PAKISTAN'S POSTURE OF CREDIBLE MINIMUM DETERRENCE: CURRENT CHALLENGES AND FUTURE EFFICACY

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Introduction:

Pakistan's security policy entails a posture of **Credible Minimum Deterrence** (CMD) which is incrementally in place since the country's overt nuclearisation in May 1998. A few dimensions of the CMD posture have been formally pronounced, albeit piecemeal, while the overall nuclear doctrine remains to be fully stated. Pakistan formally announced a National Command Authority (NCA) in 2000 and its constituents, with an embedded policy of continual updates. CMD has been the doctrinal foundation of Pakistan's deterrent strategy and has successfully served its policy objectives since its inception.[1] This is not to say that the CMD posture is perfect or continues to be flawless. Pakistan has neither aimed nor completed the full integration of nuclear weapons into its armed forces. [2] This puts a time lag on a ready response capability; no matter how immediate and efficient are the emergency procedures to mate warheads with delivery vehicles during red alerts when faced with crisis and conflict-situations. Pakistan's stockpiles of fissile material and current nuclear force levels are only adequate for CMD regime, unless immediate expansion is undertaken. The country does not possess an advanced reconnaissance satellite system for an independent strategic surveillance, though it has been successful in launching an elementary satellite. India's deployment of a BMD system, its technological augmentation and improvement of nuclear force levels, doctrinal postulation and its strategic partnership with the United States have a definite impact on Pakistan's posture of minimum credible deterrence. What began as 'minimum credible' a decade ago may not be credible tomorrow.

After a decades' successful functioning of the CMD regime, a reappraisal is imperative vis-à-vis a number of structural deficiencies, doctrinal challenges, and the threats to the safety and security of nuclear weapons. The regime also needs to be re-

examined against epigenetic fault-lines (disproportionate growth), organizational flaws, ideational incongruities, escalatory pressures, instability syndrome, dangers of accidental and unauthorised use of nuclear weapons, risks of being technologically outpaced and adversary's strategic responses: all of which may unilaterally or cumulatively impinge upon its future functioning, adequacy and credibility. It therefore necessitates a posture review to determine whether the CMD regime needs to be upgraded within its current strategic framework or be substituted by a more advanced nuclear deterrence regime. This paper aims to analytically evaluate Pakistan's CMD posture and assess its adequacy vis-à-vis the future challenges.

Nuclear Deterrence and Minimum Credible Deterrence: A Brief Review

Nuclear Deterrence is generally recognized an ability to dissuade an entity / state to desist from embarking upon a course of action prejudicial to one's vital security interests, on the basis of a **demonstrated capability** which is **credible enough to deliver unacceptable damage** and **firmly communicated** to the entity / state: as a result it (that entity / state) deviates from the stipulated course of action based upon the cost benefit calculus in which the potential loss (inflicted damage) from the stipulated action would far exceeds the likely gains. Although, there are no clearly defined parameters of various types / form of deterrence, the generally recognized categories are:

- Sufficient Deterrence (MAD with multiple capabilities).
- Extended Deterrence (Nuclear Umbrella to Allies).
- Graduate Deterrence (Proportionate to the Threat/s).
- Minimum Deterrence / Minimum Credible Deterrence)
- Existential deterrence (Deterrence as condition Vs Policy)
- Non-Weaponized Deterrence

The concept of minimum credible deterrence is widely adhered, but less clearly described in the jargon of nuclear strategy.[3] It originates from the notion that nuclear weapons, given their

immense destructive power and being "absolute weapons" have such a great equalizing impact in the calculus of deterrence that unacceptable damage can be delivered by relatively small number of nuclear weapons. A numeric equilibrium of nuclear weapons, like a conventional military balance, is unnecessary and even undesirable. An adversary possessing large nuclear weapons capability can be effectively deterred with small but credible nuclear forces.[4] The advocates of minimum deterrence argue that it helps avoid arms race, saves stupendous resources direly needed to other essential social services and development, and is less dangerous. Minimum deterrence has also been described in terms of its strategic objectives, which may themselves be limited. [5] It enables a relatively small and even industrially less developed country to muster resources for a minimum deterrent capability in the absence of alternative means of ensuring its security and survival. According to Kenneth Waltz, unlike conventional strategy, a deterrent (nuclear) strategy does not rely upon extent of territory, thus removing major cause of war, and deterrence effectiveness is dependent upon one's capabilities and the will to use these capabilities.[6]

Apparently, the above rationale inspired France under Charles De Gaulle to develop '**force de frappe**' as minimum credible French deterrent. Although, Britain had already adopted minimum deterrence posture as an important constituent of its nuclear strategy, the British raison d'être was different. It felt comfortable with the American and NATO nuclear umbrella unlike France which was skeptical about the credibility of American assurances for punitive retaliation against the former Soviet Union if France was attacked. China declared minimum credible deterrence as a doctrinal postulation for its small nuclear forces in the 1960s and 1970s to deter both, the United States and the former Soviet Union. Even today, despite a large disparity of nuclear forces, China aims to deter the United States with a limited number of ICBMS. Britain, France, and China each postulated deterrence at much lower levels of nuclear forces than the United States and the former Soviet Union, largely due to a complex interplay of economic, technical, political, and strategic factors. The three countries could not invest more resources into nuclear weapons without sharply impairing their national economies. The enormous destructive power of their

nuclear and thermonuclear weapons enabled each of these countries to hold at risk a sizeable percentage of their larger adversaries' population and industrial targets, with relatively lesser weapons. Strategically, each concluded that beyond a reasonable level of such assured destruction, no matter how academic these calculations were, more nuclear weapons were superfluous. In short, each country made a virtue of its limitations.[7]

Based on the above discussion, one should not assume that minimum deterrence level is a constant number which is unaffected by other related developments or is it immune to politico-strategic and technological developments taking place in the broader security landscape. The ultimate size of a minimum deterrence force is for instance, inversely proportional to factors such as the survivability of the force: the greater the survivability of the force, the smaller would be its size and the lesser the survivability of the force, the larger its size.[8] This in turn is related to the force configuration of the adversary. If the opponent has more accurate weapons and delivery systems capable of carrying out counter force strikes, the survivability of the force would be adversely affected by the same proportion. The second related factor is the degree of surety that the weapons would reach their intended targets once launched, which in turn depends on whether the adversary has deployed missile defence systems, and their capability to intercept and prevent the incoming missiles/aircraft from reaching their targets. If the survivability is low and/or the opponent has deployed missile defences, then obviously the size of the minimum deterrence force would be on the higher side.[9]

Chinese strategists take the concept of minimum credible deterrence as a relative one, defined not only by pure numbers, but more importantly by such key criteria as invulnerability of nuclear forces, assurance of retaliation, and credibility of counter-attack.[10] Echoing the Indian viewpoint, Jaswant Singh as Foreign Minister of India stated in 1998:

> The minimum is not a fixed physical quantification. It is a policy approach dictated by, and determined in, the context of our security environment. There is no fixity. Therefore, as

> our security environment changes and alters, and as new demands begin to be placed on it, our requirements too are bound to be evaluated.[11]

This description of minimum credible deterrence suggests that the concept needs to be understood in a fluid and dynamic context that would have multiple and constantly changing meanings.

However, minimum nuclear forces are not without their own fallacies. According to Lawrence Freedman: "Minimum deterrent forces are vulnerable to first strikes, compelling premature use, and hair-rigger responses and restricted to counter-city attacks."[12] To overcome these shortcomings of minimum deterrence to a possible extent, some nuclear states have started using the term, minimum credible deterrence.[13]

Rodney Jones points out that it is difficult to pinpoint what minimum means in the context of Pakistan and India. He asks:

> Does 'minimum' imply the sufficiency of small numbers of nuclear weapons? Nuclear weapons held in reserve? Low readiness or alert rates of a nuclear force? Renunciation of nuclear war fighting? Mainly counter-value targeting? Alternatively, does the term minimum merely make virtue of today's facts of life in the Subcontinent's limited resources, scarce weapons materials, unproved delivery systems, and still undeveloped technical military capabilities.[14]

Challenges and Threats to PCMD:

India poses a variety of challenges and threats to the Pakistan, foremost of which is **ideational**: its aggressive intent expressed and enacted through multiple ways: The **Indian nuclear doctrine** though does not mention Pakistan by name; it contains provisions, which can apply only against Pakistan. The **Indian armed capability**, especially **ballistic missiles** some of which are Pakistan specific pose a serious danger to Pakistan security and may undermine the credibility of PCMD posture. The Indian nuclear forces are relatively larger than Pakistan and are a strong

counterweight Pakistani deterrent capability. The **Ballistic Missile Defence (BMD)** has although a limited capacity to intercept ultra-supersonic ballistic missiles and cruise missiles, but it can still undermine the credibility of deterrence by intercepting some of the missiles and thereby limit damage, which would be prejudicial to deterrent stability between the two countries. These Indian threats to PCMD are analyzed in detail in the succeeding paragraphs.

