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Issue Brief

The Importance of Passive and Active CBRN Defensive Measures

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S*ummary*

While the use of TNWs in the event of an India-Pakistan conflict is a situation that is best avoided, India cannot be held hostage to Pakistani provocations and the consequent loss of life in Pakistani sponsored and abetted terror attacks. Pakistan's willingness to raise the spectre of nuclear weapons use has thus far shaped much of the narrative. Despite the surgical strikes of 28-29 September 2016, India's response to Pakistan continues to be constrained by the threat of TNW use. While it is not even remotely being suggested that India should seek to launch a major military offensive against Pakistan, to ensure that it retains the flexibility for an escalating response, India will need to pay more attention to both passive and active defensive CBRN measures with a view towards negating as much of the impact of Pakistan's TNWs as may be practical. Progress has already been made in respect of the former, it is now necessary to build on that progress while working towards improving active CBRN defences.

Even before the Indian Army conducted surgical strikes against terrorist targets in Pakistan-occupied Kashmir (PoK) on the night of 28-29 September 2016, Pakistan has long been fond of rattling its nuclear sabre. It is true that Pakistan's purported development and deployment of tactical nuclear weapons (TNWs) and the means to deliver them poses challenges for any potential Indian conventional military response to an act of extreme provocation that may occur. But India is not without options and can indeed take steps to avoid crossing whatever Pakistan's nuclear redlines may be. Nevertheless, given the relative lack of clarity about what those nuclear redlines are, India may find itself faced with the choice of either abandoning a conventional military option or preparing, should the need arise, to call Pakistan's nuclear bluff. Should India choose the latter, the key to calling Pakistan's nuclear bluff lies in ensuring that the Indian armed forces are prepared to meet the threat of TNW use by Pakistan. This involves taking both adequate passive measures to mitigate the impact of a TNW attack and active measures to intercept delivery vehicles aimed at Indian targets.

Pakistan's Nuclear Thresholds

Pakistan's nuclear "red-lines" have not been clearly defined. While this is by no means surprising, in the discourse on Pakistan's nuclear doctrine four thresholds have been identified:

- **Spatial:** Indian armed forces occupying a large swathe of Pakistani territory.
- **Military:** Indian armed forces completely knocking out or comprehensively destroying a large part of the Pakistani armed forces.
- **Economic:** Any Indian attempt to economically strangle Pakistan.
- **Political:** Possibly, an attempt to militarily assist a secessionist movement in Pakistan to the extent that the said movement has a reasonable chance of success.

None of these thresholds is, however, well defined. For instance, it is difficult to imagine any country using nuclear weapons to break an economic blockade. Indeed, the viability of such a response is questionable as retaliation would inevitably follow. Similarly, the political threshold lacks credibility in the absence of a clearer description of what the target of a nuclear weapon would be. Is Pakistan concerned about an Indian military intervention in support of an independent Baluchistan a la Bangladesh? This lack of clarity and, it is suggested, implausibility, renders the political threshold somewhat suspect. This also holds true, and to a greater extent, for the military threshold. Where does the threshold for "comprehensively destroying a large part" of Pakistan's armed forces lie? The spatial threshold is perhaps most easily understood and as such also the easiest to incorporate into operational planning by the Indian military.

The Battlefield: Possible Theatres of Operations

An India-Pakistan conflict could take place in four major theatres, each varying in geography and, to a lesser extent, in climatic conditions. The theatres of operations are:

- 1) Along the Line of Control – Northern Kashmir region
- 2) Southern Jammu & Kashmir and Punjab sectors
- 3) North and Central Rajasthan
- 4) South Rajasthan and Gujarat

Each of these areas offers a mix of opportunities and challenges, and the Indian military would need to make an appropriate judgement as to the area most suitable for offensive operations. Over the years, India has shown a degree of adaptability in modifying its doctrine to suit changed circumstances. For example, in 1987, the Army conducted a massive military exercise, 'Brasstacks', which outlined what was then a new doctrine. No longer would it concentrate on operations in Punjab, as it had during the 1965 war. Under the new doctrine, it would deploy powerful armoured formations in the Rajasthan sector with the aim of bisecting Pakistan at its weakest point in the Sindh Province. This model is now clearly unworkable as any such existential threat would cross Pakistan's spatial threshold. Nevertheless, the risk of TNW use is at its highest in this sector.

India has, in acceptance of a changed reality, abandoned the "Brasstacks" concept. No longer will the Army attempt to make major territorial gains. Instead, it will concentrate on occupying small stretches of territory and in the process take care not to cross Pakistan's spatial threshold. The territory occupied would not threaten Pakistan's existence, but would be enough to force Pakistan to commit its forces where they will be met and attrited by superior Indian firepower. By altering its offensive doctrine and possibly opening up new areas for possible offensive action – such as along the Line of Control – India has sought to nullify Pakistan's threat of nuclear weapons use.

