1.doc)

<sup>35</sup> Walter C. Ladwig III, "A Cold Start for Hot Wars?: Indian Army's New Limited War Doctrine," *International Security*, Vo. 32, No. 3, Winter 2007/08, pp. 158-190.

Parliament. The crux of the doctrine and the reorganised force structure has been the necessity for swift and decisive action against Pakistan, and the need to fulfil the limited military objectives before the international community could intervene. The mobilisation and manoeuvre phases would be characterised by speed and surprise. One of the reasons for adopting the CSD is also to deny Islamabad the opportunity to involve the international community and thereby forestall Indian moves as it has been doing in the past.

The operationalisation of the doctrine entails a move away from three massive strike-corps to eight division sized 'integrated battle groups' (IBGs) which would launch "offensive operations to a shallow depth (30-40 miles), to capture a long swath of territory almost all along the international boundary" with close air and naval support within 72-96 hours.<sup>36</sup> The captured strip of land can be used as a "bargaining chip" to pressurise Pakistan to recant its support to terrorist networks. Post-initial operations, the strike corps (one or more), would exploit the achievements without crossing Pakistan's ambiguous nuclear red lines.<sup>37</sup> Largely, CSD can be considered as a "form of flexible response, a serious effort at thinking through the prerequisites of limited war under the nuclear shadow".<sup>38</sup>

## PAKISTAN'S CONCERNS ABOUT INDIA'S COLD START DOCTRINE

Pakistan has been concerned about India's new military doctrine since it was unveiled in 2004. One of the major concerns in Islamabad was the fact that the new doctrine took away Pakistan's rationale of issuing the threat of the conventional war escalating into a nuclear war. As India was no longer fighting a conventional all out war, it arguably would be fighting below Pakistan's nuclear 'red-lines'. This unnerved Pakistan to no end.

In addition to nullifying the nuclear shield Pakistan sought to use in order to counter India's asymmetric military advantage; the plans to mobilise quickly also gave Pakistan lesser time to plan and operationalise its own response. As former Director-General ISI, Lt. General Asad Durani states, during usual Indo-Pakistan military conflicts/wars leading to complete mobilisation, Pakistan forces would have almost 4-6 week to prepare for the engagement and undertake a rational "assessment of the adversary's likely war plans." However, with the launch of the CSD, Pakistan would have little time to react and operationalise their military plans to suit India's swiftness.<sup>39</sup>

Another Pakistani concern emanates from its smaller physical size and its perceived lack of strategic depth. Analysts have averred that

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<sup>36</sup> Gurmeet Kanwal, India's Cold Start Doctrine and Strategic Stability, IDSA Comment, June 1, 2010, available at [http://www.idsa.in/idsacomments/IndiasColdStartDoctrineandStrategicStability\\_gkanwal\\_010610](http://www.idsa.in/idsacomments/IndiasColdStartDoctrineandStrategicStability_gkanwal_010610); Walter C. Ladwig III, "A Cold Start for Hot Wars?: Indian Army's New Limited War Doctrine," *International Security*, 32(3), Winter 2007/08, pp. 164.

<sup>37</sup> Kanwal, India's Cold Start Doctrine and Strategic Stability.

<sup>38</sup> Shashank Joshi, India's Military Instrument: A Doctrine Stillborn, *Journal of Strategic Studies*, 2013, available at <http://dx.doi.org/10.1080/01402390.2013.766598>.

<sup>39</sup> Workshop Report, Indian Military's Cold Start Doctrine and its Implications for Strategic Stability in South Asia, 20th-22nd July 2010, available at [www.sassi.org/wp-content/uploads/2012/05/Conference-Report.pdf](http://www.sassi.org/wp-content/uploads/2012/05/Conference-Report.pdf).

under the Cold Start, India's goal would be to make shallow territorial gains, 50-80kms deep that could be used as post-conflict bargaining chips.<sup>40</sup> Owing to Pakistan's geographical makeup and limited strategic depth, major civilian and industrial centres near the Line of Control would get engulfed in the range stipulated in the doctrine. Following is the strip of area as specified a Pakistani scholar, Sania Abdullah, which remains at stake.

**Figure 1: Depiction of Pakistan's possible Red-line<sup>41</sup>**



Given that India's IBGs are likely to be provided with close air support, Pakistan is also concerned about the Indian Air Force's numerical and qualitative strength as compared to Pakistani Air Force.<sup>42</sup> Pakistani scholar Zafar Nawaz also points to the difficulty Pakistan will face given Pakistani intelligence agencies'

"limited reconnaissance assets to monitor the status of all the eight IBGs," which would be essential to counter CSD's surprise element.<sup>43</sup>

As seen from the above discussion, Pakistan sees its nuclear weapons primarily as a deterrent to a conventional military attack by India. This is opposed to Indian (and general) thinking about nuclear weapons, which are seen as political weapons and a deterrent against nuclear attack by one's adversary. Given Pakistan's fears emanating from India's 2004 military doctrine, Pakistan has sought to use to NASR to signal a further lowering of its nuclear threshold in order to prevent any limited conventional military strike by India. Pakistan is seen to be exploring the space for a flexible response which falls between a massive response and doing nothing.

However the danger is such a strategy is two-fold. First, India is equipped to fight in an NBC environment as outlined in the Indian Army's 2004 military doctrine and subsequent pronouncements. Secondly, India's nuclear doctrine, does not differentiate between a tactical and strategic nuclear weapon or such use. Indian response to any use of a nuclear weapon by Pakistan will be a retaliation which is massive and designed to inflict unacceptable damage on Pakistan. Thus, the space that Islamabad is seeking to explore by way of NASR just does not exist.

<sup>40</sup> Firdaus Ahmed, "The Calculus of 'Cold Start'," *India Together*, May 2004, available at <http://www.indiatogether.org/2004/may/fah-coldstart.htm>.

<sup>41</sup> Sania Abdullah, "Cold Start in Strategic Calculus," *IPRI Journal*, 12(1), Winter 2012, pg, 13, available at <http://ipripak.org/journal/winter2012/Article%201.pdf>.

<sup>42</sup> Abdullah, Cold Start in Strategic Calculus.

<sup>43</sup> Zafar Nawaz Jaspal, "Cold Start Assumptions: Critical Analysis", paper presented at Workshop on Indian Military's Cold Start Doctrine and its Implications for Strategic Stability in South Asia, Islamabad, 20th-22nd July 2010, available at [www.sassi.org/wp-content/uploads/2012/05/Conference-Report.pdf](http://www.sassi.org/wp-content/uploads/2012/05/Conference-Report.pdf).

## NASR/HATF-IX: A TECHNICAL ANALYSIS

The Pakistani short range surface to surface multi tube ballistic missile called Hatf-IX (NASR) has been tested thrice on April 19, 2011, May 29, 2012 and February 11, 2013<sup>44</sup> The NASR with a range of 60 km carries is claimed to carry “nuclear warheads of appropriate yield with high accuracy, shoot and scoot attributes.” The discernible difference is a two-tube launcher was employed for the first flight, whereas a 4-tube launcher was employed for the second flight. The images from the ISPR press releases are shown in Figure 2.

The carrier vehicle for the missile is said to be AR1A/A100-E multiple launch rocket system (MLRS), procured by Pakistan from China. The A100-E artillery rocket system has 10 launching tubes for 300 mm diameter rockets of nominal

length 7.3 m and nominal weight of 840 kg. It is claimed by certain sources that Pakistan procured a battalion (36 numbers) of this system from China for initial evaluation and is likely to order further numbers.<sup>45</sup> Comparison of the images (Figure 3) of the NASR carrier vehicle with A100-E does show close resemblance. As the calibre of the rockets on A100-E is 300 mm researchers have assumed the NASR diameter also to be 300 mm.

Pakistan is certainly capable of building a missile like the NASR, but the crucial question concerns Islamabad’s capability to field a miniaturised nuclear weapon system on the NASR.

## DETERMINING THE NASR’S DIMENSIONS

Images and video footage of the NASR missile emerging from the launcher tube at

**Figure 2: NASR/Hatf-IX Flight test images**



<sup>44</sup> Press Release No. PR94/2011-ISPR, Rawalpindi-April 19, 2011, [http://www.ispr.gov.pk/front/main.asp?o=t-press\\_release&date=2011/4/19](http://www.ispr.gov.pk/front/main.asp?o=t-press_release&date=2011/4/19) accessed 19 January 2013; Press Release No. PR130/2012-ISPR, Rawalpindi-May 29, 2012, [http://www.ispr.gov.pk/front/main.asp?o=t-press\\_release&date=2012/5/29](http://www.ispr.gov.pk/front/main.asp?o=t-press_release&date=2012/5/29) accessed 25 January 2013.