Indian Doctrine of Credible Minimum Deterrence:

Although, the aim of this paper is not to offer an independent analysis of the Indian doctrine of minimum credible deterrence, the study of Pakistan's CMD posture would remain deficient without bring India into the focus. In the pursuit of its **Strategic objectives,** which are: the development of strategic power, security and power equilibrium vis-à-vis China, regional supremacy in South Asia against regional and extra-regional great-power, and international status equated with the possession of nuclear weapons (great power ambitions & behavior, UNSC seat etc.). India followed a leapfrog policy to develop its nuclear deterrent capabilities, while continuously denying their development. The May 1998 Indian nuclear tests were an overt demonstration of what India has been acquiring for the last three decades. On 17 august 1999, India pronounced a draft Indian Nuclear Doctrine, which proclaims the development and maintenance of credible minimum deterrence based upon a strategic triad of nuclear forces (land-based, air based and sea-based), second strike capability and punitive retaliation with nuclear weapons if deterrence were to fail. [15] The central part of the Indian Draft Nuclear Doctrine (DND) enunciates ***Credible Minimum Deterrence***.[16] Article 2.3 states that "India shall pursue a doctrine of **credible *minimum* nuclear deterrence**," but article 2.6 lays down a list of requirements, first two of which describe that deterrence requires India to maintain: "***Sufficient***, survivable and operationally deployable nuclear forces, with robust command and control system, and effective intelligence and early warning capabilities."[17] Article 2.3 proceeds to state: "This is a dynamic concept related to strategic environment, technological imperatives and the needs of national security. The actual size, components, deployment and employment of nuclear forces will be decided in the

light of these factors."[18] There is no official estimate or assessment of the credible minimum deterrence. Since the proclamation of the DND, India has been equivocal to describe or answer queries about 'minimum' deterrence. However, individual views of the some members of the National Security Advisory Board and others range around 400 nuclear and thermonuclear weapons.[19]

The DND outlines:

> "India's peacetime posture aims at convincing any potential aggressor that: (a) any threat of use of nuclear weapons against India shall invoke measures to counter the threat: and (b) any attack on India and its armed forces shall result in punitive retaliation with nuclear weapons to inflict damage unacceptable to the aggressor."[20]

However, the doctrine does not specify the measures India might undertake against any threat of use of nuclear weapons. If such stipulated measures were pre-emptive in nature, they would lead to strategic miscalculation and might generate an unintended conventional or nuclear clash, which ostensibly is its purpose to avoid. Article 2.7 of the draft Indian doctrine lends support to the possibility of pre-emptive measures when it says:

> "Highly effective conventional capabilities shall be maintained to raise the threshold of outbreak both of conventional military conflict as well as that of threat or use of nuclear weapons."[21]

The threat of conventional pre-emptive strikes against adversary's nuclear forces will generate chances of a nuclear war. Pakistan considers India's doctrine as offensive, provocative, and threatening regional security and global stability.[22] According to Rodney W. Jones, the Indian nuclear doctrine is based upon an expansive war-fighting force structure, without specifying adversaries, or an actual threat, and whose language alluded provocatively to using conventional pre-emptive capabilities offensively against any party that might threaten to use nuclear weapons against India and its armed forces.[23] Conventional wisdom

suggested that the Indian strategic elite considered nuclear weapons as essentially political weapons, only meant to enhance strategic power and status, but a close reading of the draft nuclear doctrine indicates that it is an aggressive war fighting doctrine. It is escalatory in nature, generates pre-emptive threats and therefore, would undermine deterrent stability if it were to be adopted in totality by the Indian government.

Command and control aspects are specifically addressed in the article 5 of the Indian draft nuclear doctrine. Article 5.1of the doctrine requires:

> "Nuclear weapons shall be tightly controlled and released for use at the highest political level. The authority to release nuclear weapons for use resides in the person of the Prime Minister of India, or the designated successor (s)."[24]

In actuality however, the Indian Prime Minister has not designated his successor (s), in public at least, which some quarters would expect, given his fragile state of health. The Indian nuclear doctrine generates ambiguity, some suggest deliberately, by saying that "authority to release nuclear weapons" for use rests with the Prime Minister without specifying any contingencies under which nuclear weapons would be released. It does not exclude a peacetime release or in any length of time earlier to a crisis-situation, or who knows that the weapons might have already been released. India has left open for its adversaries to guess the contingencies under which it would release or have already released nuclear weapons for use. Given the geographic proximity between India and Pakistan and extremely short early warning time, which is bound to be shorter than the time to release nuclear weapons, India's adversaries would consider it safer to presume that nuclear weapons have already been released to Indian military.

On January 4, 2003, the Indian Cabinet Committee on Security reviewed the operationalisation of India's nuclear doctrine and summarized a version, which in some ways significantly departs from the August 1999 DND.[25] The "No First Use" posture has been modified in two ways. First, a word "***anywhere***" has been added to

the provision on the No First Use, which now reads as follows, "nuclear weapons will only be used in retaliation against a nuclear attack on Indian territory or on Indian forces **anywhere**." [emphasis added]. It seems inclusive in case the Indian armed forces happen to be on another state's territory as an occupation force or even if in an aggressive mode.[26] Second, article VI of the operationalised nuclear doctrine renders the "No First Use" (NFU) declaration invalid by stating: "However, in the event of a major attack against India, or Indian forces anywhere, with biological or chemical weapons, India will retain the option of retaliating with nuclear weapons."[27] It is no more a "no-first use" of nuclear weapons declaration. As opposed to the original draft where only the use of nuclear weapons against India could have invited the 'punitive retaliation,' the use of chemical or biological weapons against the Indian forces even outside India would activate the Indian nuclear retaliation. Not only the NFU commitment has now been annulled but the threshold for the threat and use of nuclear weapons has also been lowered significantly. More so, the scope of possible use of nuclear weapons in geographical terms has been effectively expanded. The Operationalisation document also makes the article 2.5 of the DND fructuous. The article 2.5 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."[28] If any of these states henceforth possess any forms of WMD, they may be subjected the provisions of the Indian nuclear doctrine, to threats or potential use of nuclear weapons by India.

In an illustrative article, M. V. Ramana points out three specific dangers, which the deployment of nuclear weapons by India would pose to the security and stability of the South Asian region. He suggests that the reported "Indian policy to deploy nuclear weapons would open up the possibilities of accidental or unauthorised use of the weapons, and development of more weapons as a result of inter-service rivalry".[29] Ramana opines that so long as the low-intensity conflict in Kashmir continues unabated, it would continue to inject instability in the fragile nuclear relations of India and Pakistan. Deployment of nuclear weapons will inevitably demand delegating authority to military officers on the field for a host of reasons such as poor communications, short distances and

geographic contiguity between India and Pakistan, and resultantly, less early warning time. It reported that the Boeing 737-200 that took the Indian Prime Minister, A.B. Vajpayee, on a three-nation tour abroad in 2001 was not equipped with direct dialing facility. [30]

Indian Ballistic Missiles:

Indian ballistic missiles pose the most serious threat to Pakistan's posture of CMD. Although the origins of missiles development in South Asia go back to 1983 with launching of IGMDP:[31] the threat actualized after the deployment of various types and ranges of ballistic missiles in the Indian inventory. Prithvi (all the three versions) and Agni's two versions are deployed against Pakistan. On February 12, 2003, India test-fired Brahmos, the supersonic anti-ship cruise missile with a 280-290 kilometer range, purportedly a joint venture India and Russia. The Brahmos induced a new family (Cruise) of missile in South Asia, which compelled Pakistan to seek a counter-weight, which came in the form of Hatf-VII Babar cruise missile. The whole range of Indian ballistic missiles, whose details are listed below indicate the various challenges each one of them poses to deterrent stability in South Asia.