Further evidence of change can be found in India's attempt to reduce the time taken to commence military operations. Concerned at the lengthy mobilization witnessed during Operation "Parakram", India has made significant progress in reducing the time taken to prepare and conduct offensive operations. Despite official denials of its existence, the "Cold Start" proactive military doctrine seems to be the current incarnation of this approach, aiming to commence military operations within 48 hours of the orders being given, and limiting territorial aims while seeking to engage and inflict attrition on the Pakistani armed forces. It is a fully legitimate question to ask whether this risks crossing the Pakistani "military threshold" for nuclear use. What, for example, would Pakistan deem "unacceptable damage" to its military forces? It is, therefore, submitted that Pakistan's threat to use TNWs in the event of its forces being decimated is a bluff which, in the event

of hostilities, India must be willing to call. In this regard, both passive and active CBRN (Chemical, Biological, Radiological and Nuclear) measures assume importance.

Indian Army's Readiness for CBRN warfare

The Indian Army consists of 13 Corps-sized formations with a total of 37 divisions and a number of independent brigades. The cutting edge of the Army is centred on three Strike Corps – each built around an armoured division. The three Strike Corps – 1, 2 and 21 – are composed of an armoured division (33, 1 and 31, respectively) and two infantry divisions with supporting units. In addition to these formations, the Army has five Independent Armoured Brigades, 15 Independent Artillery Brigades, seven Independent Infantry Brigades, one Independent Parachute Brigade, three Independent Air Defence Brigades, two Independent Air Defence Groups and four Independent Engineer Brigades.

India has understood that its previous operational doctrine, which emphasized the use of its three Strike Corps, was inadequate to meet the changing realities of the India-Pakistan battlefield. To this end, the previously designated “Holding Corps” along the India-Pakistan border have been renamed as “Pivot Corps”. And, they have been reinforced with the addition of eight Integrated Battle Groups (IBGs), which are of division size and combine mechanized infantry, armour, artillery and aviation assets. The IBGs are to work in conjunction with the Indian Air Force to conduct offensive military operations and be available for operations within 48 hours of the order being given. This re-orientation of assets has increased the offensive capability of previously defensively orientated formations.

To enable India to call Pakistan's nuclear bluff and further to enable its combat formations to operate effectively under the backdrop of TNW use, the Indian Army has to give priority to passive and active CBRN measures. Passive CBRN measures involve protecting personnel and equipment from the effects of CBRN use, while active measures involve the interception of the delivery systems of CBRN agents before they can inflict damage on their intended targets. The extent to which India has undertaken such measures is discussed below.

Passive CBRN Defensive Measures

India's 63 armoured regiments and 26 mechanized infantry battalions have significant levels of protection from CBRN attack. The Arjun, T-90 and T-72 tanks all have CBRN protection systems. The BMP-1 and BMP-2 force that conveys the mechanized infantry units have CBRN protection systems. And each BMP comes with two TDP-1 decontamination kits. It is, however, unclear if India has maintained and replaced life-

expired filters on these vehicles or refurbished and/or replaced ageing decontamination kits. In addition, India has also deployed a number of indigenously developed CBRN reconnaissance and decontamination vehicles. Of note, however, is its continuing reliance on towed artillery, which is far more difficult to operate in CBRN conditions; the lack of appropriate self-propelled artillery is a major deficiency. The latter point cannot be overemphasized as trying to operate towed artillery in a CBRN environment is not only difficult, but could place an excessive physiological strain on artillery crews operating in high ambient temperatures.

With respect to infantry formations, in the 1980s, the army began some tentative preparations for CBRN warfare. A quantity of CBRN equipment was imported from the USSR, but these proved to be useless in Indian environmental conditions. Following that, in 1987, the Defence Research and Development Organization (DRDO) produced prototypes of CBRN suits, decontamination suits, facelets, overboots and CBRN tents. This equipment has entered production and is in service with the armed forces. From 1987 onwards, the Army, through its College of Military Engineering, began running familiarization courses in CBRN warfare, while DRDO scientists have conducted courses at the brigade level.

The Ministry of Defence has allocated priority to the indigenous production of CBRN gear. This has also involved the participation of the private sector in the manufacture of CBRN suits. India seems to have purchased 50,000 S6 and S10 respirators and No.1 Mk3 suits from the UK in the 1980s (the types being identified through photographic evidence), 150,000 Draeger Kareta Nova respirators in the early 1990s, and subsequently a larger order of 334,000 full sets of Individual Protective Equipment (IPE) sets with CBRN suits and locally produced variants of the Kareta Nova respirator. Further purchases have included 40,000 new model CBRN suits in 2011. CBRN IPE has a limited shelf life and in order to retain CBRN readiness levels, India would need to replace life-expired items, refurbish them where possible and ensure proper storage of equipment. The latter point is of particular importance given India's climate, which could be detrimental to the integrity of CBRN respirators if special care is not taken.