<sup>45</sup> “AR1A: Multiple launch rocket system,” Military Today, available at <http://www.military-today.com/artillery/ar1a.htm>.

**Figure 3: A100-E MLRS (left) and NASR MLRS (right)**



an angle of 40°–45° to the horizontal similar to Figure 2 are available. The TEL dimensions therefore hold the clue for determining the missile dimensions. The Chinese version of the Multiple Launch Rocket System (MLRS) equivalent to the Russian *Smerch* system is referred to as A-100. The Chinese modified it and sold the AR1A also referred to as the A100-E to Pakistan. The A100-E chassis with the modified launching tube system is adapted for launching the NASR missile. The obvious similarity between the two carrier vehicles can

be seen in Figure 3.<sup>46</sup>

Similarities include the number of axles, the cabin, cabin mounting steps, front bumper, rear cabin ladder/ladder location and the box just ahead of the 3<sup>rd</sup> axle. The *Smerch* carrier was fitted with MLRS for carrying/launching twelve missiles of 300 mm calibre. The Chinese A100-E system given to Pakistan featured ten missiles of 300 mm calibre. Based on this, it appears that Zahir Kazmi has concluded the NASR's diameter to be 300 mm.<sup>47</sup> What Pakistan has done is to use the A100-E TEL chassis but

**Figure 4: NASR emerging from the launch tube**



**Figure 5: NASR aft end view**



<sup>46</sup> Images taken from: “AR1A: Multiple launch rocket system,” *Military Today*, available at <http://www.military-today.com/artillery/ar1a.htm> and “Hatf IX Nasr Missile Tested by Pakistan,” *Pakistan Defence*, available at <http://www.defence.pk/forums/pakistan-strategic-forces/183325-hatf-ix-nasr-missile-tested-pakistan-6.html>.

<sup>47</sup> Zahir Kazmi, “SRBMs, Deterrence and Regional Stability South Asia: A case study of NASR and Prahar,” *Regional Studies*, 30(4), Autumn 2012, p. 73.



totally replaced the multi-launch tubes, initially with a two tube system and subsequently with a 4 tube system as shown in Figures 4 and 5. It should be possible to guess the missile dimensions using these images and the known dimensions. An examination of figures 4 and 5 indicates that:

- The missile is slender (most missiles of this class can be expected to be so) and is fin stabilised
- The launch barrel is square in shape
- The missile is loaded into the tube with the fins fitting diagonally (at 45°)
- There must be launch rails inside the tube (not visible in figure 4).
- The launch angle is close to 40°

The dimensions and other features of the AR 1A/A100-E TEL are indicated in Table 1.

**Table 1: Dimensions and other details of AR 1A/-100-E TEL<sup>48</sup>**

Crew	4
Weight	40 tons
Length	12 m
Width	3 m
Height	3 m
Engine	Diesel
Max Speed	60 km/hr
Range	650 km
Gradient	57%
Side Slope	30%
Vertical Step	0.6 m
Trench	2 m
Fording	1.1 m

The rear axle and the end of the vehicle are covered by the missile exhaust gases and hence is not visible. Therefore using the known length of the vehicle for proportionately determining the missile length is not possible. Consequently, the possibility of arriving at the dimensions using the width of the vehicle was examined. Detailed dimensions of the WS 2500 TEL<sup>49</sup> in use by the Pakistani defence services are available. The width of the trailer is 3.05 m, close enough to the 3 m width of the A100-E shown in table 1. The wheel span for the WS 2500 is known to be 2.375 m and the same span can be assumed for A100-E. A close up view of the aft portion of the missile, launcher tube and trailer is shown in Figure 6, from which some details can be gleaned.

It can be seen that the side of the tube is in line with the fender centre line and it can therefore be assumed that the twin tubes with the gap between them have a width equal to the wheel base. This information is to be supplemented with additional data to get a handle on the missile dimensions. Figure 7 is a video grab<sup>50</sup> taken from YouTube. From the image, the following information is evident:

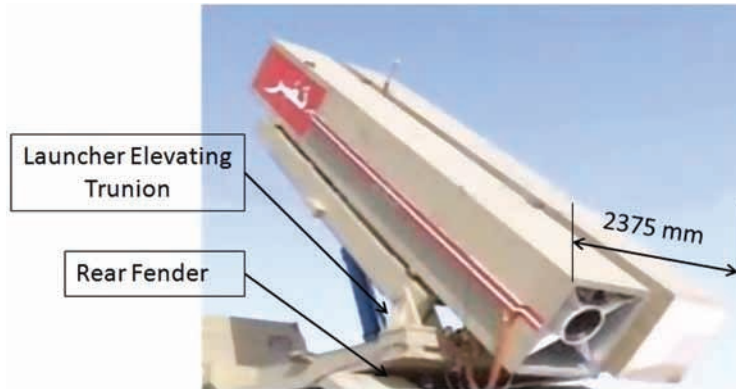
- The tube cross section is square
- The launch rail is at the top inner surface of the tube
- The missile has forward canards to aid stability
- There are two channels on the tube sides. They may either carry electrical

<sup>48</sup> The MLRS details are sourced from “A-100: Multiple launch rocket system,” Military Today, available at <http://www.military-today.com/artillery/a100.htm>.

<sup>49</sup> Technical details of WS 2500 TEL available at [http://trishulgroup.blogspot.in/2008\\_12\\_01\\_archive.html](http://trishulgroup.blogspot.in/2008_12_01_archive.html)

<sup>50</sup> Video available at “Pakistan Army Successfully Test Fires Nuclear Capable Hatf IX (NASR) - (29-05-2012)”, YouTube, available at video grab from <http://www.youtube.com/watch?v=xI2qWVN0Tsc>.

**Figure 6: NASR missile/A-100-E**



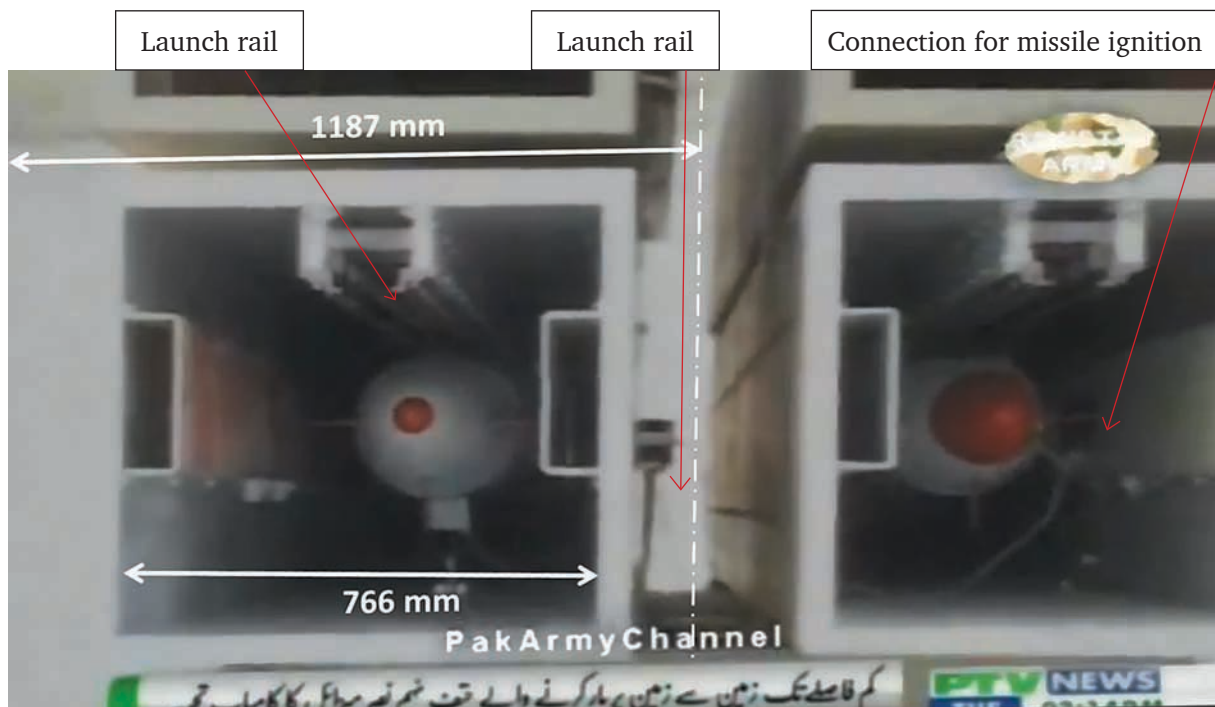
wiring or may provide additional support to the missile in the tube.