On August 25, India's Defense Minister authorized production of 300 short-range, nuclear-capable Prithvi missiles. The decision was taken in response to a reported August 15 test of the Ghauri III by Pakistan, an intermediate-range, nuclear-capable ballistic missile.[32] In a policy speech in the Parliamentary Consultative Committee, Jaswant Singh, as Defence Minister for a brief period, announced that Agni would be inducted into the Indian armed forces by 2002.[33] It is reported that the Government of India has decided to develop ballistic missiles with a longer range than the presently developed versions of Agni.[34]

Table-I

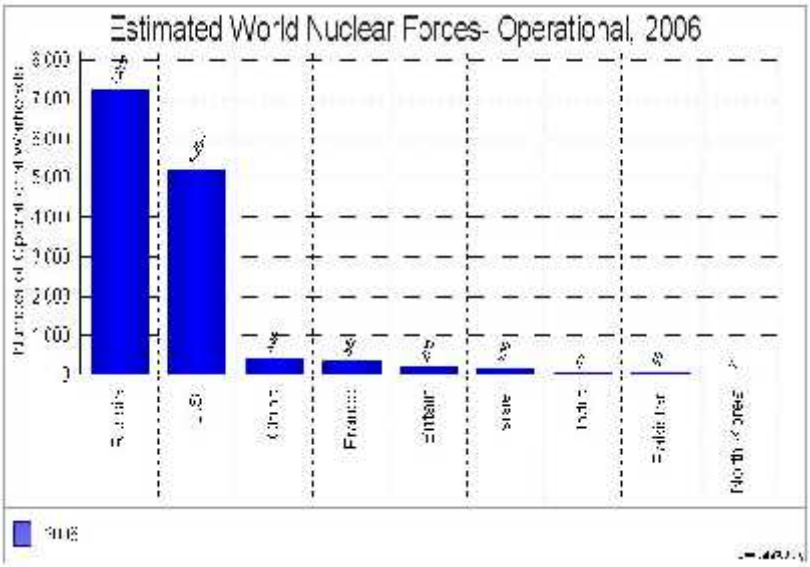
INDIAN BALLISTIC MISSILES

Missile	Type	Range (km)	Payload (kg)	Warhead	Propulsion	Guidance	Accuracy /CEP	Status
Prithvi – I	SRBM	150	1000	All	Liquid	Inertial	200m	Tested/D
Prithvi – II	SRBM	250	500	All	Liquid	Inertial	250	Tested/-
Prithvi – III	SRBM	350	500-700	-	Liquid	-	-	Tested
Agni – I	MRBM	1400	1000	All	Solid-Liquid	Inertial with terminal guidance	-	Tested/D
Agni – I	SRBM	700-750		All	Solid	-	-	Tested/D
Agni – II	MRBM	2000-2500	1000	All	Solid-liquid	Inertial with terminal guidance	-	Tested/D
Agni-III	IRBM	3700	?	All	Solid	-	-	Test plan stage
Agni-IV	ICBM	5000	?	All	Solid-cryogenic	-	-	Test plan stage
Surya	ICBM	12000-20000	?	-	Solid-cryogenic	-	-	Test plan stage
Brahmos	Cruise	280-290km		All		-	-	Tested/ND
Sagarika/Danush	SB	300-500	500	All	Liquid	-	-	-

Indian Nuclear Forces:

According to 2004 Indian MOD (Ministry of Defence) annual report, India had a stockpile of approximately 40-50 assembled nuclear warheads, but this number is likely to increase over the next decade. An unnamed MOD source told Defence News in late 2004 that in the 5 - to -7 years, India would have 300-400 nuclear and thermonuclear weapons distributed to air, sea, and land forces.[35] According to a recent estimate by the Institute of Peace and Conflict Studies (IPCS) in New Delhi, to maintain credible deterrence with China, India needs 425 nuclear warheads.[36] In the light of the Indian efforts to develop a strategic equilibrium with China, there is likelihood an increase in both fields of Indian nuclear forces: weapons and ballistic missiles. This will leave Pakistan to face a Hobson's choice: to upgrade minimum credible deterrence vis-à-vis India or accept the Indian strategic primacy in South Asia with attendant ramifications, something Pakistan has long rejected. A cautiously average account of many sources suggests that Indian now has an arsenal 50 deployed nuclear weapons.

Table-II



Indian Ballistic Missile Defence (BMD)

Indian BDM systems, though at various stages of development has the serious potential of undermining the efficacy of the PCMD. The table below indicates the type of system, its range, capability and status, which indicates their effectiveness against the corresponding Pakistani aircraft and missiles systems.

Table-III

Indian Ballistic Missile Defence (IBMD)

BMD System	Origin	Range	Capability	Status
S-300 SA 12 A SA 12 B	Russia	75 km 100km	Aircraft Limited effectiveness against TBM	Deployed
S-400	Russia		Aircraft Limited Effectiveness against SRBM, MRBM	Deployed
Antey-2500	Russia	200 km	8 IRBMs with 2500 km range or 16 TBM with 3000 km range	Unknown
Arrow 2	Israel	500 km	SRBM and MRBM	Uncertain
PAC-3	US		Cruise missiles, aircrafts, SRBM, MRBM	Under gotiation
Akash	India	27	Aircraft	Deployed

Source: This table is collated from a wide range of academic and internet sources.

Pakistan's Threat Perceptions and Strategic Objectives:

Pakistan's **strategic objectives** may be summarised as under: First, to institute a nuclear deterrent regime vis-à-vis India, and add strategic stability to the volatile South Asian deterrence, though this stability had been precarious at times, with India and Pakistan narrowly retreating from the brink of war in the dangerously escalating conflict scenarios, e.g., Kargil conflict in 1999 & 2001-2002 military confrontation. Second, to deter an all out conventional war between India and Pakistan, and contain

limited conflicts from intentional or inadvertent escalation.[37] Third, during conflict scenarios in 1990, 1999 and 2001-2002, the CMD ensured the maintenance of crisis stability and blocked it from degenerating into violent military hostilities and accidental spill over by imposing caution on the civilian and military leadership on both sides. Fourth, its purpose is to undercut the possibility of armed aggression against Pakistan's armed forces in any pre-emptive or preventive mode through a credible deterrence for assured punitive retaliation and debilitate the chances of even a remotely conceived advantage to the aggressor. Fifth, CMD needs to help create and maintain a strategic equilibrium in an otherwise highly asymmetric conventional military balance against an overwhelmingly large adversary in an increasingly difficult, intricate and rapidly changing environment. Sixth, it is believed to be the surest guarantee of safeguarding Pakistan's territorial integrity, national sovereignty and security of its people against external threats.[38] As a protective strategic equilibrium, it has successfully thwarted such threats to Pakistan's national security since the institution of the CMD. Finally, it has been psychologically reassuring to enable Pakistan to recover from the depressing aftermath of 1970-71 dismemberment, and enabled it play active in the surrounding regions and the wider international community.

Indian challenges to Pakistan's CMD posture are summarized as under:

- Growing Disparity of Strategic Forces and Asymmetry / imbalance
- Indian BMD.
- Lack of adequate second Strike Capability, especially Sea-based assets.
- Unreliable Strategic surveillance and Reconnaissance in due to lack of an advanced national satellite system.
- Less Early Warning.
- Technological disadvantages.
- Absence of Ready-response Capabilities.
- Relative Vulnerability of Strategic Air Bases and Ballistic Missiles.

- Intentional or inadvertent nuclear escalation / Escalation dominance.
- Challenges to Strategic / Deterrent / Crisis Stability
- Defensive Deterrent Posture

Pakistan and Credible Minimum Deterrence:

On 27 October 2007, Gen Kidwai stated at the Naval Postgraduate School, Monterey, that Pakistan has dealt with the formidable challenges by developing a nuclear policy based on restraint and responsibility with four salient features, (i) deterrence of all forms of external aggression, (ii) ability to deter a counterstrike against strategic assets, (iii) stabilization of strategic deterrence in South Asia, and (iv) conventional and strategic deterrence methods.[39] However, some of the challenges / threats to Pakistan's security demand a constant maintenance and augmentation of strategic weapons capabilities.

