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Introduction:

This report consists of a preliminary analysis of the military and nuclear escalation ladders of India and Pakistan on one hand, and of India vis-à-vis China on the other – the three geographically contiguous nuclear armed states in Asia. It seeks to assess these ladders as virtual realities, albeit evolving, of relations among the three nuclear-armed powers. It attempts to portray how they are perceived in terms of their deterrence properties, stability dynamics, and related risks of initiating armed conflict or escalating conflict to higher levels by the national actors concerned.

Since China's military intrusion into northeastern India in October 1962, India's conventional defense policies have included preparatory requirements for war simultaneously on two fronts – with Pakistan and China. Pakistan in contrast has viewed India historically as its main threat and prepares for war primarily with India. Today, however, the Taliban insurgency conditions in Afghanistan and the spread of similar conditions over recent years within western Pakistan itself poses for the first time the likelihood that Pakistan must also reckon with two front war contingencies if not requirements, albeit on a different scale.

Multiple opponents may add rungs to a country's escalation ladders and influence how national decision-makers expect to move up or down them, particularly when facing nuclear-armed opponents. Armed non-state actors and insurgents can impinge on state-to-state escalation ladders and demand refinements or precipitate ladders of their own. In major crises, geographical contiguity means the military escalation ladders of Asia's nuclear three could be linked in some forms of triangulation.

The underlying concerns of the analysis are that the persistent intensity of competition and recurrent military crises – especially in the India-Pakistan dyad – defy past understandings of what nuclear deterrence ordinarily can accomplish and elevate the risks of outbreak of war and potential for nuclear escalation. The crises also retard political and diplomatic measures of restraint and normalization of security relations, drive undue military and technological competition, or 'arms racing,' with its toll not only on ordinary economic and social development but also its technical enlargement and deepening of the catastrophic damage potential from wars that may erupt. The same competitive intensity arguably also enlivens clandestine exploitation of extremist organizations and the opponent's sub-national divides as available means of sub-conventional warfare, circumventing or subverting the conventional military defense mechanisms, applying

unpredictable pressures on decision-makers and their public constituencies, and rekindling or perpetuating deeply-embedded hostilities.

While tensions in the India-China relationship of recent years entail fewer emergencies, and China does not provoke in India the same volatile public emotions as Pakistan, and while positive trade and exchange activities also mitigate tension in India's relationship with China, the pattern could change for the worse. The deepening military and nuclear intimacy of China with Pakistan, Chinese sensitivities and growing military presence in Tibet, the unresolved Himalayan border disputes, the intrinsic maritime competition of the two "rising" big Asian powers for natural resources, and India's incremental, longer-range, nuclear ballistic missile development intended to cover China suggests that the bilateral military and nuclear relationship eventually may tighten – both on land, and at sea. This could crystallize recognition of reciprocal nuclear escalation ladders between the two Asian giants that have not been so apparent or active heretofore.

I. Classical Nuclear Escalation Ladder Constructs:

During the Cold War confrontation between the Superpowers, Herman Kahn gained some notoriety in American strategic circles by pushing the military envelope in *On Thermonuclear War* on "thinking about the unthinkable" (waging nuclear war)¹ and also – of immediate relevance here -- as the author of *On Escalation: Metaphors and Scenarios* set forth a 44-rung, "nuclear escalation ladder" construct (see, below, in Appendix A).²

Kahn's 44-rung nuclear escalation ladder construct proceeds upward from diplomatic actions and what he calls "subcrisis maneuvering" (rungs 1 to 3), at the bottom of the ladder, to demonstrations of force, signaling, acts of partial military mobilization, and legal as well as violent harassment actions under the rubric of "traditional crises" (rungs 4 to 9) – all still under the "*nuclear war is unthinkable*" threshold. The ladder rises through ten more rungs under the "intense crises" rubric, yet all still under the "*no-nuclear use threshold*". No-nuclear use rungs 10 to 20 of "intense crises" begin with breaking off diplomatic relations and rise through acts and declarations of limited conventional war, nuclear ultimatums, initial population evacuation measures, spectacular demonstration of force, "justifiable" counterforce attack, and embargo or blockade – all short of firing nuclear weapons, though presumably putting nuclear forces on alert (a rung not specified, but implicit in nuclear ultimatums) would have been done.

The remaining twenty-four rungs span the conduct of nuclear warfare from limited war to all-out nuclear war. The ladder moves in rungs 21 through 25 through demonstrative

¹ *On Thermonuclear War*, Princeton: Princeton University Press, 1960. Kahn was not an advocate of initiating nuclear war, of course, but rather of generating preparedness for response and other means of strengthening deterrence to preclude such a war. His graphic analyses forced strategists to think through hard choices about nuclear posture, doctrine and capabilities, and offered useful constructs aimed at crisis control over escalatory processes.

² *On Escalation: Metaphors and Scenarios*, N.Y.: Praeger, 1965. (Republished by Transaction Publishers, New Brunswick, N.J., 2010.

nuclear use and acts of limited nuclear war outside the main opponent's territory (in this Cold War context, nuclear actions by the US or NATO in Warsaw Pact Europe, North Korea, or other areas on the periphery of the USSR, but leaving the USSR itself "sanctuary"). The ladder continues on to breach the "central sanctuary" in rungs 26 to 31 with "exemplary central attacks" on specific targets in the main opponent's territory (demonstrative but still limited attacks on elements of the military, property, population), to include reprisals, but still short of "central war." Beyond that, the ladder breaches the "central war" threshold and rungs 32 to 38 consist primarily of "military central wars," i.e., counter-military and counter-force attacks of increasing scope, albeit still beneath a final "city targeting threshold" so that cities as such are not yet targets. Finally, the ladder goes through the "city targeting threshold" in rungs 39 through 44, continuing disarming attacks but with rising levels of counter-city and counter-value salvos through the final category of "spasm or insensate" war.

It should be noted that Kahn's treatise *On Escalation* and its ladder construct was formulated in the early 1960s when the "massive retaliation" strategic nuclear declaratory policy of the Eisenhower-Dulles years had gone out of fashion and NATO had risen and been strengthened to become a more formidable conventional blocking force – even though still outmatched numerically on the ground by its counterparts on the other side of the Iron Curtain. This was deemed compensated for by tactical nuclear weapons (TNW) or theater nuclear forces (TNF), and declaratory policies that allowed for the first use of TNW in response to surprise ground and air attack from the east. This was the period in which American strategic nuclear thought and policy were refocused on flexible response options and counter-force and counter-value distinctions were elaborated in war plans. Note also that Kahn's ladder construct does not itself distinguish resort to tactical and strategic nuclear weapons, or fission and thermonuclear weapons, as different rungs on the escalation ladder, although operational plans (the evolving SIOP and targeting databases) and other bodies of strategic military analysis of the time certainly took such distinctions into account, and they may be present in or emerging as factors in Asian nuclear war planning and escalation ladders.

Kahn's nuclear escalation ladder was focused on the bipolar strategic confrontation of the superpowers and their alliances during the Cold War, and not on third power nuclear relationships or escalation structures that might intersect, as is now prospectively possible in Asia. His escalation ladder construct was a heuristic concept for strategic thought and analysis -- a pedagogical tool to force clarification of potential issues of strategy and operations, but not a replica in any way of actual operational plans. By positing break points between rising and increasingly consequential levels of offensive military action, the escalation ladder offered tools to think through the contemporaneous political and military contexts of action and, by implication, to define where escalatory action could be arrested or controlled. Many American decision makers in high office – civilian and military -- were skeptical that controlling strategic nuclear escalation after the initial stages of nuclear war was really feasible but few could object to employing disciplined thought processes that offered to examine or war-game such possibilities, however theoretically. The nature of such analysis also contributed to understanding of the operational potential for damage limitation and offered insights into how nuclear

deterrence is made credible or more robust. The analytical use of escalation ladders was in no way inconsistent with pursuing first order deterrence objectives of forestalling the outbreak of “hot” military conflict, conventional as well as nuclear. While not invented specifically as a tool for arms control negotiations, the ladder analysis of escalatory potentials coupled with detailed knowledge of deployed strategic systems undoubtedly sharpened the de-escalatory and deep offensive force reduction objectives of such negotiations, especially in the final decade of the Cold War.