- A connector on the outside wall at the right is also visible. This is for providing the firing current for initiating the missile launch.

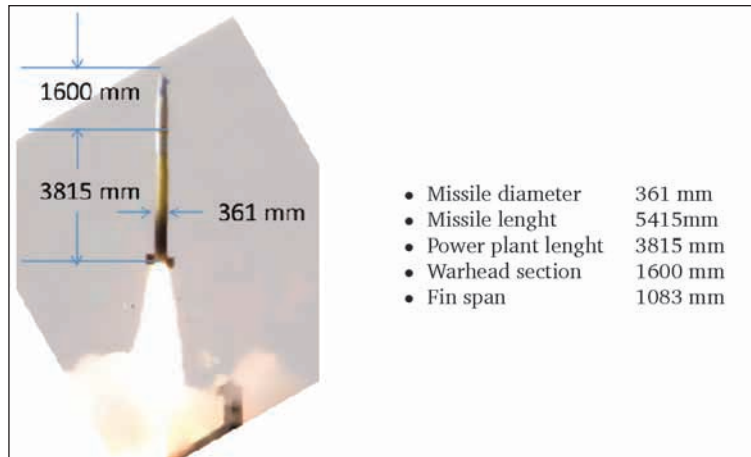
Making allowances for the width of the trunion mounting plate, for the thickness of

the side wall and the gap between the tubes, the dimension of inside of the tube is estimated as 766 mm. From figure 5, it can be seen that the missile body diameter is approximately equal to the fin semi-span, which means the diagonal of the tube section can be equally divided into three parts to represent the fins and the missile body. From this consideration, the missile

**Figure 7: View from the fore-end**



**Figure 8: NASR missile estimated dimensions**



**diameter is estimated to be 361 mm.** From figure 5, the length to diameter ratio of the missile is estimated to be 15, from which the missile **length is found to be 5416 mm.** One joint is discernible just above the 'NASR' logo and this is the connection between the missile power plant and the warhead. This **joint is located 1600 mm** from the nose tip. The finally derived dimensions of the missile are shown in figure 8.

### **Is NASR NUCLEAR CAPABLE? A TECHNICAL ANALYSIS**

A fairly well designed power plant of the dimensions shown in figure 7 can accommodate about 350 kg of composite solid propellant and can be expected to have a range in excess of 300 km with a nominal payload of 100-150 kg. The fact that the missile seems to be designed for a lower range indicates the propellant loading must be much lower, perhaps in the region of 75-100 kg. While this propellant quantity can in fact be housed in a smaller calibre motor, the

choice of a larger diameter for the power plant is obviously dictated by other considerations. The minimum achievable size of the warhead appears to be the deciding factor for the diameter of the missile.

The question is to see, if a nuclear warhead can be fitted into the available dimension of 350 mm diameter and 1600 mm length. A survey of tactical nuclear weapons fielded by the United States<sup>51</sup> showed that low yield weapons can indeed be designed to fit into these dimensions as shown in Table 2 below:

The NASR warhead section has been estimated to have a cylindrical section which is 940 mm long and a conical portion which is 660 mm long. It can be seen that with the exception of W-55 and W-79, all the warheads can fit within the NASR warhead dimensions. The questions that need to be pondered over are (a) has Pakistan miniaturised a weapon system to this level, (b) has it been tested and (c) in the absence of tests, how reliable is the weapon system. Most importantly, in the absence of

<sup>51</sup> Thomas Cochran, William Arkin and Milton Hoenig, *Nuclear Weapons Databook, Volume 1: US Nuclear Forces and Capabilities*, Natural Resources Defense Council Inc., 1984 (Data compiled and collated by Dr. Arun Vishwanathan, Assistant Professor, National Institute of Advanced Studies, Bangalore).



**Table 2: US low yield weapons**

Weapon	Type	Width, mm	Length, mm	Weight, kg	Yield
W-44	ASW warhead	349.25	642.62	77	10 kT
W-45	Warhead	292.1	685.8	68	500 T; 1, 5, 8, 10, 15 kT
				158	
W-48	Artillery Shell	155	845.82	53-58	72 T
W-54	Warhead	273.05	398.78	22-23	250 T
Mk-54	Warhead	273.05	447.04	22-24	10, 20 T
W-55	ASW	330.2	1000.76	213	Mid Kiloton Range
W-60	Warhead	330.2	508	52-68	Very low
W-74	Artillery Shell	155	NA		2 yields (both > 100 T)
W-75	Artillery Shell	203	NA		> 100 T
W-79	Artillery Shell	203.2	1117.6	90	Variable - 100 T to 1.1 kT (Mod 0), 0.8 Kt (Mod 1)
W-80-0	Warhead	299.72	797.56	131	Variable: 5 kT and 170-200 kT
W-80-1	Warhead	299.72	797.56	131	Variable: 5 kT and 150-170 kT
W-81	Warhead	342.9			2 - 4 kT
W-82	Artillery Shell	155	863.6	43	<2 kT
W-84	Warhead	330.2	863.6	175	Variable: 0.2 - 150 kT
W-85	Warhead	317.5	1066.8	399	Variable: 5 - 80 kT

demonstrated reliability, how confident will Pakistan be in fielding it?

In the May 1998 tests, Pakistan had tested only HEU based devices. There is wide discrepancy between the Pakistani claims of the weapon yield and the international estimates. In the interview after the tests, AQ Khan<sup>52</sup> had claimed “four of the devices were small tactical weapons of low yield. Tipped on small missiles, they can be used in the battlefield against concentration of troops“. The international assessment of the yield from the Pakistani tests was 8-12 kT for the 28 May shot and 4-6 kT for the 30 May shot. Even if we accept the AQ Khan statement on tactical weapons, we are not wiser on its size; the smallest ballistic missile tested, when AQ Khan made the statement was the Hatf-1 which was 560 mm in diameter and had

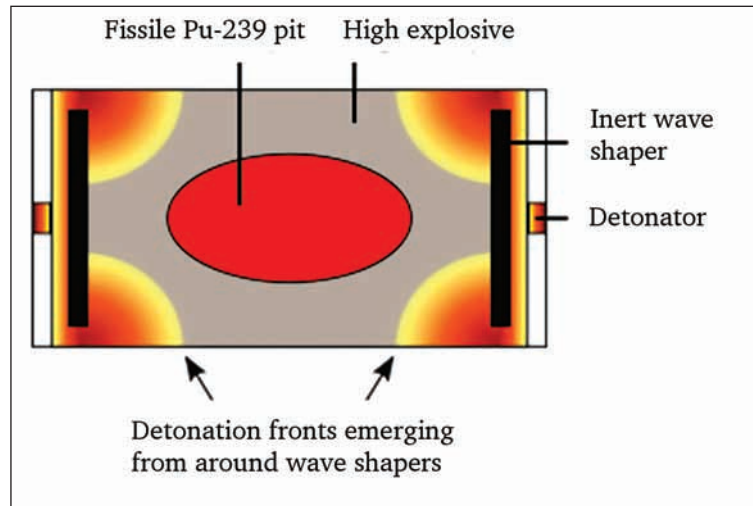
a range of 80 km. If a weapon system had been designed for Hatf-1 as claimed by Khan, it would be too large to fit into the envelope available with NASR.

Further miniaturisation to fit into the NASR class of missiles can probably come with a Plutonium based linear implosion device. A linear implosion allows for a low density, elongated non-spherical (rugby ball shaped) mass to be compressed into a supercritical configuration without using symmetric implosion designs. This assembly is accomplished by embedding an elliptical shaped mass in a cylinder of explosive. The explosive is detonated on both ends, and an inert wave shaping device is required in front of the detonation points. Such a device is shown schematically in Figure 9.