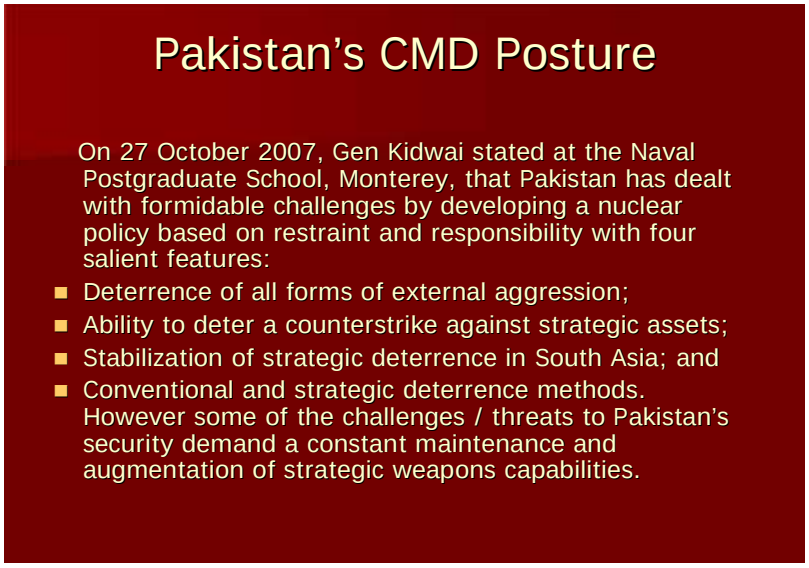
Describing the basic essential of CMD, Pakistan's former foreign minister stated: "More is unnecessary where little is enough."[40] Lt. Gen. Khalid Kidwai, however acknowledged that Pakistan's current nuclear strategy is defensive rather than aggressive, it is based on credible minimum deterrence, and driven by security concerns, not great power ambitions.[41] Kidwai further stated: "Additionally Pakistan faced difficulties due to the geographical and technological specifics in South Asia, including the ongoing military competition with India over the Line of Control in Kashmir, the lack of strategic depth and inadequacies of an assured second strike that made Pakistani strategic assets relatively vulnerable, and the inadequacy of real-time surveillance and early warning on both sides that make strategic miscalculations more likely."[42]

The general contingencies, which would warrant the threat or use of nuclear weapons, are described below:

- Threat from large conventional military asymmetries.

- Escalation from limited war / conflict
- Threat from Indian chemical weapons in a conventional conflict
- Intentional or inadvertent nuclear escalation / Escalation dominance.
- Strategic / Deterrent / Crisis Stability.
- Growing disparities in strategic equilibrium

Table-IV



The CMD is not only the officially proclaimed nuclear posture of Pakistan, but there is a general recognition within the domestic deterrent optimists lobby that credible minimum deterrence has been the most suitable policy under the prevailing strategic environment. Addressing a conference in Islamabad, Pakistan's Foreign Minister in General Pervaiz Musharraf's government declared in November 1999, "Minimum nuclear deterrent will remain the guiding principle of our nuclear strategy."[43] He stated that as India builds up its nuclear weapons arsenal: "Pakistan will have to maintain, preserve and upgrade its capability," in order to ensure survivability and credibility of the

nuclear deterrent.[44] Since then this theme has been consistently reiterated at relevant occasions by General Musharraf and his top advisers. This policy in fact dates back to Musharraf's regime. Responding to the pronouncement of draft Indian nuclear doctrine in August 1999 as "offensive, and threatening regional and global stability," the Defence Committee of the Cabinet (DCC) under the former Prime Minister Nawaz Sharif, stated that future development of Pakistan's nuclear weapons program will be "determined solely by the requirement of our minimum deterrent capability, which is now an indispensable part of our security doctrine."[45] Musharraf reiterated on March 6, 2003 that in nuclear matters numbers did not matter "beyond a point' and Pakistan has sufficient deterrence to take care of its security."[46] Musharraf further stated that Pakistan seeks peace in South Asia, but will not compromise on its minimum defence needs. He said Pakistan was not in pursuit of an arms race and maintained that consolidation of `minimum deterrence' was the cornerstone of Pakistan's security policy.[47]

As former Chief of Army Staff, General (Retd.) Mirza Aslam Beg went a step further to say, "as oxygen is basic to life and one does not debate its desirability, nuclear deterrence has assumed the life-saving property for Pakistan."[48] Indian analyst Giri Deshingkar suggests:

> "If for any reasons, India were to threaten the existence of Pakistan as a state as presently constituted, they are expected to use nuclear weapons against India first. With a doctrine of this kind, which can usefully be termed "Volatility", Pakistan would not be deterred by India's nuclear capability or even overt weaponization."[49]

Three senior Pakistani officials Abdul Sattar, Agha Shahi and Zulfiqar Ali Khan in a joint article contended that:

> Of course minimum cannot be defined in static numbers. In the absence of mutual restraints, the size of Pakistan's arsenal and its deployment pattern have to be adjusted toward off dangers of pre-emption and interception. Only then can deterrence remain efficacious." [50]

Pakistan has not given up its right of first-use of nuclear weapons, partly because it had no confidence in India no-first use declaration and partly because it is perceived to undermine its [nuclear] deterrence. Pakistan faced the ordeal of several wars and its dismemberment in 1971. It revealed that conventionally Pakistan could not deter India from crossing its borders. After acquiring the nuclear capability, Pakistan succeeded to thwart Indian forces from invading it in 1987, 1990, 1999, and 2001-2002 compound military crises.

It is quite obvious that given Pakistan's limited resource base and financial constraints, that minimum deterrence is the most cost-effective and pragmatic option for Pakistan. President Musharraf stated: 'Pakistan believes in maintaining a minimum credible deterrence and does not want to direct its available resources towards the race of weapons of mass destruction.' [51] An Indian analyst remarked: It is easier to build an effective command and control system if the nuclear arsenal is small, which suits to Pakistani conditions. [52] It is apparent that only a minimum deterrent posture can help avoid a ruinous nuclear arms race with India, and Islamabad is well aware that if a nuclear arms race were to eventuate, it would hurt Pakistan more than its larger neighbour India. Shamshad Ahmad, Pakistan's foreign secretary has echoed thoughts: "In South Asia nuclear deterrence may…usher in an era of durable peace between Pakistan and India, providing the requisite incentives for resolving all outstanding issues, especially Jammu and Kashmir."[53] Musharraf has referred to Pakistan's nuclear achievements in the same vein. In a speech delivered on March 27, 2001, on the retirement of A.Q. Khan, he said, "In a general sea of disappointment, the development of Pakistan's nuclear capability is a unique national success story."[54] Acknowledging Pakistan's achievements in developing its credible minimum deterrence, Brahma Chellaney observed:

> The rapid technological advances by Pakistan in recent years are a symbol of nationalistic pride in a country which has overcome major political, technical, and industrial challenges to mount a program with a team of dedicated

> scientists. Pakistan is showing the world —as China did in the sixties —how a country with limited technical resources and a narrow industrial base can acquire nuclear weapons and ballistic missile capabilities by riding a wave of nationalism.[55]

The presence of nuclear weapons makes war less likely. Deterrent strategies induce caution and thus reduce the incidence of war.[56] For fear of escalation, nuclear states do not want to fight. A conventional war may escalate to a higher level of force, but in a nuclear world, one cannot afford to escalate to a level of force anywhere near the top, without risking its destruction.

Pakistan's Command and Control:

Command and control (C^2) is an arrangement of facilities, personnel, and procedures used in planning, directing and controlling military operations.[57] Any C^2 system must be able to convey the orders of the command hierarchy to military in any environment across the spectrum of conflict, no matter how simple or complex the orders might be.[58] Nuclear C^2 have assumed extraordinary significance in the contemporary era of "information revolution" and "information Warfare." Focus on C^2 system, and cyber and electronic warfare has introduced a comprehensive paradigm shift in war fighting, rendering the classical military deterrence obsolete. To be effective the nuclear C^2 system must evolve into a real time planning and dissemination system that will provide a truely survivable, redundant and flexible planning capability.

Pakistan faces a difficult choice in calibrating the operational dimensions of its command and control system: whether to opt for a centralized or delegative command and control system, which Peter Fever describes as, an "always / never dilemma."[59] Another dilemma of command and control accompanying nuclear arsenals is the optimization of two conflicting requirements. The first is the military one: to be prepared to ride out a surprise nuclear attack, however unlikely, and retain the ability to retaliate swiftly and

effectively. Second, there is the need to have a foolproof system that precludes the remotest possibility of unauthorised or accidental use. Military professionals know well that any system heavily biased towards the latter will be per force sluggish enough on the former. According to a US Congressional report published in November 2007, "Pakistan's nuclear weapons are not fully assembled. Warheads, detonators and missiles are stored separately, but there are contingency plans for quick assembly in the event of a national crisis."[60] While such a policy has its utility for safety and security of nuclear arsenal, and it provides a safety valve against unauthorized nuclear use, it undermines rapid response capability.