The more immediate purpose the nuclear escalation ladder construct serves here is to adapt its conceptual framework to decipher constructs that one may infer are being visualized by the decision makers and military planners in the political and military relationships of Pakistan with India, and India with China.

II. Basic Elements of Nuclear Escalation Ladders: the South Asian Theaters

For India and Pakistan, geography and demography, conventional military and nuclear force structures, and operational defense postures are key factors that would determine the basic rungs and thresholds on their nuclear escalation ladders. These factors are equally relevant to understanding India’s and China’s potential land-warfare ladders in the Himalayas.

A. Territorial Boundaries

India and Pakistan face each other across a common international border that loops along some 1,350 miles, as well as across the Line of Control (LOC) in disputed Jammu & Kashmir, a modified “cease-fire line,” that snakes north along another 460 miles. The militaries of the two countries thus deal with boundaries stretching between them for some 1,800 miles. India’s disputed boundaries with Pakistan in the north intersect with India’s disputed boundaries with China in Ladakh.

The boundary directly between India and China defined largely by the British-era McMahon Line (now referred to as the Line of Actual Control or LAC) runs through the Himalayas from Ladakh in Kashmir south and east for 2,100 miles, interrupted by Nepal and Bhutan, which have their own northern borders with China of 768 and 292 miles respectively. India considers the security of Nepal and Bhutan to be part of its sphere of interest and integral to its own defense against China. As a result, the virtual Himalayan boundary between India and China, from India’s point of view, actually spans a distance of some 3,160 miles. China disputes the legality of the McMahon line and occupied Aksai Chin in Ladakh (adjoining Kashmir and Tibet) while India holds, just east of Bhutan, the culturally Tibetan valley of Tawang and a large, non-Sinic, tribally-populated expanse further east that the British had designated as the Northeast Frontier Agency (NEFA) and which India has subsequently integrated as the state of Arunachal Pradesh. The brief Chinese military incursion into India in October-November 1962 was in this northeastern region.

B. The Mountains

India's and Pakistan's opposing defense structures and escalation ladders each involve potential warfare in the mountains (mainly in Kashmir), on the plains, and at sea. Each of these sectors deserves its own discussion. For instance, the escalatory rungs each has available would not likely all be the same in the mountains as on the plains or at sea. Somewhat different ladders may be applicable in each environment, though they likely would be linked if conflict begins in one and spreads to another (horizontal escalation, at least, but possibly vertical as well).

One key escalation ladder difference for conflict localized in the Himalayan mountain sector, for instance, at least for India and Pakistan, is that nuclear threats or resort to nuclear use specifically in the mountains against each other's forces seems highly improbable, for at least two reasons. First, the valleys of the areas in dispute are inhabited (it would alienate and probably displace peoples whose political support is needed). Second, targets of high military value that are also susceptible to nuclear attack would be scarce or non-existent. Offensive ground operations in the mountains are logistically cumbersome and slow-going, motorized equipment is channeled by terrain, and accessibility for heavy equipment is severely constrained. Defensive operations, if the infrastructure has been prepared, hold special advantages in the mountains. In short, use of nuclear weapons would seem to have no military utility for either India or Pakistan in the Kashmir context. (Note that in the India-China case and insofar as their land warfare could begin in the mountains, the same non-nuclear logic may apply today but not necessarily hold as tightly in the future, a point we will return to later.)

C. Sub-conventional Rungs

With respect to another issue, however, the reciprocal escalation ladders may have a common feature in each geographical environment. Both India and Pakistan have practiced sub-conventional warfare against each other in the past, a fact that should not be brushed aside, even if Pakistan's operations against India have been more prominent and become better known. Hence, beneath the conventional threshold, each may be considered to have sub-conventional rungs available, if not always active, that are applicable in the mountains, on the plains, and even at sea. India's conventional superiority in each of the three geographical environments means that it has far less incentive to activate or employ sub-conventional means – and in some scenarios could skip these rungs on their ladder, but the means exist. Arguably, it is the sub-conventional realm today that most drives nuclear risks in the India-Pakistan dyad.

India and China, however, do not appear to be engaged directly in sub-conventional warfare against each other. China fears potential Indian support for the Tibetan diaspora or people of Tibet itself in resisting the heavy weight of Han China, but evidently does not ascribe clandestine operations of this kind to India today. China may once have fished in troubled waters in tribal northeastern India, but has not been active in that way for decades. Nevertheless, if military tension heats up between them, such means are technically available. Should they be exercised in conflict, they could form lower rungs on nuclear escalation ladders.

D. The Plains

Of the three geographical environments between India and Pakistan, an escalating conflict that tests nuclear deterrence is most likely to take hold in the plains, even if it starts elsewhere as in the mountains. The geography and demography of the plains along the borders between India and Pakistan have important features that differentiate the Punjab sector from areas further south. The 1948 and 1965 armored battles in the plains were concentrated in Punjab. It held special strategic significance back then because the border runs near India's narrow landline access to Kashmir and also because the Punjab region around Lahore is considered Pakistan's cultural and political heartland. The Punjab sector is densely inhabited and relatively compact – stretching hardly 200 miles from the foot of the hills below Kashmir to the Punjab state border with Rajasthan on India's side, and just below where the Sutlej River bends more sharply west towards the city of Bahawalpur and the Indus beyond, inside Pakistan.

Punjab has been heavily defended since the early years. But today it is even more so. Named for five rivers that pass through, the region is also heavily irrigated; rivers and large canals are natural obstacles to rapid movement of armor and heavy equipment, especially in the face of air attack. Other obstacles have been built with time. Bunkers with anti-tank equipment abound. The boundaries in central Punjab can be and at times are profusely mined. Today, collateral damage is much harder to avoid than in 1965 because urban settlements have proliferated and expanded. Lahore city is only 20 miles from the border at Wagah and its urban sprawl has narrowed that distance. Amritsar, Jullundur and other urban areas are also prolific and close on the Indian side of the border. Former areas available for mechanized maneuver have greatly shrunk.

The rest of the plains stretching south along some 1,100 miles of border contain three other geographical segments. First, just beyond Punjab, is some 250 miles of arid and sparsely inhabited but relatively hard terrain in Rajasthan, suitable for rapid armor and mechanized or maneuver warfare, opposite Pakistan's narrowed lines of communication between its own provinces of Punjab to the north and Sindh to the south. This region was flagged as a logical invasion corridor for India to cut Pakistan in two, by India's then Chief of Army Staff, General K. Sundarji in the large area Army exercises known as "Brass Tacks" in 1985.

Second, further south, the Thar Desert crops up for some 400 miles, extending well into both countries. Most of it is almost uninhabited except for scattered nomads and their camels. Much of this area is less attractive (but not impossible) for mechanized ground warfare due to long logistic lines, intense heat, sandstorms and shifting sand dunes in which heavy equipment can get bogged down.

Finally, the third segment runs another 250 odd miles to the Arabian Sea coast, about 120 miles south of Karachi, Pakistan's main commercial port. On Pakistan's side, part of that segment is a continuation of the Thar Desert, and part marshy areas close to the coast. Just south of the border on India's side is the low-lying Rann of Kutch, swampy from

inundation by brackish water from the coast, and further south the rest of the state of Gujarat. This third segment is relevant, potentially, to combined ground, air and naval operations designed to blockade Pakistan from the sea.