Such a device requires larger quantity - almost double - of plutonium as opposed to

<sup>52</sup> “Interview with Abdul Qadeer Khan,” The News Islamabad, Saturday, May 30, 1998, available at <http://nuclear-weaponarchive.org/Pakistan/KhanInterview.html>.

**Figure 9: Linear Implosion Device**



the requirement in spherical compression. A Pakistani design of such a device can be expected to weigh at least 100 kg. In the United States, extensive experimentation was needed to create a workable form, but this design enables the use of Plutonium as well as Uranium. The HEU device will obviously be heavier. Pakistan can at best work on the explosive + detonator combination with surrogate material, which is not the same as testing with the actual material. In the end, what Pakistan will have is an untested device.

### **PAKISTAN'S FISSILE MATERIAL PRODUCTION**

It is difficult to assess Pakistan's weapon priorities and hence the fissile material production strategy. Pakistan has uranium deposits with rather poor concentration. Its first mine was at Bagalchore, which ceased production in 2000. The production is now from deposits at Nanganai and Taunsa near

Dera Ghazi Khan using in situ leaching process. Nanganai started production in 1996 and Taunsa in 2002. The OECD/IAEA estimate shows uranium production in Pakistan at 23 tonnes per annum till the year 2000 and 40 tonnes per annum from 2002 onwards. Pakistan has enrichment facility at Kahuta and Plutonium processing reactors at Khushab. One 50 MWt reactor-Khushab 1 has been in production since 1998. Khushab 2 may have become operational in 2010 and Khushab 3 may be ready in 2012. Khushab 4 is also being erected. Using satellite imagery Tamara Patton<sup>53</sup> has estimated the Khushab reactors capacity to be in the 40-90 MWt range.

Pakistan's nuclear weapons programme is mainly based on enriched uranium. The tests carried out by Pakistan on 28 and 30 May 1998 were based on HEU and had yields of 11-12 kT and 4-6 kT respectively. There is no evidence of any Plutonium based tests at this. If one needs

<sup>53</sup> Tamara Patton "Combining Satellite Imagery and 3D Drawing Tools for Nonproliferation Analysis: A Case Study of Pakistan's Khushab Plutonium Production Reactors," *Science & Global Security: The Technical Basis for Arms Control, Disarmament, and Nonproliferation Initiatives*, 20:2-3, 2012, pp. 117-140, available at 10.1080/08929882.2012.719383.

to miniaturise the weapons, a plutonium based warhead is the answer, but the question arises on the design, development, realisation and deployment of an untested system. However, the setting up of the series of reactors at Khushab indicates that Pakistan is seriously considering the Plutonium based option.

The issue for Pakistan is one of Uranium availability. Its own reserves are limited and of poor ore concentration. As a non-member state of the NPT regime, it cannot import uranium for strategic purposes.<sup>54</sup> Pakistan will have to do a major balancing act between the HEU and Pu

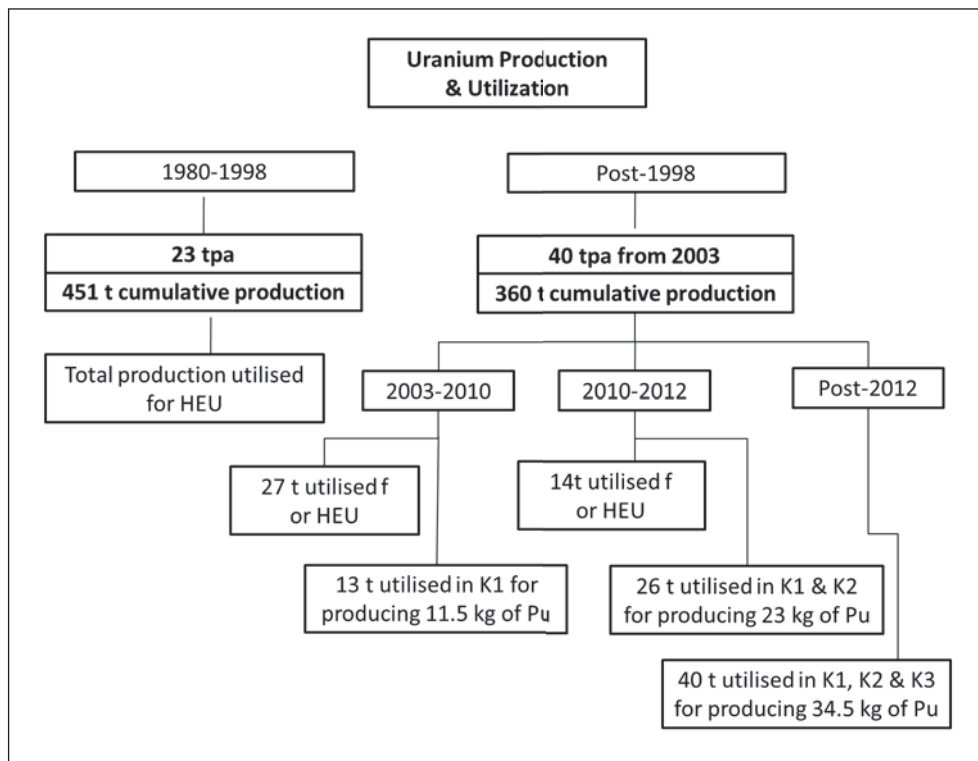
production-maybe even freeze the production of HEU. The possible production scenario is shown in Figure 10.

From the above table, the following conclusions (Table 3 and 4) can be arrived at in terms of Pakistan's HEU and the Plutonium stockpile:

**Table 3: Pakistani Highly Enriched Uranium (HEU) stockpile**

Uranium available 1980-98	451 t
Uranium available 2003-10	216 t
Uranium available 2010-12	28 t
Total (Which will yield 3220kg of HEU)	695 t

**Figure 10: Possible Uranium utilisation**



Note: The OECD/IAEA estimates for uranium production for the years 1998-2000 is 23 ton per year and in 2001 it is listed as 16 tons. Only from 2002, the higher production figures of 40 tons are indicated. Consequently, it is assumed, even though K-1 was ready in 1998, its feedstock was available only from 2000.

<sup>54</sup> Even if Pakistan were a member state of the NPT, importing fissile material for strategic purposes is a right which is available only to Nuclear Weapon States (NWS) as defined under the NPT.

Assuming 20 kg of HEU per weapon and subtracting 120 kg from the inventory as already used for the 1998 tests, the remaining inventory of **3100 kg** (till 2012) will translate to **155 warheads**.

**Table 4: Pakistani Plutonium (Pu) Stockpile**

Uranium diverted for Pu 2003-10	8 x 13 = 104 t	Which is equivalent to 92kg of Pu
Uranium diverted for Pu 2010-12	26 x 2 = 52 t	Which is equivalent to 46 kg of Pu
Total quantity of Pu		138 kg

Assuming 6 kg of Pu per weapon, this will translate to **23** warheads. As a linear implosion device will use nearly double the quantity of Pu, the Pu inventory will be adequate only for **12** TNW warheads.

In addition to the inventory of 23 warheads, if the total uranium output is diverted for Pu processing, Pakistan will be able add 5-6 warheads every year. This translates into addition of an untested weapon to the arsenal in very limited numbers which means it will take years to build a reasonable arsenal.

The ultimate question is how will Pakistan utilise its limited uranium reserves? Will it consider its tested HEU weapons in stock as adequate for its security or will it consider it necessary to diversify its stockpile? Another important question to consider is whether Pakistan will divert all or part of its uranium reserves for production of an untested Plutonium based weapon. Even here will Islamabad lay stress on Plutonium weapons for use with its cruise missiles like Babur and Ra'ad or will it deploy them on NASR despite its rather limited damage potential.<sup>55</sup>

<sup>55</sup> For more details on Pakistan's Cruise Missiles see, Rajaram Nagappa and S. Chandrashekar, "An Assessment of Pakistan's Babur HATF 7 Cruise Missile," NIAS Report R-5-07, 2007, *National Institute of Advanced Studies*, Bangalore, available at <http://issp.in/wp-content/uploads/2013/04/An-Assessment-of-Pakistans-Babur-HATF-7-Cruise-Missile.pdf>.

# COMMAND AND CONTROL, RISKS AND IMPLICATION FOR INDO-PAK NUCLEAR DETERRENCE

India's Cold Start rattled Pakistan and put a question mark - of some sort - on the logic of its nuclear strategy. Pakistan feels that India by its military doctrine had blurred the lines between sub-conventional and conventional warfare. On the other hand, the introduction of NASR as a response to CSD is seen by Indian analysts as threatening to lower the threshold for nuclear use and in essence a repeat of its threat to escalate a conventional military response to the nuclear level.