Given the lack of strategic depth, geographical proximity and concomitant less early warning time, the imperatives of maintaining a ready response capability, and a small nuclear force, Pakistan may have opted for a delegative command and control. Pakistan's lack of geographical depth makes its nuclear assets and command structure vulnerable to Indian pre-emptive or surprise air attack.[61] The difficulty of maintaining communications with mobile launchers and dispersed silos in the hardening area for the survivability of nuclear weapons also suggests the desirability of a delegative control system. Pakistan Armed forces have however maintained the legacy of centralized control. The delegative system is also prone to inadvertent use of nuclear weapons, which is a major concern is India and Pakistan. The overall Pakistani choice is an assertive / centralized command and controls system.

In February 2000, Pakistan spelled out its command and control structure dealing with nuclear weapons. It announced the setting up of a National Command Authority (NCA) to deal with nuclear weapons development, employment and C^4I^2. [62] Under the NCA is a newly set up Strategic Plans Division (SPD), which formulates planning to deal with C^2 of nuclear weapons. The NCA is chaired by the President of Pakistan and Prime Minister is its Vice-Chairman. Pakistan announced two special committees to deal with nuclear weapons issues: an Employment Control Committee and a Development Control Committee. Foreign Minister is the Deputy Chair of the Employment Control Committee, and the ministers for defence and interior, the CJCS (chairman Joint Chiefs

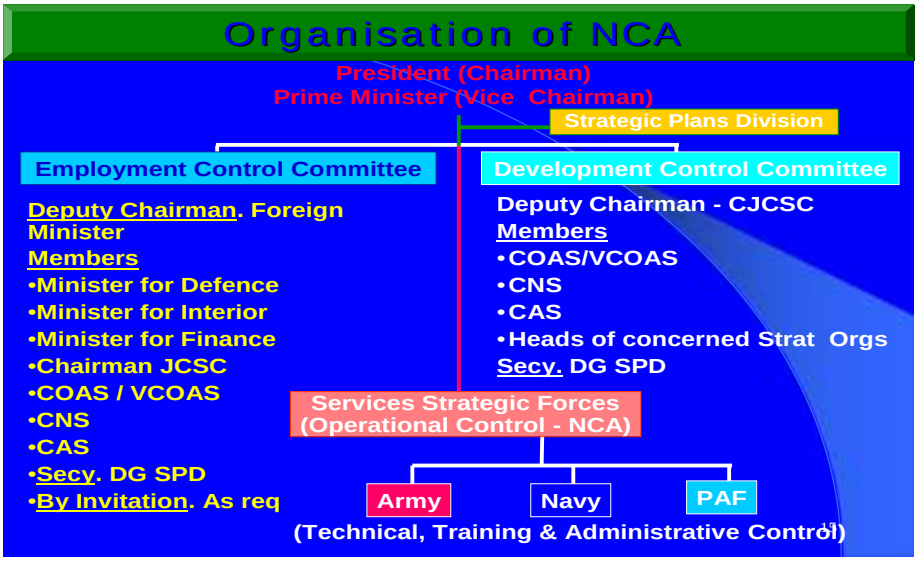
of Staff), three service chiefs and Director General SPD as its members. The Development Control Committee's Deputy Chair is CJCSC and has more or less similar membership, except that it is joined by the atomic bureaucracy, i.e., Head of the KRL (Kahuta Research Laboratories), Chairman PAEC (Pakistan Atomic Energy Commission), and Head of the NESCOM (National Engineering and Scientific Commission). The Employment Control Committee is a policy formulation organization regarding the employment of nuclear weapons in various contingencies. The identification of these contingencies is also the responsibility of the Employment Control Committee. The Development Control Committee deals with administrative policy about the development of nuclear weapons and missile systems. It is responsible for keeping the Pakistani nuclear deterrent in a credible state.

Pakistan's Command and Control Organization has three constituents, as described below.[63]

Table-V

National Command Authority (NCA)

- Constituent 1 – National Command Authority
- Constituent 2 – Strategic Plans Division
- Constituent 3 – Strategic Forces Command



Source: http://www.forisb.org/NCA.org)

Pakistan's Ballistic Missiles Capability:

Ballistic missiles are great **force multipliers** and Pakistan' ballistic missiles capability is the most potent dynamic of its nuclear deterrence to counterpoise the Indian conventional military and nuclear forces, especially missiles equipped with nuclear warheads. Although a late starter, like in the field of nuclear weapons, Pakistan has made great strides in the development of various category of ballistic and cruise missiles. Despite India's larger geographic and demographic size, greater financial and industrial resources, asymmetric conventional military forces and wider strategic depth, Pakistan has successfully achieved qualitative solutions to threat from India. Indeed, the issue of quantity versus quality guided Pakistan to seek indigenous technological alternatives and consequently turned her to developing its ballistic and cruise missiles, e.g. Shaheen, Babar and Ra'ad. Pakistan's drive to develop indigenous ballistic missiles capabilities enabled her to restore **strategic equilibrium** with India. Inaugurating the induction of Shaheen-I ballistic missiles in the Pakistan Army on March 6, 2003, the President of Pakistan reiterated that Pakistan sought peace in South Asia but emphasized the need to consolidate minimum deterrence as a cornerstone of Pakistan's security policy.[64]

MRBM Ghauri-I and IRBM Ghauri-II and III, once deployed will cover the entire Indian territory and India will lose the advantage of strategic depth, at least in terms of invulnerability and enhancing the threshold of unacceptable damage. MRBM Shaheen-I and IRBM Shaheen-II and III have highly advanced feature like terminal guidance, accuracy and speed to penetrate Indian BMD systems. Cruise missile Babar with stealth features can be launched from both ground, and sea, but its naval versions will enhance Pakistan's second-strike capability as well as penetration in the Indian strategic air defence systems, including BMD. ALCM Ra'ad, which also has stealth features, adds to Pakistan Air Force's nuclear strategic striking capability from a safe relatively safe distance, but still effectively engages counterforce and counter-value targets in southwestern India. **Ra'ad** is designed with stealth features. The missile has a very low detection probability due to its stealthy design and materials used in its construction. Ra'ad can carry all type of

warheads. Ra'ad will most likely be used for precision air strikes on enemy command centers, radars, surface to air missiles, ballistic missile launchers, stationary warships etc.

Hatf-II Abdali and Hatf-III Ghaznavi (SRBM) are suitable for battlefield deployment conventional military concentrations, .e.g. 1987 *Brasstacks* or the 2001-2002 largest ever Indian troops' mobilization against the Pakistani border. They can also engage counterforce targets along the border like large military-strategic establishments / air bases from where potential air and missile strike may be launched against Pakistan.

Pakistan's missile programme is India-specific and driven largely out of security concerns. It does not seem to aim at the augmentation of strategic power for a political rationale like a great-power status. Pakistan's missile programme is not a derivative of its space programme because it does not have a sufficiently developed space programme.[65] The development programme began in early 1980s. It was reported that on 25 April 1988, Pakistan for the first time claimed carrying out ballistic missile tests, which was confirmed by Gen. Aslam Beg in his National Defence College speech on 5 February 1989. Hatf-I and Hatf-II missiles were displayed at the Republic Day parade on 23 March 1989, which was interpreted as a great event in the history of the country. Since then Pakistan has rapidly developed different categories of highly advanced ballistic and cruise missiles, which form the foundation of its credible minimum deterrence posture. A table on the various types of Pakistani missiles is produced below.

Table-VI

Pakistan's Ballistic Missiles

Designation	Range	Payload	First test/ Status	Inventory	By
Hatf-I/IA (SRBM)	80/100 km	500 kg	Tested 1989 Deployed in1996	100+	KRL
Hatf-II	180-260 km?	500 kg	Tested 1989	Unknown	KRL

Abdali (SRBM)			Deployed, Under production		
Hatf-III Ghaznavi (SRBM)	290 – 300 km	500 kg	1997 Deployed	75- 100	? M-9, M-11?
Hatf-IV Shaheen-I (MRBM)	750 km	750 - 1000 kg	April 1999 Deployed, Under production	75?	NDC
Hatf-V Ghauri-I (MRBM)	1100 - 1500 km	700-1000 kg	April 1998 Deployed, Under production	100?	KRL
Hatf-VA Ghauri-II (MRBM)	2400 km, More range with lighter payload.	1000-1200 kg	1999 Operational, Under production	?	KRL
Hatf-VI Shaheen-II (IRBM)	2000-2500 km, More range with lighter payload.	1000+ kg	2004 Deployed, Under production	200+	NDC
Hatf-VII Babur (Cruise Missile)	700 km	500 kg	2005 Deployed	?	?
Hatf-VIII Ra'ad (ALCM)	300 km		2008 Tested	---	AWC-NESCOM
Ghauri-III (IRBM)	3,500+ km	1000+ kg	Under Development		
Shaheen-III (IRBM)	3,500+ km	1000+ kg	Under Development		
M-9 M-11 (SRBM)	300 km	500 kg	In service	Unknown	

Note: Not every missile has nuclear payload. This tabulation maynot be 100 % accurate given the diversity of sources material from which it has been prepared and the fact that some of the real data about such weapons systems always lies in the realm of secrecy, which government do not release for a variety of reasons.