E. Strategic Depth

A crucial geographic element of how conventional and nuclear escalation ladders would operate that needs separate discussion is strategic depth. In the India-China Himalayan land warfare case, since both countries are territorially large, it is safe to say that both also enjoy considerable strategic depth. Their estimates of what this means would differ in certain respects, however, particularly when the nuclear rungs of their escalation ladders are taken into account. While Indian territory stretches well to the south, India's densely populated heartland (Gangetic River basin), the capital at Delhi, and a considerable fraction of its industrial base is not very far south of the Himalayas. Moreover, the Arunachal area of India that China lays some claim to, and Assam, are connected to India territorially, north of Bangladesh, by the narrow, 25-kilometer wide Siliguri corridor, while the larger northeastern area of India has been fraught for decades with tribal insurgencies. From China's vantage point, its military infrastructure in Tibet lies in relatively sparsely populated regions while the more strategically sensitive Chinese heartland – particularly its larger cities and most of its industrial base -- are concentrated at considerable distances from India to the east.

For Pakistan the issue of strategic depth is much more severe, perhaps even agonizing for its military planners – especially today, with uncertainty about Afghanistan and as Indian conventional military modernization and international stature advances. This concern about strategic depth pervades Pakistan's contemporary military relationship with the United States on how to deal with the Pashtun insurgencies in Afghanistan and within Pakistan's own tribal areas, neutralizing which is regarded as a key to “stabilizing” Afghanistan. Pakistan's security establishment has its own strategy which in certain key respects is at odds with that of the United States and coalition operations in Afghanistan. Most of Pakistan's northern population in Punjab lives along or to the east of the Indus river, which flows south hardly 200 miles west, as the crow flies, from the Indian border near Amritsar, and the Khyber Pass entry to Afghanistan is just 100 miles further on a northwesterly angle. To the south, Pakistan's “green belt” narrows and its trunk lines of communication opposite Kishangarh in Rajasthan run as close as 40 miles from the border.

With this problem of narrow strategic depth in mind, Pakistani strategists believe not only do they require a “friendly” and “stable” state in Afghanistan on their western border, but that this can only be assured if Indian influence in Afghanistan is minimal. Pakistan's India-centric focus has led Pakistan to welcome China's security support since the 1960s, and that “all-weather” relationship has deepened over the years with major Chinese assistance in arms procurement and production, energy technology, telecommunications, and road and port infrastructure. Insurgency-related instability in western Pakistan increases Pakistan's dependency on China. This in turn tends to constrain Pakistan's capacity and readiness to seriously explore normalization of relations with India. While

only one of several factors, it seems likely that this current Pakistani preoccupation with insecurity to the rear (perceived as Indian encirclement) weighs on where Pakistan's nuclear threshold is placed on its escalation ladder with India.

F. The Maritime Environment

Conventional wars between India and Pakistan in the past have been limited in space and time and have caused relatively little collateral damage (with the partial exception of the 1971 war, in which there was a large population displacement into India and India's military action was strategically consequential in facilitating the separation of Pakistan's eastern province and creation of an independent Bangladesh). Most Indian and Pakistani planning for conventional war still assume that high-intensity warfare could not be sustained for more than a few weeks, due to likely shortages of petroleum, oil, and lubricants (POL). Both countries depend heavily on imports of these items, although stockpiling and storage are more advanced than in the past. Both are sensitive, however, to possible interruptions of energy flows from the Persian Gulf. Eruption of war between them could affect exports due to escalated insurance costs even without either side moving to blockade the other's ports, but blockades would likely deter or delay shipping. These then are areas of action that will also be found on their respective escalation ladders, but could these come close to the nuclear threshold? We will return to this question later.

India and China are embarked on building blue water naval capabilities and distant port facilities that could put them into maritime collision at some point. Their respective needs for imported energy and raw materials are growing, and lead to commercial activities far from their borders, but with passage through the Indian Ocean increasingly vital. The possibility of hot India-China conflict in the maritime domain raises longer term issues than those in the land warfare environment. The same is true of China's possible use of Gwadar port in Pakistan as a naval base. We will return to these questions later.

III. Force Structures and Operational Nuclear Postures – Rungs and Escalation Ladders

A. The India-Pakistan Dyad

In the Cold War experience with strategic and theater nuclear deterrence, the risks of nuclear exchange led to considerable superpower caution. American (or NATO) and Soviet (or Warsaw Pact) soldiers never came to blows. Direct conventional warfare between them was deliberately avoided on both sides. While there were occasional harassment episodes (including 'chest-bumping') between naval vessels of both sides on the high seas, ships of either side never fired on the other's ships. Combat fire against the other side's military aircraft was also scrupulously avoided, with the exception of Soviet surface to air missiles that brought down Gary Power's U-2 surveillance aircraft in 1960. Moreover, there were no armed clandestine operations launched by either side that attacked the other sides' military facilities or uniformed personnel. It became part of the shared understandings that open warfare between the two sides was too likely to escalate

to nuclear levels and should be avoided if at all possible. This contributed immeasurably, most believe, to the stability of mutual nuclear deterrence between the superpowers in that era. Nuclear deterrence seemed to be effective against offensive conventional attack at any level by either side in the central European theater and at sea or in the air anywhere. This did not, needless to say, curb superpower political-military competition and rivalry of other forms in other parts of the world – recruiting or arming allies, or in Moscow’s case, supporting armed revolutionary movements. But by fencing off direct conventional warfare in the central theater, it did reduce the immanent risk of either side starting up an escalation ladder of direct armed conflict.

This kind of understanding and practice does not seem to have taken hold fully in South Asia between India and Pakistan since both openly became nuclear-armed states in 1998, even though they are contiguous and each have among the world’s largest conventional armed forces facing each other across their shared borders. Their newly unveiled strategic nuclear deterrents did not preclude the outbreak or prosecution of the Kargil mini-war in Kashmir in the summer of 1999, nor preclude India from mobilizing for conventional war and sustaining the confrontation as a threat of such war against Pakistan in late 2001 through August 2002. The terrorist attack on Mumbai in November 2008 – known to have been planned and organized in Pakistani territory -- led to force alerts on both sides, but not the same level of brink-of-war confrontation.

In the meantime, however, India’s frustration with the Kargil war and the December 13, 2001 terrorist attack on India’s Parliament that precipitated the 2001-02 confrontation led senior officers of the Indian Army to articulate and advocate a Pakistan-centric theory of limited conventional war to develop options to punish Pakistan for what they believed was officially instigated sub-conventional warfare campaigns against India, both in Kashmir and in the heart of India. Those theories of limited conventional war have been converted into an Army “Cold Start” doctrine (now being talked about as “proactive defense” strategies) and field exercises to strike Pakistan quickly across the border to a limited depth, in reprisals that, theoretically, will be recognized by the Pakistani military as falling short of Pakistan’s “red lines” and thus below Pakistan’s nuclear threshold, not warranting a nuclear response.

While the Army’s Cold Start and proactive defense strategy options have not been given official blessing as policy by the elected government of India – the civilian leadership is not on the same page as the Army on this issue -- and have not been adopted as common doctrine by the Indian Air Force and Navy either, the Army’s efforts to advance these ideas in procurement and acquisitions, training and exercises as well as in joint doctrine with the other services continues. Thus, what persists between India and Pakistan is a dynamic that threatens the stability of nuclear deterrence as a means of deterring war. In effect, at least part of the military establishment in India seeks to make Pakistan aware that it is not deterred by Pakistan’s strategic nuclear deterrent from offensively waging limited conventional war and punitive strikes as a response to sub-conventional attacks. In so doing, the Indian Army, some believe, intends to call Pakistan’s nuclear resolve as a bluff. For advocates of Cold Start operations, the objective is to deter sub-conventional attacks by threat of conventional retaliation, and if that deterrence fails, to use available

opportunities to exact some attrition on Pakistani military forces and other exemplary targets of military or economic value. The ground force rungs on India's escalation ladder are not all solely defensive; some represent offensive, albeit presumably shallow strike, options.