With NASR, Pakistan in essence has fallen back on its time-tested option of threatening to use its nuclear weapons in an attempt to involve the international community and thereby counter India's conventional military asymmetry. The problem with the Pakistani response given the limited objectives of any Indian strike under 'Cold Start' is that it might not be taken seriously and as a result could weaken the Pakistani deterrent.

However, Pakistan's thinking behind employing NASR could be to provide a flexible response to its decision-makers; something between massive (suicidal) response, engaging

in conventional battle, and doing nothing. NASR, as viewed in Pakistan, fits in a much-desired "graded and proportional punitive retaliation option."<sup>56</sup> As stated by Adil Sultan, "these perceived gaps at the operational and tactical levels were, therefore, needed to be plugged- to deny India the space to launch limited military operations in the form of Cold Start Doctrine".<sup>57</sup>

The acquisition of TNWs is yet another attempt to deny India any opportunity to fight a limited conflict with Pakistan. This is particularly important for Islamabad. According to Mansoor Ahmed, the testing of NASR highlights the qualitative shift in its nuclear posture by including counter-force and usable response options as opposed to a disproportionate nuclear response to a conventional conflict.<sup>58</sup>

As Pakistan's conventional forces are deemed inadequate to deal with India's conventional military onslaught, Islamabad believes that deploying TNWs would serve as a deterrent; based on the notion that any conventional attack from India's side would lead to the usage of TNWs, which could

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<sup>56</sup> Zafar Nawaz Jaspal, "Tactical Nuclear Weapon: Deterrence Stability between India and Pakistan," *US-Pakistan Strategic Partnership: A Track II Dialogue*, Center on Contemporary Conflict (CCC), Monterey, United States, January 2012, available at <<http://www.isn.ethz.ch/Digital-Library/Publications/Detail/?lng=en&id=142884>.

<sup>57</sup> Adil Sultan, "Pakistan's emerging nuclear posture: impact of drivers and technology on nuclear doctrine," Institute of Strategic Studies Islamabad, available at [http://www.issi.org.pk/publication-files/1340000409\\_86108059.pdf](http://www.issi.org.pk/publication-files/1340000409_86108059.pdf).

<sup>58</sup> Mansoor Ahmed, "Why Pakistan needs tactical nuclear weapons," *Pulse*, May 06, 2011, available at <http://www.weeklypulse.org/details.aspx?contentID=563&storylist=9>.

snowball into a nuclear fledged nuclear war. Many in Pakistan believe that TNWs provide the country a “value-added deterrence”, a notion reiterated by Rabia Akhtar who affirms that “a weapon that is small and usable possesses more deterrent value than a weapon which is big and has strategic value.” Aktar argues that HATF IX adds to the uncertainty in the adversary’s mind about the exact nature of Pakistan’s response in conjunction with its ambiguous “No No First Use (NNFU) posture which makes Pakistan’s deterrence effective.”<sup>59</sup> Consequently, Pakistan believes the possession of ‘usable nuclear weapons’ was needed to act as a deterrent against India.

### ANALYSIS OF NASR’S DAMAGE POTENTIAL

Given that Pakistan sees NASR as a battlefield nuclear weapon, it is also useful to see the weapon’s actual damage potential say against armoured divisions more importantly against tanks and Armoured Personnel Vehicles (APVs) against which it will be fielded in battle.

AH Nayyar and Zia Mian have indicated that an overpressure of 3 atm is required to damage and incapacitate a tank.<sup>60</sup> It is also seen that a 1 kT explosion at a height of about 150 m produces overpressures of this 3 atmosphere at a horizontal distance of 170 m from ground zero. The distance ratio scales as 1/3 power of the ratio of the yields and in case the yield is in the sub kiloton range, the horizontal distance will be much less. Assuming the same height of burst, the horizontal distance for 3 atmosphere

overpressure against yield is shown in Table 3 below:

**Table 5: Yield vs horizontal boundary of 3 atm overpressure**

Yield of Weapon	Horizontal distance
100 t	79.5 m
250 t	108 m
500 t	135 m
750 t	155 m
1000 t	170 m

It is understood that for the United States, an armoured formation for deliberate attack or breakthrough could use vehicle spacing of the 50 m apart from each other and the distance between the rows of tanks could be 200-250 m, which would translate to 80 tanks in a square kilometer (km<sup>2</sup>).<sup>61</sup> In such a worst case scenario not more than 3 tanks can be placed in a circle of 170 m diameter representing the 3 atmosphere overpressure boundary. For such a worst case scenario 27 high accuracy missiles will be needed to incapacitate all the tanks in the 1 square km (km<sup>2</sup>) grid. In the normal scenario, the battlefield commander will deploy the tanks with larger inter-tank distances to limit the damage potential. For example, maintaining the inter-tank distance to 200 m spread over 8 rows will reduce by half the number of tanks in the grid.

Even with a larger weapon system, the damage potential is low. Nayyar and Zia Mian estimate, a weapon with a yield of 15 kT could decapitate about 55 tanks if the inter-tank

<sup>59</sup> Rabia Akhtar, “NASR And Pakistan’s Nuclear Deterrence,” Eurasia Review, May 02, 2011, available at <http://www.eurasiareview.com/02052011-nasr-and-pakistans-nuclear-deterrence-analysis/>.

<sup>60</sup> AH Nayyar and Zia Mian, “The Limited Military Utility of Pakistan’s Battlefield Use of Nuclear Weapons in Response to Large Scale Indian Conventional Attack,” *Pakistan Security Research Unit*, Brief Number 61, Department of Peace Studies, University of Bradford, UK, November 2010.

<sup>61</sup> Nayyar and Mian, *Pakistan Security Research Unit*.

distance is 100 m. For an inter-tank distance of 300 m, to incapacitate 55 tanks, eight 15 kT weapons would be needed.

With the damage radius from a 1 kT weapon close to 170 m a number of TELs each equipped with four missiles will have to be deployed close to the battlefield and inviting retaliation.

Thus, it can be seen that NASR's likely damage potential is rather limited. The crew inside a tank has adequate protection against thermal and radiation effects and is equipped to operate in an NBC environment. Thus, the much touted battlefield utility of the NASR is minimal. Instead of providing any advantage in battle, it is likely to pose greater problems for Pakistan's armed forces.

## PAKISTAN'S NUCLEAR COMMAND AND CONTROL STRUCTURE

Pakistan's nuclear command and control (C<sup>2</sup>) is an important aspect which merits further consideration given the likelihood that NASR would be pre-delegated to battlefield commanders if it has to be used in battle. In such a situation nuclear command and control becomes more important and crucial factor ensuring the continuance of deterrence between India and Pakistan. This section will look at the command and control of Pakistan nuclear forces which is predominantly under the military's control. As in India's case, the structure has come into existence after the 1998 nuclear tests.

## ***Existing nuclear command and control structure***

After General Musharraf took over as the Chief of Army Staff, he consolidated the nuclear programme under complete military control.<sup>62</sup> With the establishment of the National Command Authority (NCA) in 2000 all strategic institutions crucial to nuclear and missile programmes such as the Khan Research Laboratories (KRL), National Engineering and Scientific Commission (NESCOM), Pakistan Atomic Energy Commission (PAEC) and the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), came under the NCA's control.<sup>63</sup>

The current command and control structure comprises three tiers, i.e. the National Command Authority (NCA) at the top; the Strategic Plans Division (SPD) which acts as the NCA's secretariat as the second tier; followed by the three services' (Army, Air Force and Navy) strategic forces command. It is based on C<sup>4</sup>I<sup>2</sup>SR (command, control, communication, computers, intelligence, information, surveillance and reconnaissance). Even though the structure has undergone many changes (including greater civilian participation) since its formulation; the real power continues to rest with the Pakistan Army.

The 2007 National Command Authority Ordinance stipulates the role of the NCA to exercise "complete command and control over research, development, production and use of nuclear and space technologies ... and to provide for the safety and security of all

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<sup>62</sup> 'Pakistan's nuclear oversight reforms' in Nuclear Black Markets: Pakistan, A.Q. Khan and the rise of proliferation networks, IISS Strategic Dossiers, 2007, available at <http://www.iiss.org/publications/strategic-dossiers/nbm/nuclear-black-market-dossier-a-net-assesment/pakistans-nuclear-oversight-reforms/#western>.