Technological Challenges:

One sector in which Pakistan is far behind India is the development space technologies and satellite communications. Pakistan launched its first satellite Badr-1 in low earth orbit (LEO) by a Chinese Long March LM-2E rocket in July1990. Badr-1 provided the platform for Pakistan to develop satellite technology further. During December 2002, Pakistan deployed a communication satellite, PAKSAT-1 (geostationary orbit), as an interim solution to cater for communication needs. In order to implement an operational communication satellite programme, Pakistan's SUPARCO is presently conducting a detailed study towards the launch of a national communication satellite, PAKSAT-1R.[66] The existing PAKSAT-1 satellite is a third-hand satellite bought from Turkey at an initial cost of $ 4.5 million. Boeing originally developed this satellite for Indonesia. Turkey later bought it, and finally Pakistan purchased it and launched it. SUPARCO has established a satellite ground receiving station at Islamabad to acquire LANDSAT, SPOT, and NOAA data in real-time.[67] Pakistan's military dependence on space technologies is peacetime specific and the commissioned satellite inputs could only for military planning purposes and may not have much military utility other than their use for predicting meteorological conditions on the battlefield. According to available information, Pakistan is using LANDSAT, SPOT and NOAA images for civilian purposes. The military potential of such commercial satellites mainly depends on factors like optical resolution, spectrum, orbital features, sun-angle, and return time. For military reconnaissance purposes, satellite 'resolution' plays a major role towards providing quality input. Satellites with resolutions of 10 to 15 meters can provide useful information for strategic planning. Today, Pakistan receives SPOT images with a resolution of 10 meters or even less. At the same time, it should be kept in mind that the military utility of systems with resolutions of between 15 to 30 meters is limited. Such images do not have much significance at the tactical level. Hence, Pakistan's dependence on SPOT and LANDSAT may not be of much use during the actual operations phase. The very low-resolution images may not be sold during the war period or they may even be totally be blocked by the company. In addition, the Badr-II system does not

have a good resolution (approximately 250 meters). [68] DG SPD Lt. Gen Khalid Kidwai had stated that Pakistan and India both have "the inadequacy of real-time surveillance." [69] In this overall situation, the proposed launch of PAKSAT-1R may help Pakistan to improve its military communication network.

Deterrent Stability between India and Pakistan:

There is a near consensus among the deterrent optimists that a minimum deterrence regime is successfully working between India and Pakistan, though various descriptions of this deterrence differ from each other. The pre-1998 deterrence regime has been described as non-weaponized deterrence, recessed deterrence and existential deterrence.[70] For a stable non-weaponized deterrent regime, India and Pakistan refrained from assembling or deploying nuclear weapons and nuclear-capable ballistic missiles. With the May 1998 nuclear tests the non-weaponized deterrent regime is consigned to the dustbin of history.

The weaponization policies proclaimed to be followed after India - Pakistan nuclear tests in May 1999 and attendant doctrinal development has added transparency and enhanced deterrent stability, although at a higher level of threshold, and provided other essential pre-requisites of nuclear deterrence are fulfilled. These may include early warning systems, C^4I^2 networks, survivable weapons capabilities including second strike capabilities and credible delivery systems. [71] However, the present state of strategic stability between India and Pakistan is a precarious one, which needs a more constant monitoring and vigil than the former Cold war models. The geographical proximity between India and Pakistan does not permit enough early warning information and time: three to five (3 – 5) minutes at present, is inadequate for a rational and calculated response. This might prompt launch on warning responses enhancing the chances of miscalculation. The relatively less sophisticated command and control systems may cause difficulties to deal with problems of accidental and unauthorized launch of nuclear weapons. The increase in mistrust and hostility between India and Pakistan in the wake of the Kargil crisis and the unresolved Kashmir dispute compounds the problems of nuclear

arms competition, missiles proliferation and deployment and adds to divergent perceptions about strategic stability and regional security in South Asia.

Stability – Instability Paradox:

The central tenet of the stability – instability paradox is that offsetting nuclear weapons capabilities will maintain peace at the higher end of the conflict spectrum, while increasing tension at the lower end. A serious competition between states that possess nuclear weapons reinforces the caution of national leaders to avoid full-scale conventional or nuclear war, while increasing the instances of risk-taking below the threshold. Military balance is stable at the level of all-out conventional / nuclear war; it is instable at the lower levels of violence. The following are some of the dynamics of stability and instability between India and Pakistan. [72]

Dynamics of Stability

- Existence of tested / declared nuclear weapons capabilities.
- Dedicated ballistic missiles and aircraft delivery systems.
- Establishment of Command and Control systems.
- Formulation of nuclear doctrine / contingencies of employment of nuclear weapons.
- Development of 2nd strike capabilities.
- Limited Institution of S& CBMs.[73]

Dynamics of Instability

- Divergent political perceptions
- Existence of outstanding disputes, especially Kashmir.
- Existence of low-intensity conflict.

- Occasional outbreak of crisis and conflict-situations.
- Geographical proximity and less early warning time.
- Divergent perceptions about nuclear and security doctrines.
- Lack of dedicated hotlines between the top leadership and risk reduction mechanism.
- Ideological / Religious Diversity and Historical Antagonism.74

Additional challenges to the credible minimum deterrence:

Pakistani CMD is built around the notion of defensive deterrence. However, deterrence per se, being an ability to inflict unacceptable damage and thereby dissuade an adversary, by its very nature entails an aggressive intent without which it is difficult to establish deterrence. Unlike India, Pakistan does not have enough strategic depth to opt for an exclusively retaliatory deterrence and therefore cannot rule out first strike option. That first-strike option, in order to be credible to thwart any real and serious threat to Pakistan's integrity with no other viable alternative, has to be a massively debilitating strike, disabling Indian nuclear forces to retaliate. Any first-strike nuclear attack on India would be suicidal if Indian nuclear forces are destroyed, at least functionally if not physically, and some of their capability is left intact to retaliate, because in a retaliatory strike, India has large enough capability to deliver unrecoverable damage to Pakistan. However, it must be born in mind that complete decapitating nuclear strikes, especially against deployed and operationally ready nuclear forces, is an extremely dangerous impossibility and not tried in the nuclear history since 1945. That generates an imperative for Pakistan to augment its nuclear force: fissile material, advanced generation of nuclear weapons and ballistic missiles, and improve its satellite communications and surveillance. Whether it is achieved within the realm of CMD posture or through an expansion into a sufficient deterrence regime is inconsequential in the short-term. In the long-

term, say 5 to 8 years, as its capacities improve, Pakistan would be compelled by geo-strategic realities around the region, especially keeping in mind the pre-figured expansion of the Indian nuclear weapons and long-range ballistic missiles capabilities, to shift its CMD posture into a sufficient deterrence regime with an assured second-strike capability.

Non-Indian Challenges to PCMD:

Unlike India, Pakistan neither seeks a revision of the international power structure nor a place in it.[75] Pakistani decision-makers have demonstrated a *status quo* mindset, reconciled to a strategic subsistence. There is also a lack of initiative and ability to translate a strategic capability and deterrence into diplomatic influence.[76] It is equally essential that Pakistan must try to get out from the India-centric mode into a wider role in South West Asia to take advantages of the existing opportunities and face the emerging threats. There are current as well as new threats on the south-western horizon, like terrorism, and the safety and security of Pakistan's nuclear assets. Strategic defence of Pakistan's deterrent infrastructure is east-oriented, but prone to vulnerabilities from the south-west. There are numerous appearances in the Western and national press about the scenarios posing safety and security threats to Pakistani nuclear weapons and the U.S. contingencies of taking over control of Pakistani nuclear assets cloaked into a policy of saving them from falling into the terrorists' hands.[77] Despite the fact that Pakistan has a secure command and control system for its nuclear weapons capabilities and stringent measures about their safety and security, about which almost every visiting delegation from the U.S. and European Union is officially briefed, the tirade against the safety and security of Pakistani nuclear weapons is still persisting. There is a concerted campaign being forcefully re-engineered to de-legitimize Pakistan's *de facto* nuclear weapons status in the backdrop of its Muslim identity. It is reported that the internal security at Pakistan's nuclear storage sites is the responsibility of a 10,000-man security force commanded by a two-star general, and every member of the force is vetted through a PRP (Personnel Reliability Program). However, these measures do not

contain contingency against aerial or missile attack on the Pakistani nuclear assets from the westward and southward directions.