The common elite and public belief in Pakistan is that the unveiling of its nuclear weapons in 1998 provided a reassuring deterrent against India's conventional military superiority and freedom to apply it aggressively against Pakistan. (Some circles in India share this understanding that Pakistan's nuclear weapons had an equalizing and stalemating effect.) Despite India's limited war debate, nuclear weapons are still thought to have made Pakistan much safer from the conventional Indian threat over the last 12 years. Leaders in the Pakistani strategic community point out that India threatened but did not resort to horizontal escalation in the Kargil War, threatened conventional war in the 2001-02 confrontation at two points (in January and May) but ultimately fell back from that course, and went on alert after the Mumbai terrorist attacks in November 2008 but did not mount a major new confrontation similar to 2001-02.

There is virtually no public discussion in Pakistan of other factors that may have contributed to Indian self-restraint (and that might lead one to question Pakistan's interpretation of the efficacy of its nuclear deterrence as the overriding factor). These would include the possibly indirect deterrent effects on Indian risk-taking of the limited US presence in Pakistan (established in 2001-02 to support the logistics of the coalition's overthrow of the Taliban and continuing counterinsurgency operations in Afghanistan), Musharraf's partial clamp-down on extremist organizations in Pakistan in 2002, the slowdown in the last decade of militant cross-border operations in Kashmir, and, finally, India's huge public relations gains in the international community from its restraint in and beyond Kargil.

Pakistan's security establishment has responded to India's Cold Start development in several ways. It knows that the Indian Army's practical efforts to reequip, reorganize, train, and prepare forward infrastructure for such operations has progressed relatively slowly, and that the concept was not been enthusiastically endorsed by the Air Force nor blessed as policy in New Delhi by the civilian powers that be. It is not uncommon to hear the view that India was bluffing in this sphere in 2001-02 and Pakistan stood up unflinchingly to its coercive diplomacy. At the same time, Pakistan's senior military do not completely write off these Indian concepts and demonstrative Army exercises but rather consider them an evolving, long term threat. They study them closely, use them for war gaming, and employ the worst case threats for public support and international sympathy for their typically India-centric views of Pakistan's military requirements. Pakistan's Chief of Army Staff, Ashfaq Kayani, sponsored a three-phased conventional military exercise in April-May, 2010 under the rubric Azm-e-Nau (New Resolve) to generate a response to India's Cold Start doctrine.³ These exercises are also said,

³ Arif Jamal, "Pakistan's Ongoing Azm-e-Nau-3 Military Exercises Define Strategic Priorities," *Terrorism Monitor*, Vol. 8, Issue 18, May 7, 2010. Available at: http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=36355

however, to have convinced the senior Pakistani leadership that Cold Start is a flawed concept and reassured them that the Army possesses effective counter-measures in anti-tank and air defense equipment using what might be described as swarm techniques to thwart shallow penetrations and pick apart integrated battle groups, should they actually materialize.

Pakistan may also be developing other measures to raise India's risks for starting any limited war action. These measures could signify a lowering its nuclear threshold, in one or more of three ways. First, there is a quiet internal debate and there have been informal indications for some time that Pakistan is developing tactical nuclear weapons (TNW) and could decide to pre-position them upon warning of a crisis at selected locations not far from the borders. If Pakistan does move down that path, we may judge for technical reasons – miniaturization for artillery and other battlefield type weapons is a challenge, and the fissile material inventory is growing but limited – that Pakistan would most likely rely on short-range ballistic missile and aircraft delivery of nuclear weapons configured for use in a tactical mode. This would, of course, add nuclear battlefield rungs to the escalation ladder and might lower the nuclear threshold to correspond. Second, Pakistan could alter its long-declared practice of keeping separate the nuclear and trigger components of warheads as well as the delivery systems on which they would be loaded or mated, in favor of enhanced readiness, albeit with other risks or tradeoffs. Pakistan could possibly also shorten the timelines between nuclear alert, weapons assembly, dispersal and a state of combat readiness for certain systems.

B. India's Escalation Ladder vs. Pakistan – the Rungs Assembled

Figure 1, below, depicts the “Indian Escalation Ladder – Facing Pakistan,” as a synthesis of the observations thus far, together with what is known or can be inferred from public data about India's operational postures, conventional and nuclear. With 19 rungs, it is a simpler escalation ladder than Herman Kahn's 44-rung Cold War superpower construct, but is thematically similar in construction, with pre-war, conventional, pre-nuclear, and nuclear war thresholds. The four columns in Figure 1 under the “context and probability estimate” heading – representing ‘peacetime’, ‘military crisis’, ‘terrorist attack’, and ‘war outbreak’ scenarios, are not in Kahn's model and are offered as one way of elaborating on how the state's escalation options (India, in this Figure 1 case) can be visualized in the actual theater, given the pattern of bilateral crises and conflicts India and Pakistan have experienced in the past along with contextual circumstances at the time. The probability estimates (rough orders of magnitude) are the author's intuitive views of the likelihood of a state (India in this case) being forced at the rung it is on to examine and decide whether to climb to the next rung on the escalation ladder, or not.⁴ *Note: These probability estimates are not estimates of the probability that a state (India in this case) will necessarily execute the next higher rung on the escalation ladder.* Developing probability estimates of the likelihood of a state moving up from one rung to the next is an exercise

⁴ The probability estimates given are based on this author's knowledge of developments in the region, enhanced by recent field interviews in both countries with military practitioners and security experts.

that requires interactive analysis of opposing escalation ladders, and that exceeded the time and resources available for this project.

Fig. 1. Indian Escalation Ladder - Facing Pakistan

Rung Order	Response or Initiative Thresholds and Rungs	Context and Probability Estimate			
		Peace	Military Crisis	Terrorist Attack	War in Progress
19	All out counter-value strike (response)		ongoing		>20
18	Strategic counter-military strike (response)			lost	>30
17	Proportional retaliation (response) vs. TNW			in	>95
16	Demonstrative nuclear weapon use (response)			the	<50
	No Nuclear Use Threshold			noise	
15	Conventional air campaign vs bases and airfields			<30	>50
14	Initiate major war to cripple Pakistani forces			<15	<40
13	Full nuclear alert (wpns assembly and transfer)			10	>80
12	Complete full mobilization, all services			<30	100
	No Major Conventional War Threshold				
11	Initiate full range of 'shallow' Cold Start options		ongoing		>75
10	Implement limited subset of Cold Start options		<5	>25	>90
9	Precautionary nuclear alert (no transfer)		<10	>50	>90
8	Ultimatum for Cold Start operations		>40	>10	>60
7	Initiate ground and air force mobilization		30	>50	100
	No Conventional War Threshold		>95	>30	
6	Subconventional (covert) offensive campaign in heart of Pakistan	<10	0	>30	
5	Subconventional (covert) offensive campaign in Kashmir	>30	<5	>60	
4	Subconventional (covert) retaliation	<20	<5	>50	
	No "Hot" Warfare Threshold				
3	Selective areas of military mobilization	<5	>60	<5	
2	Military signalling (tests, exercises)	<20	>35	0	
1	Pre-crisis maneuvering, gestures, diplomacy	12	>75	>25	
	Disagreement - Pol-Mil Rivalry				

The depiction in Figure 1 of the Indian escalation ladder differs from Herman Kahn's model by explicitly incorporating rungs of sub-conventional action. It also reflects the possibility that Indian escalation from one rung to another may be either a measured response (reaction) to an action by Pakistan or a consciously escalatory initiative (proactive measure), e.g., intended to gain escalation dominance, although in a real two-way escalatory process the motivations underlying such a distinction may be difficult to track empirically. It is relevant heuristically, however, to imagining whether and at what point a state's decision-makers could settle on a stopping point in the escalatory process. Their freedom to do so, of course, will be contingent on many variables, not least the reaction of the opponent and its effects on the contest in progress.