<sup>63</sup> Pakistan's nuclear oversight reforms, IISS Strategic Dossiers.

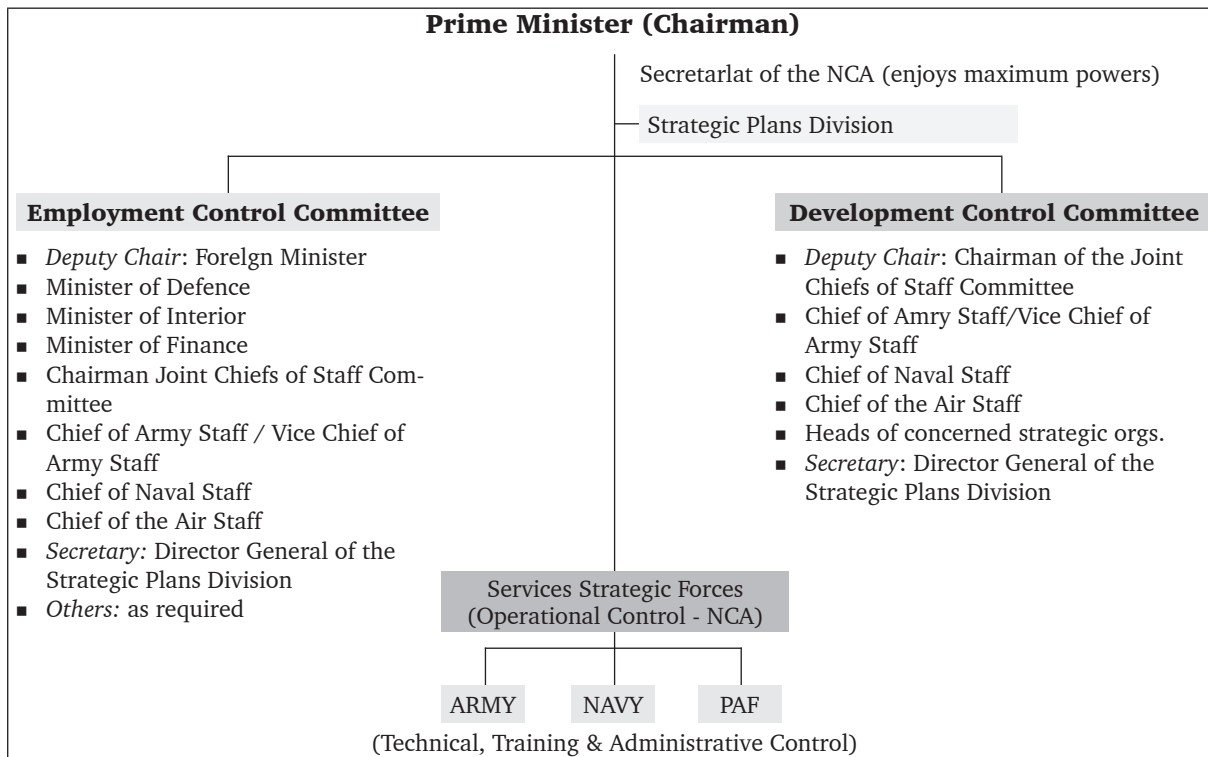


personnel, facilities, information, installations or organisations” with regard to the nuclear and space programmes.<sup>64</sup> The NCA, which is composed of civilian and military officials bifurcates into two committees specifically, the Employment Control Committee (ECC)<sup>65</sup> and the Development Control Committee (DCC).<sup>66</sup>

Pakistan’s nuclear command and control structure is depicted in Figure 11.

In order for a decision for a nuclear launch, it is likely that a consensus would be required with the final vote cast by the NCA Chairman.<sup>68</sup> Observers have however noted that in case a consensus cannot be reached a majority decision

**Figure 11: Pakistan’s nuclear command and control structure<sup>67</sup>**



<sup>64</sup> Eric Auner, “Pakistani Nuclear Weapons Now Under PM,” Arms Control Association, January/February 2010, available at <http://www.armscontrol.org/print/4046>.

<sup>65</sup> The ECC overlooks the country’s nuclear strategy, deployment and engagement of strategic forces, in addition to periodically reviewing strategic threat perceptions, weaponry’s developmental progress and establishing guidelines for effective C2 practices. See, Paul K. Kerr and Mary Beth Nikitin, Pakistan’s Nuclear Weapons: Proliferation and Security Issues, Congressional Research Service, February 13, 2013, available at <http://www.fas.org/sgp/crs/nuke/RL34248.pdf>.

<sup>66</sup> The DCC exercises control over all the strategic organisations that participate in the nuclear programme. See, Paul K. Kerr and Mary Beth Nikitin, “Pakistan’s Nuclear Weapons: Proliferation and Security Issues”, Congressional Research Service, March 19, 2013, available at <http://www.fas.org/sgp/crs/nuke/RL34248.pdf>.

<sup>67</sup> Pakistan’s nuclear oversight reforms’ in Nuclear Black Markets: Pakistan, A.Q. Khan and the rise of proliferation networks, IISS Strategic Dossiers, 2007, available at <http://www.iiss.org/publications/strategic-dossiers/nbm/nuclear-black-market-dossier-a-net-asesment/pakistans-nuclear-oversight-reforms/#western>. The figure has been slightly amended to incorporate the change stipulated by the National Command Authority Act, 2010 (Replacement of the Chairman by the Prime Minister).

<sup>68</sup> Pakistan’s nuclear oversight reforms, IISS Strategic Dossiers.

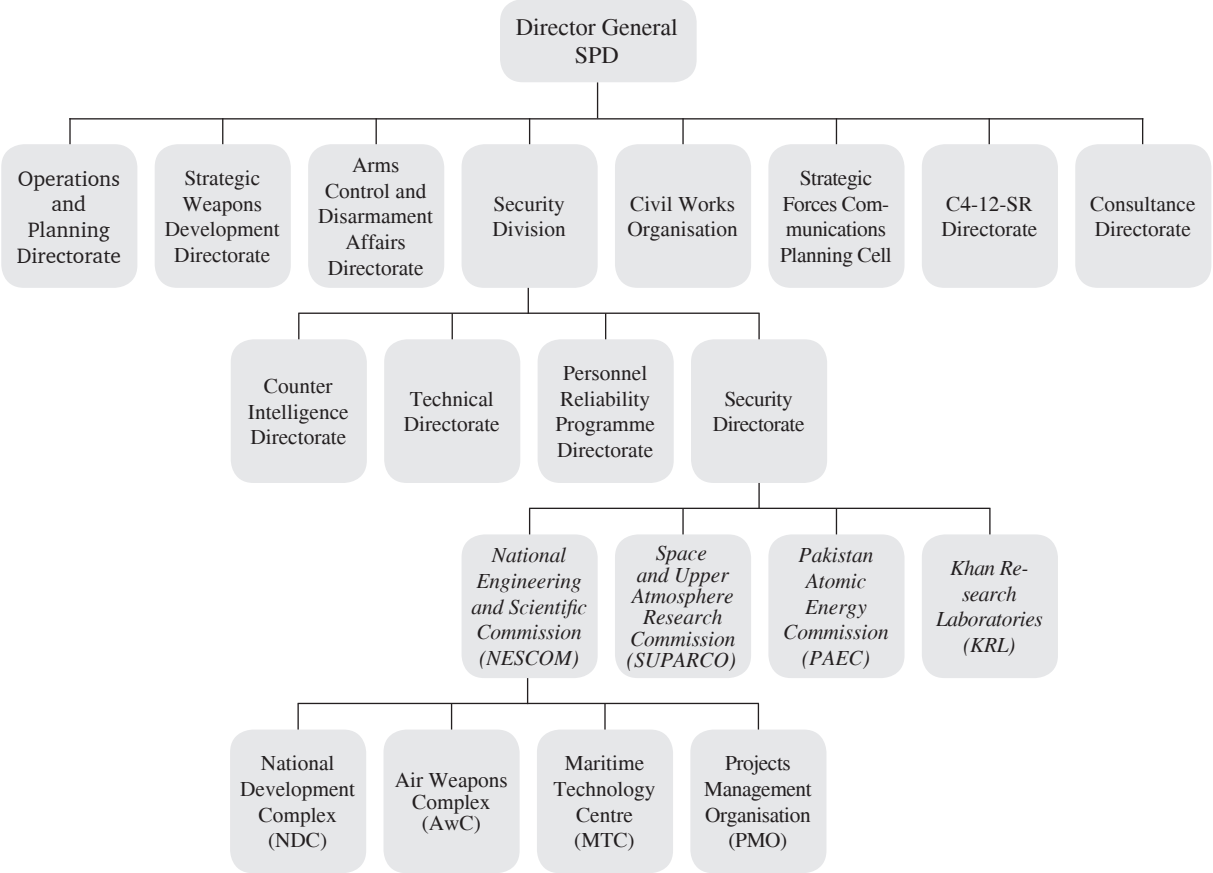


would suffice.<sup>69</sup> Previously, the post of the NCA Chairman was held by the President of Pakistan but this changed with implementation of the National Command Authority Act 2010, which appointed the PM as the head of the NCA. The 2010 Act became law with the passing of the 18<sup>th</sup> Amendment in April 2010. Thus on paper it is the Pakistani PM who is responsible for taking the final decision on a nuclear strike, but the reality on the ground is quite different. When analysing the NCA structure, it becomes evident that majority of the positions are held by serving or retired military