To the extent that research has thus far permitted, it is suggested that, at present, India has an adequate stock of CBRN gear for individual protection of its infantry units. Older equipment is now making way into training establishments and new production replacing IPE sets that have become life-expired. Decontamination equipment, locally designed and manufactured, is also available in some quantity but on a scale that is far from lavish. However, it is a matter of conjecture whether the army's towed artillery crews are issued with or trained to operate in CBRN gear.

Despite all the above, the exact status of CBRN preparedness and training in the Indian Army remain unclear. For instance, it is unclear as to whether training and equipment

has gone down to the battalion level. It is certainly the case that outside of CBRN exercises, Indian troops do not carry CBRN haversacks. Since the late 1990s, some exercises have been conducted with troops in full CBRN gear and decontamination vehicles in operation – the latest being in April 2016. However, these exercises have not been widely publicized and their extent is not clear. Nevertheless, it is clear that the foundation for reasonably strong passive CBRN measures has been laid in the Indian Army. It remains to be seen if the threat of Pakistani TNWs will provide further impetus in this regard.

Active CBRN Defensive Measures

The Corps of Army Air Defence possesses one of the largest arrays of medium and short-range air defence systems of any army in Asia. At present, AAD has, in pride of place, two Air Defence missile groups – 501 and 502 – equipped with Kvadrat SA-6 surface-to-air missiles. In addition, there are 23 regiments with Bofors L-40/70 towed anti-aircraft guns, four with ZSU-23/4 self-propelled AA guns and a similar number with Tunguska systems, 11 composite regiments equipped with a combination of ZU-23-2 guns and Igla 1M missiles. These are complemented by a number of mobile point-defence missile regiments with OSA-AKM SA-8b and Strela-10M SA-13 missile units. Two regiments of Akash SAMs are on order, with delivery already in progress. Despite the size of the Corps of Army Air Defence, given its possession of only two medium-range SAM groups and an increase in the number of mechanized units needing protection (the eight IBGs for example), the Army's air defences are quantitatively inadequate to ensure adequate protection to formations. Thought must therefore be given to expanding the number and quality of air defence assets.

Any Pakistani TNW strike would need to be delivered either by manned aircraft, cruise missiles or ballistic missiles. At present, the Indian Army air defence is geared to defend against threats from manned aircraft and, to a lesser extent, subsonic cruise missiles. It is neither structured nor equipped to deal with TNWs delivered by ballistic missiles. Furthermore, other than the Akash and SA-6 systems, the equipment available is designed primarily to ward off an attack from low-flying aircraft. The army currently lacks any ability to detect or intercept even short-range ballistic missiles such as Pakistan's Nasr.

While it is indisputable that ballistic missile defence systems should be a priority for India for the defence of critical military and civilian targets – cities, air bases, strategic weapons complexes and critical supply depots for vital stores and fuel – it is also important that India considers some limited defensive capability for its military formations. The Indo-Israeli MRSAM currently being tested for the Indian Air Force could offer the requisite capability. To this end, the MRSAM testing programme should include testing against a ballistic missile target.

Furthermore, to evaluate its current systems – in particular the Akash – against missiles such as the Nasr, India should carry out exercises aimed at evaluating the ability of its radars to detect missiles such as the Nasr and the intercept capability of the Akash. Early in its development, it was widely speculated that the Akash would have some capability against ballistic missiles but thus far none has been demonstrated. The idea of using SAMs against missiles is not as far-fetched as it may first seem, as the United States and Russia have tested a variety of SAMs – HAWKs and V-750 SA-2s among them – against ballistic missile targets. It is probable that there will need to be some changes to the Akash algorithms, which are optimized for aircraft intercept. But the experiment would be worth the effort.

Conclusion

While the use of TNWs in the event of an India-Pakistan conflict is a situation that is best avoided, India cannot be held hostage to Pakistani provocations and the consequent loss of life in Pakistani sponsored and abetted terror attacks. Pakistan's willingness to raise the spectre of nuclear weapons use has thus far shaped much of the narrative. Despite the surgical strikes of 28-29 September 2016, India's response to Pakistan continues to be constrained by the threat of TNW use. While it is not even remotely being suggested that India should seek to launch a major military offensive against Pakistan, to ensure that it retains the flexibility for an escalating response, India will need to pay more attention to both passive and active defensive CBRN measures with a view towards negating as much of the impact of Pakistan's TNWs as may be practical. Progress has already been made in respect of the former, it is now necessary to build on that progress while working towards improving active CBRN defences.

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