Not surprisingly, the numerical estimates here on certain rungs of the Indian escalation ladder suggest significant probabilities of being faced with decisions whether to resort to Cold Start types of operations – moving up the ladder past the “no conventional war” threshold to rungs of “limited conventional war” – during military crises. The probabilities that decisions will be made to escalate to higher rungs of Cold Start-type operations could be expected to become very high in the wake of high-casualty terrorist attacks or amidst the outbreak of any level of conventional war. They may also be influenced by what external powers, regional allies, or other regional opponents are doing in that same context – although third party actions are deemed too complex to map in this ladder construct.

The estimates in Figure 1 suggest that terrorist attacks by themselves would not have a pronounced impact in forcing review or decision on Indian nuclear alert levels; the probability is low that such attacks would cause India to assemble nuclear weapons and put them in military hands for a high state of nuclear combat readiness. On the other hand, the numbers suggest a very high probability of India considering a decision to go to full nuclear alert levels and assembly and transfer of nuclear weapons to military custody after the outbreak of conventional war, even limited conventional war initiated by India, but particularly in the event of a major conventional war. This judgment tends to run counter to a common view of India's supposedly recessed nuclear deterrent as a relaxed posture that would not need to be activated save in the event of a prior nuclear (or other WMD) attack on India or on its military forces.⁵

The rungs depicted on India's escalation ladder here reflect skepticism of the credibility of India's actually executing its 2003 amended declaratory policy (so-called doctrine) on nuclear weapons, which calls for “massive retaliation” against the perpetrator of any nuclear (or WMD) attack on India or its military forces, including such attacks on those deployed or operating outside India's borders. The intermediate rungs depicted here are meant to suggest that India would be much more likely to consider and respond to limited Pakistani nuclear attack in a proportional (and thus initially limited) way rather than to escalate immediately to the top of the ladder with large strategic counterforce strikes let alone massive city and countervalue strikes. At the same time, the figures presented still admit a significant chance of India considering the option of massive nuclear retaliation,

⁵ Note that there is ample wiggle room in this posture. Arguably, India's NFU declaratory posture would evaporate instantly with any nuclear use by the opponent, even as limited as a demonstration shot.

ultimately, in the event of a major conventional war compounded by any escalation to strategic nuclear exchange warfare.

Bear in mind that this Indian escalation ladder as well as those of Pakistan, and of India versus China presented below, are heuristic constructs imagined to clarify the potential nature of the escalatory process under, and up through, nuclear warfare conditions. Their approximation of reality can be improved by discussion and further study and analysis. They obviously do not represent the skeletal structure of actual war plans nor can they begin to capture the variety of operational alternatives. Their value is in prodding a clearer, policy-oriented understanding of the conditions of escalation and factors that might be used as controls and as escalatory preventative mechanisms. They can also be useful for generating constructs for negotiated threat reduction and arms control.

C. Pakistan's Escalation Ladder vs. India

Pakistan's escalation ladder depicted below in Figure 2 is not a mirror image of India's but closely follows it in certain respects since the bulk of Pakistani war planning centers on its assessment of Indian capabilities and what it learns over time about Indian military doctrine and planning. Pakistan's operational nuclear posture currently emphasizes holding hostage value targets deep in Indian territory by the potential launch of nuclear-equipped, mobile ballistic missiles, along with the selective use of nuclear-equipped strike aircraft and land-attack cruise missiles that are still in development. This clearly is a deterrent against Indian nuclear surprise attack on Pakistan out of the blue, though few believe India would actually contemplate that scenario in foreseeable conditions. While unequal to India's, Pakistan also possesses formidable conventional ground forces and a respectable air force that are intended to provide "conventional deterrence" against India planning a major conventional war against Pakistan. The conventional deterrent value of those forces is surely significant in its own right in today's circumstances, even with the diversion of effort to contain the current insurgency in the Pashtun borderland to Pakistan's rear.

The primary dilemma seen in Pakistan's strategic nuclear posture is whether it can make nuclear deterrence effective against (i.e., essentially neutralize) India's unilateral threat to initiate conventional ground, air force and naval capabilities in offensive modes against Pakistan, in limited, punitive warfare in response to high casualty terrorist attacks in its interior, as postured in India's Cold Start and proactive defense strategies planning. If it can not, and the Indian Army at least signals that it is not itself necessarily so deterred by Pakistan's strategic nuclear deterrent, then Pakistani strategists may fear India would take advantage of further conventional escalation during hostilities to pursue more fundamental goals, incrementally, such as to ravage Pakistan's conventional warfighting capabilities, threaten its strategic assets by conventional air attack, or, ultimately, even attempt to break the country into pieces. These are worst case scenarios, of course, and so understood by Pakistani planners, but their image of the rolling snowball gathering size and momentum cannot be totally dismissed. It is their views, not those of outsiders, that will matter in a showdown.

Fig. 2. Pakistani Escalation Ladder - Facing India

Rung Order	Response or Initiative	Context and Probability Estimate			
		Peace	Military Crisis	Terrorist Attack	War in Progress
18	All out counter-value strike		ongoing		>20
17	Strategic counter-military strike				>30
16	TNW employment vs. Indian ground forces				>95
15	Nuclear limited action vs. naval blockade			lost in	>30
14	Covert nuclear employment at sea			in	>50
13	Demonstrative nuclear weapon use				>75
No Nuclear Use Threshold					
12	Selective counter-military air strikes			the noise	>50
11	Full nuclear alert (wpons assembly and transfer)				>80
10	Complete full mobilization, all services				100
No Major Conventional War Threshold					
9	Blocking, limited escalation vs. Cold Start		ongoing	>50	>90
8	Precautionary nuclear alert (no transfer)		>40	>10	>90
7	Prepositioning to counter Cold Start options		>60	>50	100
6	Initiate ground and air force mobilization		>95	>30	100
No Conventional War Threshold					
5	Subconventional (covert) offensive campaign in heart of India	<10	0	>30	
4	Resumption of (covert) offensive campaign in Kashmir	>10	>50	>60	
No "Hot" Warfare Threshold					
3	Selective areas of military mobilization	15	>60	>35	
2	Military signalling (tests, exercises)	25	>50	0	
1	Pre-crisis maneuvering, gestures, diplomacy	>50	>75	15	
Disagreement - Pol-Mil Rivalry					

Until a year or two ago, Pakistani military leaders (as well as their Indian counterparts) sensibly dismissed any need for, and therefore serious consideration of, reinforcing conventional forces with tactical nuclear assets and operations. The results of Pakistan's Azm-e-Nau exercises even now suggest that Pakistan's conventional response to actual Indian Cold Start intrusions would block or neutralize them. But this still means Pakistan could be forced into intense conventional warfighting, and it reveals the perceived weakness of its conventional (and nuclear) defense posture in effectively deterring actions that would precipitate that fight. In this light, informal indications that Pakistan is

considering not only a tightening up of nuclear preparatory procedures but adoption of some TNW capability may have to be taken seriously as a possible augmentation of battlefield operations in the war in the plains environment, and possibly also in a maritime setting. This is considered here, therefore, as a likely differentiating feature of Pakistan's escalation ladder from India's in the near term.

Figure 2 suggests that Pakistan would be somewhat cautious during military crises in pursuing (or allowing) major sub-conventional actions against the heart of India, but probably would be inclined to consider stepping up such efforts in Kashmir and the Indian interior if attacked in a similarly sub-conventional manner by India, particularly when there are signs conventional war is expected to break out. At the bottom of the ladder (pre-war threshold), the numbers suggest Pakistan might be more energetic in its diplomatic efforts than India – although the focus might well be more on enlisting international attention than reaching a political solution directly with India.

Between the lower threshold of “no conventional war” and that above it of “no *major* conventional war,” the ladder's rungs reflect engagement in limited conventional warfare. The specific rungs and their associated probability figures for Pakistan are intended to indicate that its options of military action at this level could involve intense but limited responses well below its own nuclear threshold. These options include escalatory reprisal designed to nullify the military effects of India's initiatives. If limited conventional war escalates in reciprocal actions to major conventional war, however, while Pakistan has a very strong defensive capability and short lines of logistical support in Punjab, the ladder suggests Pakistan has fewer non-nuclear response rungs (less space, shorter time) to counter the opponent's forces, or be able to sustain its own blocking effort, if major conventional warfare continues, and especially if it goes all-out (e.g., a “fight to the finish”).