officers. Clearly, the military, specifically the Army, remains in charge of the nuclear command and control and has the final say in carrying out a nuclear strike. As Amir Mir, a senior Pakistani journalist states, “General Kayani and Lt. Gen. Khalid Kidwai have their fingers on the N-button and would exercise complete control with little regard for the will of the Prime Minister.”<sup>70</sup>

The SPD acts as the Secretariat for the NCA and plays a pivotal role in Pakistan’s nuclear command structure. It is tasked to formulate policy options, execute the NCA’s

**Figure 12: Structure of Pakistan’s Strategic Plans Division (SPD)**



<sup>69</sup> Bruno Tertrais, “Pakistan’s nuclear and WMD programmes: Status, Evolution and Risks,” Non-Proliferation Papers No. 19, EU Non-Proliferation Consortium, July 2012, available at <http://www.nonproliferation.eu/documents/nonproliferationpapers/brunotertrais5010305e17790.pdf>.

<sup>70</sup> Amir Mir, “Whose finger on Pakistan’s nuclear trigger?” *Asia Times Online*, November 17, 2011, available at [http://www.atimes.com/atimes/South\\_Asia/MK17Df03.html](http://www.atimes.com/atimes/South_Asia/MK17Df03.html).

operational plans and directions on the service levels, in coordination with the three services' SFCs.<sup>71</sup> Figure 12 provides an overview of the organisation of the SPD. As of 2012, the SPD is believed to comprise of 150 officers<sup>72</sup> drawn from the three armed forces and enjoys immense administrative influence in terms of research and development; and production of ballistic and cruise missiles.<sup>73</sup> The branch is headed since its creation by a three-star general namely Lt. Gen. Khalid Kidwai; indicating the Army's dominance in the nuclear command and control structure. Needless to say, the Army's SFC enjoys maximum power for it remains in-charge of all the operational missiles.<sup>74</sup>

### ***Possible changes in Pakistan's Command and Control due to NASR***

After an overview of the strategic nuclear command and control, it is germane to look at how NASR would impact the current command and control structure. The complications involved with the fielding of NASR missile include the dilemma of pre-delegation of authority to battlefield commanders or centralised control. There are two aspects to the above quandary. In case of delegation of control to local commanders, the possibility of accidental or unauthorised launch increases. On the other hand, extreme centralised control over the

weapons may make these weapons vulnerable to a pre-emptive strike. Also increased centralised control defeats the very purpose that such weapons are supposed to serve, which is of being employed in the battlefield against advancing Indian conventional forces.

Also, in operational terms, due to the short range of the missile, it is likely that the weapon system would be stationed near the border making it relatively difficult for the central authority to exercise absolute control over them. The introduction of such a tactical nuclear weapon (TNW) system would inexorably require a degree of pre-delegation to the local commanders due to operational exigencies, as also reflected in the case studies of other countries like the US and Russia which employ tactical nuclear weapons.

It is therefore highly likely that the Pakistani Army would institute devolution practices while inducting NASR into service. This is reinforced by Brig (Retd) Feroz Hassan Khan, former deputy director of Pakistan's SPD who states that, "partial pre-delegation, especially for the weaker side, would be an operational necessity because dispersed nuclear forces as well as central command authority (National Command Authority) are vulnerable."<sup>75</sup> Interestingly, Pervaiz Iqbal Cheema remarks that "perhaps even Corps Commanders would be involved in the decision to use nuclear weapons."<sup>76</sup>

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<sup>71</sup> Bruno Tertrais, "Pakistan's nuclear and WMD programmes: Status, Evolution and Risks," Non-Proliferation Papers No. 19, EU Non-Proliferation Consortium, July 2012, available at <http://www.nonproliferation.eu/documents/nonproliferationpapers/brunotertrais5010305e17790.pdf>.

<sup>72</sup> Feroz Hassan Khan, *Eating Grass: The Making of the Pakistani Bomb*, California: Stanford Security Studies, 2012, p. 332.

<sup>73</sup> Strategic Plans Division (SPD), Nuclear Threat Initiative (NTI), available at <http://www.nti.org/facilities/585/>.

<sup>74</sup> Strategic Plans Division (SPD), Nuclear Threat Initiative (NTI).

<sup>75</sup> Feroz Hassan Khan, "Nuclear command-and-control in South Asia during Peace, Crisis and War," *Contemporary South Asia*, 2005, 14(2), pp. 163-17.

<sup>76</sup> Scott D. Sagan, James J. Wirtz, *Planning the Unthinkable: How New Powers Will Use Nuclear, Biological, and Chemical Weapons*, New York: Cornell University Press, 2000, p. 75.

With TNWs at play in a future Indo-Pak conflict, Pakistan's nuclear posture and command and control would have to undergo a metamorphosis. The TNWs would most likely be used when conventional war is already underway (with the exception being a pre-emptive attack) when communication systems and command and control structures are already under pressure. This will thus add another layer of complexity to the already complex system. In order to obviate the possibility of a pre-emptive Indian strike on its TNW assets and for use in battle, pre-delegation would in all likelihood be necessary so that the battlefield commander takes stock of the dynamic situation and responds adequately keeping in mind several factors including survivability of the weapon system and his current position vis-à-vis the enemy in battle.

In a war, the situation remains dynamic, demanding quick decisions and executions. The time taken to receive release authorisations from the higher echelons would be long, considering the swiftness with which the situation on a battlefield changes. The period may vary from few hours (6-7 hours) to days (1-2 days), depending on various factors like the military situation, C2 efficiency and other technical issues before a go-ahead can be given. Keeping these aspects in mind, the Pakistani military would logically want to minimise any delay, and lay down procedures that ensure quick assembly of the weapon, identification and engagement of the targets, which necessitates pre-delegation to front commanders.

## **NASR: THE RISKS INVOLVED**

The deployment of TNWs in a conflict necessitates a degree of pre-delegated authority. The practice of pre-delegation in itself is a concern because during times of heightened crisis, one can expect the warhead and the missile to be mated with the commanders being given a degree of authority in employing the weapons. Thus, during crisis decisions taken by the commanders to use the weapons, may be affected by stress, misinformation or breakdown in communication links and in extreme situations even panic.

The dangers of NASR are threefold; namely, inadvertent escalation, unauthorised use or loss of possession.<sup>77</sup> The first, namely inadvertent escalation, could take place when either side uses nuclear weapons without actually intending to do so. This is in essence, the 'use them or lose them' dilemma. Faced with a worsening situation on battle front and posed with the possible danger of defeat, a battlefield commander could decide to use such tactical nuclear weapons. Thus, pre-delegation clearly increases the dangers of inadvertent escalation where use of such a nuclear weapon might take place without the country actually wanting to do so.

The second danger posed by tactical nuclear weapons like NASR is unauthorised use where the weapon is used by military commanders without due authorisation. Brig. Feroz Khan has pointed to the likelihood of such a situation and states:

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<sup>77</sup> For more on the dangers of unintended use of nuclear weapons in South Asia see, Rajesh Rajagopalan "The Threat of Unintended Use of Nuclear Weapons in South Asia," in E. Sridharan, Ed., *The India-Pakistan Nuclear Relationship: Theories of Deterrence and International Relations*, New Delhi: Routledge, 2007, pp. 266-286.