There are incessant reports and academic scenarios about the urgency of threats to Pakistani nuclear assets and that "the U.S. Special Forces snatch squads are on standby, awaiting orders to seize or disable Pakistan's nuclear arsenal in the event of a collapse of government authority or the outbreak of civil war in Pakistan."[78] It is reported that the snatch teams including volunteer scientists from America's Nuclear Emergency Search Team organization, are under orders to take control of an estimated 60 warheads located in six to 10 high-security Pakistani military bases.[79] The U.S. military sources leave no doubt that "contingency plans are being continually being reviewed and re-evaluated" to seize Pakistani atomic weapons if President Pervaiz Musharraf's administration is removed through the civil unrest, which has been underway in the year 2007. The report further suggests, "Members of the special forces are already believed to be nearby in neighboring Afghanistan and are on alert, awaiting orders to launch the mission. Satellite surveillance of Pakistan has also been heightened to keep track of the possible movement of nuclear weapons and missile delivery systems."[80] This raises a fundamental question: is the Pakistani government constantly moving its nuclear weapons to secure them from being captured by the so-called terrorists, or saving them from air attacks from any quarter as are being stipulated. Officially, the U.S. has frequently stated that it trusts Pakistan's military having its nuclear arsenal "under effective technical control", but Secretary of State Condoleezza Rice admitted if there was a radical Islamic coup, the US was "prepared to try to deal with it".[81] It is alleged that the U.S. diplomatic and military initiatives since 2001 have concentrated on trying to ensure that pro-western commanders were in charge at the most sensitive sites, and there has also been pressure to keep Pakistan's ISI intelligence agency, "thought to contain a number of high-ranking pro-Taliban supporters", out of the nuclear loop.[82]

These reports and scenarios warrant that Pakistan must develop contingency plans to preempt any strikes against its nuclear arsenal and assets, which might originate from Afghanistan either by India or by the United States, or may be jointly, no matter under

what pretext or rationale. The possibility of such preemptive strikes from the south and Arabian Gulf must not be discounted. Israel is often declared its hostile intentions against Pakistan's nuclear weapons capability, but by itself alone, it is not fully capable to decapitate Pakistani nuclear weapons capability. Given the Indo-Israeli military collaboration, the possibility, no matter how remote, cannot be discounted, and it demands a clearly planned and practiced military operation to thwart and neutralize, if and when, such threats materialize.

Author

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End Notes

1 Pakistan's strategic objectives to acquire nuclear weapons include the development of a protective equilibrium to neutralise threats to its national security; and to deter a large-scale conventional war or any other armed aggression in a pre-emptive or preventive mode against its armed forces. It also include to maintain an otherwise highly asymmetric conventional strategic equilibrium vis-à-vis India, to institute and maintain a nuclear deterrent regime in South Asia, and finally, to safeguard its territorial integrity, security of its people and its national sovereignty. A broader review of these objectives will be offered in the main body of the paper later.

2 It is believed that nuclear weapons are kept in separate storage sites and are not mounted on delivery systems during peacetime by Pakistan, and there are emergency procedures in place for their mating in crisis-situations.

3 According to Baylis and Booth, "Minimum Deterrence is an attempt to prevent enemy attack through reliance on a small nuclear retaliatory force capable of destroying a limited number of key targets." John Baylis and Ken Booth, eds., Contemporary Strategy Vol-1, (London: Croom Helm, 1987), p-312.

4 William T.R. Fox put it in following words: "When dealing with the absolute weapon arguments based on relative advantage lose their point." William T. R. Fox, "International Control of Atomic Weapons", in Bernard Brodie, ed., The Absolute Weapon (New York; Harcourt, Brace, 1946), p. 181.

5 Herbert F. Yark contended: To me minimum deterrence is minimal in two different senses: one in terms of its goals and other in terms of its means. In terms of goals, the purpose is to deter the use of nuclear weapons by someone

else and not something broader than that. In terms of means, minimum deterrence involves very small numbers. Herbert F. Yark, Arms and the Physicist (New York: American Physical Society, 1994), p. 273.

6 Kenneth Waltz, "The Spread of Nuclear Weapons: More May be Better, Adelphi Paper No. 171 (London: International Institute for Strategic Studies, 1981), pp. 5-6.

7 Gregory Giles,' Minimum Nuclear Deterrence Research, http://www.dtra.mil/documents/asco/publications/MinimumNuclearDeterrencePhase2.pdf. (accessed on 20 May 2008).

8 Naeem Salik, 'Minimum Deterrence and India Pakistan Nuclear Dialogue: Case Study of Pakistan,' http://www.centrovolta.it/landau/content/binary/MinimumdeterrenceandIndia-Pakistandialogie.Case Study Pakistan.pdf (accessed on May 10, 2008).

9 Ibid.

10 Yao Yunzhu, 'Chinese Nuclear Policy and the Future of Minimum Deterrence,' Strategic Insights, Volume IV, Issue 9 (September 2005).

11 India's foreign minister's speech in Parliament on December 16, 1998, http://www.meadev.gov.in

12 Lawrence freedman, 'The Rationale for Medium Sized Deterrence Forces,' in Christopher Bertram, ed., The Future of Strategic Deterrence (London, Macmillan Press Ltd, 1981), p. 49.

13 This view is expressed by one of my M. Phil student, Nasir Mahmood.

14 R. W. Jones, 'Minimum Nuclear Deterrence Postures in South Asia: An Overview,' Final Report, Defense Threat Reduction Agency Advanced Systems and Concepts Office, 2001, pp. 2-3, http://www.dtra.mi /ASCO/pubications/southasia.pdf

15 The succeeding pages of Indian nuclear doctrine have been adopted from my own work in the form of a forthcoming book on *Indian Nuclear Deterrence: Its Evolution and Development*, and partly in, "Command and Control Infrastructure: Operational Asymmetries and Dichotomies," a research Paper published in IPRI Journal, Volume II, Number II, Summer 2002, Islamabad – Pakistan.

16 Ibid.

17 Ibid.

18 Ibid.

19 Bharat Karnad, "Going Thermonuclear: Why, With What Forces, At What Cost, "Journal of United Services Institution, July – September 1998.

20 Ibid.

21 See footnote 15.

22 "Pakistan says Indian nuclear plan threaten global stability," The News, 26 August 1999.