Above the nuclear use threshold, the ladder suggests Pakistan is likely to visualize, conceive and perhaps operationalize a few more rungs of “flexible response” than India, moving in degrees from nuclear warnings (demonstration shots) to limited nuclear action, with some options at sea, and the main one on land being the exercise of tactical nuclear weapons against ground forces, either on the battlefield or to the rear to interdict Indian logistics and support facilities. Reaching this level presumes conventional warfare has begun, is continuing, and being intensified. Flexible nuclear response rungs would reflect judgments that Pakistani leaders, pressed hard, may believe they would have space to maneuver with TNW operations between India's offensive conventional operations and India's resort to massive retaliation as a strategic measure. Indian recognition of this kind of Pakistani planning ahead of time could enhance Pakistan's overall deterrence of India executing its limited conventional war strategies. When push comes to shove, this may be a plausible analytical judgment, but the underlying TNW trend surely poses heavy risks to both Pakistan and India. There is no way to be sure once nuclear weapons are actually being fired on forces in the field that the nuclear escalatory process will be stopped. It would almost require that one side stand down peremptorily.

Separate excursions to determine whether the Chinese military relationship with Pakistan influences Pakistan's escalation ladder with India or Indian views of its own deterrence and escalatory options opposite Pakistan are warranted, but are not likely to offer very definitive results from reviewing past experience. The main effect of the China relationship on Pakistan's ladder today probably is a higher level of Pakistani confidence and resilience in face of India's military modernization and experimentation with limited war concepts and future advanced technology solutions in surveillance and missile defense against Indian progress in those fields.

China's military relationship with Pakistan has been extensive and multi-dimensional in the category of arms supply, which does much to enable Pakistan's robust ground forces, sustain modernization of air force combat and air defense capabilities. Missile supply and transferred missile production capabilities clearly helped underwrite Pakistan's nuclear delivery capabilities and thus its strategic deterrent against India. China also provides positive political, technical and financial support of Pakistan's political and economic development priorities – and is forgiving of domestic political instability in Pakistan as long as it is not linked with Uighur dissident groups in Xinjiang province in western China or threatening to Chinese workers in Pakistan. China also has a stake in its bilateral resolution with Pakistan of formerly disputed territorial boundaries between the Northern Territories of former Jammu & Kashmir.

Although increasingly close and described as an “all weather relationship”, China thus far has not signed anything resembling a classical mutual defense treaty with Pakistan,⁶ nor ever offered direct military support to Pakistan in the recurring conflicts with India, not even in the 1971 War just south of its Himalayan borders with India (not far from where China invaded Indian territory in 1962). During the brief Kargil War, all evidence suggests that China advised Pakistan to withdraw from the conflict rather than attempt to pursue any advantageous military outcome. China put no specific diplomatic pressure on India as a favor to Pakistan during the ten months-long 2001-02 confrontation. China has also kept its relationship with Pakistan hands off and deferential with respect to the linked insurgencies in Afghanistan and Pakistan.

Pakistan's emerging two-front war problem is insurgency-related and unlikely to exceed the dimensions of a low-intensity conflict in the foreseeable future. Afghanistan is also very unlikely itself to present a state-to-state, modern, mechanized warfare threat to Pakistan in any foreseeable future. A formal depiction of a separate escalation ladder for

⁶ In April 2005, Pakistan and China signed a “Treaty of Friendship, Cooperation and Good-Neighborly Relations” that went into effect on January 4, 2006. The main defense-related obligation in this treaty is for each side to refrain from “joining any alliance or bloc which infringes upon the sovereignty, security and territorial integrity of the other side”. The treaty's terms link Pakistan formally to China's “one China” policy vis-à-vis Taiwan. The parties also undertake to “cooperate on both bilateral and multilateral basis to crack down on terrorism, separatism and extremism, as well as ... organized crimes, illegal immigration and illegal trafficking in drugs and weapons.” China has referred to it as “an important legal foundation for the Strategic Partnership.” The text of the treaty has not officially been made public in Pakistan, although some newspaper reports have quoted excerpts from it taken from the Chinese press. For Chinese publication of the treaty text, see *People's Daily Online*, at http://english.peopledaily.com.cn/200504/06/eng20050406_179629.html

Pakistan on these issues probably would not uncover any startling new ideas. In general, the insurgencies tend to deprive Pakistan of what former COAS General Mirza Aslam Beg first sponsored as a vision of a friendly (or subordinate) Afghanistan in Pakistan's back yard that would part of Pakistan's "sphere of influence" and a reservoir of strategic depth. For the near term, the "Pakistani" Taliban insurgency also strains Pakistan by diverting roughly 100,000 regular military personnel (added to the 30,000 Frontier Corps, a paramilitary) from their normal stations close to the eastern border with India. There is also some diversion of Army helicopters and, for brief intervals, even Air Force F-16s to cover targets with precision weapons or provide close air support in battles against insurgents. This definitely adds stress to Pakistan's India-centered escalation ladder by reducing the margins for error of conventional ground operations. It certainly is one of the factors that has made US-Pakistan security cooperation particularly brittle over the last three or four years.

Beyond that, what has attracted some attention and is worthy of mention is the geographical fact that the domestic instability that radiates outward from the insurgency in Pakistan's northwest constrains the security and utility of the natural concealment available in the rising terrain of that hilly region to the west of the Indus River, for the deployment of fixed and dispersal of mobile strategic assets, since they could be (at least theoretically) penetrated or overrun by insurgent and extremist organizations. Al Qaeda or Taliban seizure of nuclear weapons from Pakistan's tightly organized command and control system may be a remote scenario, but not one that the Pakistani military or its friends can leave to chance. Nor is this overlooked as a shared regional concern in India, and as an unstated additional cause for its own restraint vis-à-vis Pakistan -- at least at the top level of elected political leadership.

D. The China-India Dyad

The Indian strategic community has since 1962 viewed India's relationship with China in geopolitical and competitive terms. China's advent as a nuclear weapons state after 1964 added a nuclear dimension that the Indian elite foresaw and responded to in stages, developing its own nuclear weapons capability and delivery systems, seen in retrospect as a relatively gradual pace over nearly five decades. As China first around 1975, and India later about 1991 (coinciding with the end of the Cold War) began their economic "rise" as big powers in Asia, the sense of competition has sharpened. On a bilateral and strategic level, India feels this more intensely than China, which has had to contend geopolitically and strategically with the former Soviet Union (now Russia), Japan, and the United States.

Until relatively recently, China appears to have regarded India strategically as a third order concern, rather than a high priority. China has given a more strategic importance to India only since the turn of the century, roughly correlated with its growing commercial maritime dependence on distant sources of petroleum and minerals, especially in the Middle East and Africa, but also more recently in Latin America. India's nuclear break out in 1998 may have been an added factor, but probably not a driving one. The growing U.S. interest in India over three administrations also played a part. China's reach for oil,

gas, and minerals has not been exclusively maritime but has also gone over land, and resulted in successful oil and gas pipelines connecting Central Asia to western China in the last three years. Nevertheless, the bulk carriage on maritime routes remains crucial. India's geographical position which can influence the security of these routes from China's littoral on the Pacific Ocean past Singapore and the Malacca Straits, and onward through the Indian Ocean to Africa and the Persian Gulf, gives India potential naval leverage that China would be foolish to ignore. China has also encouraged a rapidly growing and mutually beneficial trade relationship with India, with a total value reaching about \$60 Billion in 2010, so their relationship has important cooperative dimensions, and is not overwhelmingly zero-sum. Both have worked to tamp down bilateral issues of potential confrontation.