“...communications invariably get disrupted in a conventional war... in the event of a command breakdown...a theatre commander, seeing the opponent’s forces marching into his area of responsibility, would be hard-pressed to stand by and take no action. In the absence of communication with authorised national command authorities, such a theatre commander would probably take matters into his own hands.”<sup>78</sup>

This scenario illustrates the degree of stress under which the field commander will have to take his decisions and such occurrences may convince him to jump to the highest rung thereby further escalating the crisis.

The third danger posed by NASR is loss of possession of the actual weapon. This could either be when the nuclear weapon falls into the hands of terrorist or when it falls into the hands of the adversary. This also raises the added dilemma of what Scott Sagan describes as ‘goal displacement,’ with nuclear weapons being identified with national pride and security to such an extent that ends and means get confused.<sup>79</sup> Thus, rather than providing deterrence and securing Pakistan, the nation has to spend additional money and resources to safeguard the weapon and ensure that it does not fall into wrong hands.

Given that battlefield nuclear weapons like NASR will be pre-delegated, it raises the chances both of inadvertent and unauthorised use. In addition, due to weaker command and control given the fact that the weapons might be used in a battlefield scenario; it also raises

the dangers of the actual weapon system falling into hands of the advancing adversary (Indian forces) as well as *jehadi* groups with or without insider help.

## **NASR AND THE ROBUSTNESS OF NUCLEAR DETERRENCE BETWEEN INDIA AND PAKISTAN**

Crucial in one’s success in a signalling game is whether the adversary perceives one’s signal as a strong or a weak signal. Despite international concerns following Pakistan’s claims about NASR, in New Delhi it has been life as usual. This is largely due to doubts about Pakistan’s claim that NASR is nuclear capable. It is most likely that the nuclear warhead - which can fit into NASR given its dimensions - would be a plutonium based linear-implosion device. During its 1998 nuclear tests Pakistan did not test a plutonium device. Fielding an untested device would weaken Pakistan’s deterrent and is therefore counterproductive. Another reason for doubting Pakistan’s claim is the low quality of Pakistan’s natural uranium ore. As discussed in previous sections, there are doubts whether it can produce enough fissile material to simultaneously stockpile uranium and plutonium based weapons in enough numbers.

These reasons lead New Delhi doubt Islamabad’s claim that its short-range NASR is nuclear capable. Therefore, despite having the capability to miniaturise its nuclear warheads and the requisite delivery platform, India has not found it necessary to respond to NASR, despite claims to the contrary being made by Pakistani scholars.<sup>80</sup> Islamabad should re-

<sup>78</sup> Feroze Hassan Khan, “Challenges to Nuclear Stability in South Asia,” *Non-Proliferation Review*, 10(1), 2003, pp. 59–74, available at <http://cns.miiis.edu/npr/pdfs/101khan.pdf>.

<sup>79</sup> Scott Sagan, *Inside Nuclear South Asia*, pg. 237.

<sup>80</sup> Zahir Kazmi, “SRBMs, Deterrence and Regional Stability South Asia: A case study of NASR and Prahar,” Institute of Regional Studies, Islamabad, available at <http://www.irs.org.pk/strategic/sps012.pdf>

consider its gambit of lowering its nuclear threshold to counter an assault by the Indian military. An important question for Islamabad's strategists to ponder over is whether Pakistan's deterrent capability strengthened or weakened by the NASR? As pointed to from the above discussion, the answer is the latter. Surely, a weak nuclear deterrent cannot be in Pakistan's national interest.

Does NASR signify a shift from first use to first strike? Does it mean further lowering of the nuclear threshold by Pakistan in order to counter India's Cold Start doctrine and take away from India the space and the option to respond to a low-intensity conflict waged by Pakistan by way of supporting terrorist groups to carry out attacks in Kashmir and in other parts of India? Given that Pakistan's strategy of supporting terror groups is a low cost, low risk operation with the significant benefit of tying down Indian military and security forces, it would not like to give up this option.

The red lines as outlined by General Kidwai and by statements made by several Pakistani leaders have been understood to mean that Pakistan's threshold is not very low. However, with NASR, in a bid to provide Pakistan with a flexible option and in order to retain the sub-conventional conflict going, has this changed? One has to ponder whether Pakistan is signalling a lowering of its threshold for nuclear use to situation where it would respond or threaten to respond against limited conventional 'punitive' strikes carried out by India in response to say another Mumbai 26/11 type terrorist attack or explosion of a radiological dispersal device.

However, it would be important for Pakistan's decision makers to remember that the Indian nuclear doctrine does not distinguish between tactical and strategic nuclear weapons

or such use. India continues to adopt a no-first use (NFU) policy and its nuclear doctrine clearly assures 'massive retaliation inflicting unacceptable damage' against 'nuclear attack on Indian territory or on Indian forces anywhere.'

An important question to ponder over and one that holds some importance for nuclear stability in the Indian sub-continent is whether NASR is leading Pakistan into a 'commitment trap.' It would be wise to guard against a situation where Pakistan would be forced to follow through just because of its past assertions. Given that Pakistan has made statements about all that NASR can achieve, would it be forced into a position where it will have to follow through in order to maintain the credibility of its claims. It is unclear how organisational biases will impinge on Pakistan's decisions of threatening to use nuclear weapons even if the situation is fairly low on the threat matrix and does not warrant such a threat or use.

## CONCLUSION

NASR poses multiple dangers for the robustness of nuclear deterrence between India and Pakistan. These can be categorised into three categories; namely, credibility-related; doctrinal-related and operational-related.

The credibility-related problem in essence can be traced back to the fact that the nuclear warhead used in NASR has not been tested by Pakistan. As a result of this, Pakistan's nuclear deterrent is weakened.

The second problem is doctrinal. The Pakistani employment of NASR could possibly signify a shift from a 'first-use' policy to a 'first strike' policy. This could be as a result of Pakistan's search for more flexible responses. This could translate into situations where Islamabad could threaten to use its nuclear

weapons even in situations where such a threat or use would not be necessary and therefore not credible.

Another 'doctrinal-related' danger flows out of the Indian nuclear doctrine. New Delhi's nuclear doctrine does not differentiate between a tactical and a strategic weapon or such use of a nuclear weapon. As stated in the doctrine and more recently by the NSAB Chairman, Shyam Saran, India's response in case nuclear weapons are used against it or its forces anywhere would be a massive. He states, "... the label on a nuclear weapon used for attacking India, strategic or tactical, is irrelevant from the Indian perspective."<sup>81</sup> This makes it amply clear that the doctrinal flexibility that Pakistan is looking to explore is unachievable given New Delhi's nuclear doctrine.

The third set of problems posed by NASR is operational-related. As outlined in earlier paragraphs given that pre-delegation would be resorted to by Pakistan, the weapon system would increase the dangers of inadvertent, unauthorised use. Also, given that the weapon system would be stationed close to the border and on the battlefield it is very likely that the command and control and physical security of the weapon would undergo a lot of strain especially under conflict situations. Pre-delegation also opens up the additional danger of a nuclear capable NASR being stolen by *jehadi* groups (with or without insider help) and also a

situation where NASR could fall into the hands of the advancing Indian troops given that it is likely to be stationed close to the border given its short range.

Another operational challenge for Pakistan is that the number of weapons which it would be able to produce - given the availability of its raw fissile material would be small. It would therefore not make any substantial difference to the numbers of nuclear weapons in Pakistan's arsenal. Also, as discussed in previous sections, NASR is unlikely to provide any great advantage to Pakistan in the battlefield given its limited damage potential against tanks and armoured carrier vehicles.

Thus, Pakistan's gambit of using NASR to signal a lowering of its nuclear threshold to counter any conventional military operation by India is likely to pose challenges for robustness of nuclear deterrence between Pakistan and India. An important question to ponder over and one that holds some importance for nuclear stability in the Indian sub-continent is whether NASR is leading Pakistan into a 'commitment trap.' It would be wise to guard against a situation where Pakistan would be forced to follow through just because of its past assertions.

The study shows that a weapon system like NASR has more disadvantages than advantages from all considerations ranging from damage potential to impact on deterrence stability.

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<sup>81</sup> Shyam Saran, "Is India's Nuclear Deterrent Credible?" April 24, 2013, India Habitat Centre, New Delhi.



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