23 Rodney W. Jones, "Pakistan's Nuclear Posture," Dawn (Karachi), September 14, 1999.

24 See footnotes 15.

[25] Please see footnote 15.
[26] Ibid.
[27] Ibid.
[28] Ibid.
[29] M. V. Ramana, "NUCLEAR ISSUES", *Frontline*, Volume 18 - Issue 25, Dec. 08 -21, 2001
[30] Bhavna Vij, "Minor embarrassment: Vajpayee cannot dial direct from his aircraft", *The Indian Express*, November 7, 2001.
[31] It is not intended here to provide a chronology of missiles development, but to highlight the threat the Indian ballistic missiles pose to the PCMD.
[32] P. R. Chari, "India's Slow-Motion Nuclear Deployment," *Proliferation Brief*, Vol. 3, No 26, September 7, 2000
[33] "Agni, Other Missiles to be Inducted by 2002", *Deccan Herald*, June 1, 2001.
[34] "Govt. Okays Longer-range Agni Missiles", *The Times of India*, June 1, 2001.
[35] Defence News, November 1, 2004.
[36] Ammara Khan, "Imbalance of Terror," *The Post*, Tuesday May 27, 2008.
[37] India was effectively deterred from horizontally escalating the Kargil conflict in 1999. She was also prevented from imposing a war on Pakistan during the 2001-2002 eye-ball-to-eye-ball confrontation despite her incessantly bellicose and combative posturing.
[38] Pakistani officials have described general contingencies, which would warrant the threat or use of nuclear weapons. For example, an Italian report based upon interview by Lt. General Khalid Kidwai, Director-General of the Strategic Plans Division (SDP) by a team of Italian researchers, describes some scenarios for Pakistan's employment of nuclear weapons. (Paolo Cotta-Ramusino and Maurizio Martellini, *Nuclear Safety, Nuclear Stability and Nuclear Strategy in Pakistan* (Como: Landau Network, January 2002). The interview-based report offers an analysis of Pakistan's nuclear posture and outlines contingencies under which Pakistan might resort to the threat or use of nuclear weapons. It states that Pakistan would resort to nuclear weapons' employment in the following eventualities: i) India attacks Pakistan and conquers a large part of its territory. ii) India destroys a large part of its either land or air forces. iii) India proceeds to the economic strangling of Pakistan. iv) India pushes Pakistan into political destabilization or creates a large-scale internal subversion. General Kidwai has later on denied that the use of wording of the contingencies. The stated contingencies are as under: (The wording of these thresholds is that of the Italian interviewers, Paolo Cotta-Ramusino and Maurizio Martellini, p. 5.
[39] The Director General of Pakistan's Strategic Plans Division (SPD), Lt. Gen. Khalid Kidwai presented a special guest lecture to the faculty, students, and guests of the Naval Postgraduate School on 27 October 2006. http://www.ccc.nps.navy.mil/news/kidwaiNov06.asp (assessed on 14 May, 2008). Lt. Gen. Kidwai provided a remarkably candid address on the

status of Pakistan's nuclear weapons program and the challenges it faces as a new nuclear power.

40. "The Nuclear Divide with the United States", The Muslim, November 28, 1992.
41 Ibid.
42 Ibid.
43 "Pakistan to upgrade nuclear deterrent," Dawn (Karachi), 25 November 1999.
44 Ibid.
45 "Pakistan says Indian nuclear plan threaten global stability," The News (Rawalpindi), August 26, 1999.
46 Muralidhar Reddy, "Pak. has sufficient deterrence: Musharraf," He was speaking at a function where the indigenously-produced Hatf-IV (Shaheen-I) medium range ballistic missile was handed over by the National Defence Complex to the Pakistan Army's Strategic Force Command. Shaheen-I, having a range of 750 km, can carry all types of warheads and is considered `highly accurate'.
47 Ibid.
48 General ® Mirza Aslam Beg, Development and Security: Thoughts and Reflections (Rawalpindi, FRIENDS, 1994), PP, 168-79.
49 Giri Deshingkar, "Indian politics and arms control: recent reversals and new reasons for optimism," in Eric Arnett, Nuclear *Weapons and Arms Control in South Asia after the Test Ban* (Oxford University Press, SIPRI, 1998), p. 32.
50 Agha Shahi, Zulfiqar Khan & Abdul Sattar, 'Securing Nuclear Peace,' The News (International), October 5, 1999.
51 Dawn, November 25, 1999.
52 Bhumitra Chakma , 'Pakistan's Nuclear Doctrine and Command and Control System: Dilemmas of Small Nuclear Forces in the Second Atomic Age', http://www.securitychallenges.org.au/SC/VolNo2/Chakma.pdf (assessed on 20 May, 2008)
53 Shamshad Ahmad, "The Nuclear Subcontinent: Bringing Stability to South Asia", Foreign Affairs, Vol. 78, No.4 (July/August 1999), p. 125.
54 Gordon Corera, Shopping for Bombs: Nuclear Proliferation, Global Insecurity and the Rise and Fall of the A.Q. Khan Network (New Delhi: Foundation Books,2006), p.150.
55 Brahma Chellaney, "South Asia 's Passage to Nuclear Power," International Security,vol.16,issue 1,1991, p.43.
56 Scott D. Sagan and Kenneth N. Waltz, The Spread of Nuclear Weapons: A Debate Renewed (New York: W.W. Norton, 2003), pp.33-35.
57 Shaun Gregory, Nuclear Command and Control in NATO (London, Macmillan, 1996), pp.3-4
58 Ibid.

[59] According to Peter Fever, "Leaders want a high assurance that weapons will always work when directed and a similar assurance that they will never be used in the absence of authorized direction,"[59] which are apparently contradictory objectives. (Peter D. Fever, "Command and Control in Emerging Nuclear States," International Security, Vol. 17, Winter 1992-93, p.163.

[60] U.S. Special Forces On Standby To Safeguard Pakistan Nuclear Arsenal, The **National Terror Alert** Response Center, December 30, 2007, http://www.nationalterroralert.com/updates/2007/12/30/us-special-forces-on-standby-to-safeguard-pakistan-nuclear -arsenal/, accessed on 10 July 2008 at 0135 hours.

[61] E. Arnett, 'Nuclear Stability and Arms Sales to India: Implications for U.S. Policy,' *Arms Control Today*,' Vol. 27, No. 5, 1997, pp. 7-11.

[62] Command, control, communications and computerization, and intelligence, Pakistan's Ministry of Foreign Affairs, November 13, 2002, available at: http://www.forisb.org/NCA.org.

[63] Pakistan's Ministry of Foreign Affairs, November 13, 2002, at: http://www.forisb.org/NCA.org

[64] Shaheen-I handed over to Army", The Nation, 7 March 2003.

[65] Space and Upper Atmosphere Research Committee (SUPARCO) was set up in September 1961.

[66] http://www.paksef.org/suparco.htm, Pakistan's second satellite, Badr-B/Badr-II, was launched on December 10, 2001, from the Baikonour Cosmodrome, Kazakhstan, on a Zenit-2 rocket with the cooperation of Russia. It was launched in a sun-synchronous orbit of 1,050 km altitude. The satellite is tracked from the TT&C Station at Lahore and has an expected life period of two to three years. Details of Badr-II are from http://www.suparco.gov.pk/sat_badr1.html, and http://www.fas.org/spp/guide/pakistan/earth.

[67] AJEY LELE, 'Pakistan's Space Capabilities,' Air Power Journal Vol. 2, No. 1, Spring 2005.

[68] http://www.au.af.mil/au/awc/awcgate/grayspc/graysat/surv.htm

[69] The Director General of Pakistan's Strategic Plans Division (SPD), Lt. Gen. Khalid Kidwai presented a special guest lecture to the faculty, students, and guests of the Naval Postgraduate School on 27 October 2006. Organized by the Center for Contemporary Conflict, Lt. Gen. Kidwai provided a remarkably candid address on the status of Pakistan's nuclear weapons program and the challenges it faces as a new nuclear power.

[70] The concept of non-Weaponized deterrence was proposed by George Perkovich, which recognized that India and Pakistan could retain nuclear weapons capabilities and fissile material, but remain short of manufacturing nuclear warheads. (George Perkovich, "Non-Weaponized Deterrence: The Case for Pakistan," *Strategic Studies*, Vol. XVII, Autumn – Winter 1994, Islamabad, pp. 142-46).

[71] Kenneth Waltz, *The Spread of Nuclear Weapons: More May Be Better* (London, International Institute for Strategic Studies, 1981), pp. 20-24).

[72] Zafar Iqbal Cheema, "Conflict, Crisis and Nuclear Stability in South Asia", SASSU Conference 2004, Bradford University, U.K. available at: www.sassu.org.uk/pdfs/Cheema.pdf

[73] Ibid.

[74] Ibid.

[75] India seeks a seat at the U.N. Security Council and other recognitions of a great-power status.

[76] "The task of a strategic doctrine is to translate power into policy". Henry Kissinger

[77] David Albright, Securing Pakistan's Nuclear Weapons Complex* By *Paper commissioned and sponsored by the Stanley Foundation for the 42nd Strategy for Peace Conference, Strategies for Regional Security (South Asia Working Group), Airlie Conference Center, Warrenton, Virginia, October 25-27, 2001, http://www.isis-online.org/publications/terrorism/Stanleypaper.html, accessed on 9 July 2008 at 2345 hours.

[78] U.S. Special Forces On Standby To Safeguard Pakistan Nuclear Arsenal, The **National Terror Alert** Response Center, December 30, 2007, http://www.nationalterroralert.com/updates/2007/12/30/us-special-forces-on-standby-to-safeguard-pakistan-nuclear -arsenal/, accessed on 10 July 2008 at 0135 hours.

[79] Ibid.

[80] Ibid.

[81] Ibid.

[82] Ibid.