That said, both India and China are pursuing blue-water naval expansion, including aircraft carriers and nuclear-powered submarines. At least in some cases, their long-distance submarines are, or are expected to be, nuclear weapon-equipped. Modern naval development is so costly, however, that the R&D and production schedules on both sides stretch over many years. India has expanded the naval share of its defense budget, but China has more money to spend, and is already exercising its military access to the Arabian Sea with rotating, conventionally-armed naval flotillas (primarily destroyers and frigates, but also some landing-support ships). In the longer term, maritime nuclear escalation ladders for India and China will come into play and should be mapped. They probably will not be exclusively dyadic, however, because many other national navies, including the U.S. Navy, operate in the same waters.

For the time being, Indian and Chinese maritime escalation ladders do not reflect the operational deployment of strategic nuclear platforms within the Indian Ocean and their operational conventional naval assets would not impinge much on their land border confrontations in the Himalayas. Some day this picture is likely to change. But the bilateral escalation ladders that matter operationally between them today have a land warfare focus.

Note: The current report depicts an Indian Escalation Ladder facing China (in Figure 3, below), but stops short of depicting the Chinese counterpart ladder facing India. Depicting a counterpart Chinese ladder would be feasible with more time and resources, but would need to overcome the fact that publicly available data on Chinese military deployment and infrastructure in Tibet and the Tibetan Autonomous Republic (TAR) is scarcer as well as currently in flux and describing rungs on the ladder might be somewhat sketchier and less reliable.

E. India's Escalation Ladder vs. China

India has spent nearly five decades and great effort since the Chinese PLA incursion in 1962 to fortify its conventional defenses along the over 3,100 adjusted miles of the Line of Actual Control (LAC) facing China in the Himalayas. Much progress has been made in physical infrastructure and force development that makes a repeat of that humiliation quite unlikely. The terrain, however, gives significant combat advantage to Chinese

forces based on the Tibetan plateau (“roof of the world”) since access to India is downhill through mountain corridors, while Indian forces generally would have to fight and resupply through similar corridors uphill. The inhabited areas of Tibet range from 3,500 to 4,500 meters (the average altitude of 4,000 meters is 16,000 feet). The drawbacks for Chinese forces include water scarcity in the summer, generally low temperatures with snow or frost for 6 months of the year, the thin air (low oxygen) for those not properly acclimatized, and the load limitations on aircraft and transport helicopters landing or taking off at those altitudes. These factors also affect Indian forces prepositioned at or near those altitudes, and their aerial resupply.

India has built access roads into the mountains, border outposts, support bases, and numerous airfields below or in the foothills. India built and has maintained 10 mountain divisions each with nested artillery brigade components for many years, and reportedly has raised, trained, and equipped two more mountain divisions of 36,000 troops each since 2008. It has incrementally built and reinforced logistical support depots, truck transport fleets, and light transport aircraft for mountain operations, and has also beefed up sub-regional paramilitary forces. As concerns about what Indian officials have described as a “new assertiveness among the Chinese” in Tibet have risen in 2009 and 2010, India has made new commitments to strategic road-building and airstrips near the LAC (not only along the northeast but also in Ladakh near Aksai Chin), has mooted raising a new mountain “strike corps”, is redeploying four squadrons of Su-30MKI advanced strike aircraft (two squadrons each to Tezpur and Chabua air bases in Assam), reportedly has bolstered air defense with a network of transportable low-altitude radars in the east, and also expects to use AWACs and drone aircraft for surveillance in those sectors.⁷ From India’s point of view, the coupling of the land warfare relationship with China in the Himalayas is tightening.

What India is reacting to is China’s push over the last several years to build up commercial as well as military infrastructure in Tibet, including roads, rail lines, commercial airports and military airfields.⁸ Some of the transport routes are linked by road to the Karakorum highway and corridor in Pakistan. The vast and still sparsely populated Tibetan buffer area is beginning to be integrated commercially as well as fortified by China and connected with overland road and rapid transit rail links to its much denser military infrastructure to the northeast (Qinghai) and directly east to Chengdu (Sichuan basin). The high-altitude Qinghai-Lhasa rail line running southwest to Lhasa from Xining in Qinghai province was completed in 2006 and connects to the east and south through interior rail lines to many of the major cities and provinces of China. China has also started building an extension of the Qinghai-Lhasa railway to connect Lhasa to its southwest with Xigaze (Shigatsey), with plans to extend the rail line further on south to the border of Nepal by 2014. A new airport at Xigaze also began operating in 2010. Another spur from the Qinghai-Lhasa railway is soon to be built to connect Lhasa with Nyingchi, which is less than 50 kilometers from the LAC in Arunachal Pradesh.

⁷ See IISS, *The Military Balance 2011*, p. 212.

⁸ *Ibid.*, pp. 211-212.

Fig. 3. Indian Escalation Ladder - Facing China in the Himalayas

Rung Order	Response or Initiative	Context and Probability Estimate			
		Peace	Military Crisis	Terrorist Attack	War in Progress
20	All out counter-value strike		ongoing		<20
19	Strategic counter-military strike				<10
18	Proportional retaliation vs. TNW				>95
17	Demonstrative nuclear weapon use				<30
No Nuclear Use Threshold					
16	Reciprocate, if China installs SRBMs			not	
15	Conventional air campaign vs bases and airfields			in	>75
14	If no choice, wage local conventional campaign			the	>50
13	Full nuclear alert (wpns assembly and transfer)			current	100
12	Complete full mobilization, all services			deck	>80
No Major Conventional War Threshold					
11	Reinforce forward positions		>60	of	>90
10	Precautionary nuclear alert (no transfer)		>40	cards	>90
9	Reinforce mountain divisions, stockpiles		>60	on	>60
8	Alert ground and air forces all sectors		>95	on	100
No Conventional War Threshold					
7	Roll back infringements on forward access	>50	>90	side	
6	Local patrol skirmishes over border lookouts	>50	>90		
5	Expanded naval ops perimeter, showing the flag	>30	>75		
No "Hot" Warfare Threshold					
4	Upgrading roads and defense infrastructure	>60	100		
3	Military signalling (Agni missile tests, exercises)	20	>60		
2	Pre-crisis maneuvering, gestures, diplomacy	30	>75		
1	Accelerating strategic asset acquisition	15	>75		
Disagreement - Geopolitical Rivalry					

Nyingchi also has a new airport. The Government of India has recently acknowledged in Parliament that this infrastructure shortens the time for China to surge regular troops into Tibet near the LAC.⁹

⁹ See report on Indian Defence minister's answers to questions in Parliament on China's activity in Tibet, by Rajat Pandit, "China has five airbases, extensive rail-road networks in Tibet: Antony," Times of India, March 11, 2011, reference on line at: http://articles.timesofindia.indiatimes.com/2011-03-08/india/28668105_1_airbases-sukhoi-squadrons-tar

It is worth emphasizing as context for India's escalation ladder vs. China that there has never been any credible evidence of China deploying nuclear missiles or other nuclear weapons in Tibet proper – and certainly not close to the LAC, though this has been claimed by Indian analysts in think tanks and reported in the media frequently over at least three decades. China is also not known to have TNW in the classical battlefield or naval forms, although it tested some low-yield weapons and probably considered TNW development at certain points of time. The paucity and unreliable quality of information about China on this subject, including contradictory findings released by US intelligence sources since the 1980s, is reviewed in considerable detail as of 2006 by the Nuclear Information Project.¹⁰ The closest Chinese nuclear missile bases to the Tibet Autonomous Republic (TAR) would appear historically to be more than 1,000 kilometers from the LAC to the north, east, and south, for example, in Qinghai province (Delingha) and Yunnan province (Jianshui). China could, as could India or Pakistan, use strike or transport aircraft to deliver gravity nuclear bombs (tactical use) in a battlefield context.

As the land-based relationship with India tightens up, China could also deploy dual-capable SRBMs and MRBMs in Tibet facing India, but there have been no signs so far of it doing so. This kind of response may be conceivable in the future, however, as India develops, tests, and is expected eventually to deploy nuclear-tipped, land-based ballistic missiles (Agni III, Agni V) with ranges capable of reaching cities in China's interior.

India's Escalation Ladder Facing China in the Himalayas in Figure 3 suggests that there are many rungs of escalation prior to conventional warfare and in conventional warfare to exercise below the nuclear threshold and that there probably would be reluctance to escalate at the higher rungs to a strategic nuclear exchange. This does not rule out potential instability but it suggests that the conventional level of deterrence has more efficacy for both sides than can be counted on in the India-Pakistan dyad. This would seem to be consistent with several factors. While NFU as a declaratory policy is no guarantee of nuclear "no first use", China was the first strategic weapons state to adopt this formulation. Hence, for China it not only has historical resonance but may have some practical credibility. After all, China also faces the largest nuclear powers, Russia and the United States. It would be problematic for China to be caught up in an intense nuclear confrontation with India that could cause it to let its guard down in the other relationships, and natural for it to steer away from this possibility. China may regard the Indian NFU statements as usefully reciprocal, at least in the political sense.

While China has shown no interest to date in extending its nuclear deterrence of India to Pakistan, it is remotely conceivable that changing circumstances in South Asia could draw it toward Pakistan in that fashion. Such a linkage between the Pakistani and Chinese nuclear escalation ladders facing India, were it to develop, almost certainly would add a quantum level change in tension between India and China. The judgment here is that China is most likely to shy away from extended deterrence of this kind under foreseeable

¹⁰ See the report, *Chinese Nuclear Forces and U.S. Nuclear War Planning*, November 2006, chp. 2 ("Estimates of Chinese Nuclear Forces"), pages 64ff, accessed at <http://www.nukestrat.com/china/Book-35-125.pdf>.

circumstances. The one factor that might persuade reexamination of this issue would be Pakistan's potential grant to China of freedom to use Gwadar port as a naval base, with military storage and resupply facilities on Pakistan's territory. A Chinese naval presence of this kind would not necessarily compel China to formally extend nuclear deterrence over Pakistan, but if it were to have a substantial naval presence in Gwadar, it would complicate any offensive Indian military action against Pakistan.

III. Threat Reduction and Arms Control

Bilateral American and Soviet success with negotiated nuclear arms reduction agreements ultimately contributed to the winding down of the Cold War, and set the stage for multilateral agreements that greatly reduced conventional arms levels in Europe and spread new forms of transparency. Above all, these measures dispersed the clouds of unlimited nuclear war. They also helped advance international treaties and a wide range of other threat reduction and dismantlement measures related to stored nuclear warheads and fissile materials and large former arsenals of chemical and biological weapons. The various types of arms control and threat reduction measures, and especially those related to weapons of mass destruction (WMD) were seen as contributors to stability and security. They received strong military support from the participant countries in part for their additional contribution to predictability, a value in defense planning and confidence in national security.

In light of these East-West developments, many of which were unprecedented and extraordinary at the time, it is natural for westerners to wonder why arms control is resisted so strongly in Southern Asia, a region where conventional war has been recurrent and nuclear arms have taken hold in two new nuclear states since the Cold War. The nuclear escalation ladders highlight the added risks of nuclear weapons to security and national development and make the case implicitly for arms control, but they do not specifically explain why arms control has so little appeal or traction.

Some tentative explanations of the low appeal of arms control may still be useful, and may even help to turn up new ideas on how to enhance the appeal of threat reduction and arms control measures as circumstances change.

One factor clearly is that the relationships among India, Pakistan and China contain significant asymmetries of military capability and relative security. The Cold War experience suggests that negotiated arms control is more likely to advance when opponents have approximate parity as starting points and can visualize gains to their security from reducing their defense burdens and uncertainties about deterrence on a reciprocal basis. Redressing fundamental asymmetries related to major differences in size, resource endowments or geography is not necessarily practical, but improving relative security may be. In dyadic relationships, opponents can, at least in principle, work to reduce mutual dangers from uncertainty about the efficacy of deterrence. The objective of deterrence is to dissuade the exercise of great threat. Threat reduction tools can be employed to reduce both the likelihood and the perception that an available great threat will be exercised and the opponent's deterrence thereby necessarily fail. Outside

partners may be able to offer constructive assistance to regional opponents in the same vein.

A second factor lies in ingrained perceptions that arms control is a tool that frequently undercuts international status. This has been particularly evident in India's stance on the NPT, whose obligations India labeled as unequal and politically discriminatory. India sets a high bar on standards for its participation in international agreements. It is also reluctant to participate in bilateral agreements that could diminish its international status. China has had similar reservations. Pakistan is somewhat more receptive to bilateral arms control than India but often sees it as a mechanism for equalizing its position vis-à-vis India.

A third factor has been aversion to processes that may hobble freedom of national development. Both China and India, but also Pakistan, started in the post-World War Two environment from positions lower on the scale of science and technology than Europe, the USSR, and the West. As "rising" powers now making significant progress in redressing their perceived technology deficiencies, they are loath to engage in negotiations that they fear may subtly hamper that progress.

A fourth factor may well be a perspective that nuclear risks can be managed successfully and that they have been lowered over time by observation, learning, and vicarious historical experience. This perspective may be held more distinctly by India and China than Pakistan, but arises from watching the strategic arms race compulsions of the USSR and the U.S., and deeming them excessive, a model to avoid. While this viewpoint may seem complacent and even unrealistic to those who were caught up in the Cold War, it may have some virtue if it does lead India and China to avoid their own excesses.

Finding ways to advance threat reduction and arms control will still exist, with opportunities emerging through changing circumstances, or even suddenly from a catastrophic development. The burdens of maintaining deterrence stability to contain threats by posing threats and refinement or expansion of military capabilities ultimately turn a spotlight on other less herculean approaches to enhancing security.

It is worth keeping in mind that even though the relationship between India and Pakistan has been highly competitive and crisis prone militarily, a few incremental advances have been made in nuclear stability, some unilateral, and some bilateral. Pakistan has worked hard and successfully to develop a tight nuclear command and control system and India evidently believes it has done the same. Three specific and meaningful areas of agreement, albeit narrow, have arisen from bilateral initiatives. One is the agreement to give nuclear installations sanctuary from attack, with relevant, periodic data exchange. A second is the agreement to notify the other of impending missile tests. A third is the regulation of military aircraft with a no-fly zone close to the borders. The hotline agreements are also attractive in principle but are not really used for the intended purpose and are left with little more than public relations value.

A substantive measure developed in track two dialogues is to agree on eliminating or restricting the use of nuclear-capable short-range missiles. This could be a useful step towards enhancing nuclear deterrent stability, but it remains to be seen whether it can be suitably defined and actually come to fruition. If it did it would also add some weight to the utility of track two dialogues, which in any case have been useful for encouragement of understanding and restraint in the official arena. Even more valuable would be military to military talks, India with Pakistan, and India with China. China and the U.S. have their own cautious bilateral history of such talks. The impediments to such talks between China and India should not be insuperable.

Conclusions

This exercise in mapping dyadic nuclear escalation ladders is one approach to clarifying escalation dynamics and a stimulus to practical thought about how to control and appropriately stop military escalation so that it does not culminate in nuclear war and catastrophe. The ladders depicted help to highlight the risks of employing limited conventional war offensively and suddenly in an attempt to deter subconventional actions, and serve to encourage policy thinking about alternative means to accomplish that end. Under the nuclear overhang, the most obvious answer is to give up or repress subconventional means, a positive course of action that may be called for on both sides.

The Indian and Pakistani ladders also highlight the special characteristics of asymmetry in geography and unequal conventional military capability, and the impact on the weaker of the conventional imbalance becoming worse over time, while insurgency compels a shift of some resources to the rear. Pakistan relies on its strategic force to deter the possibility of India launching an all out conventional war. But Pakistan would prefer to rely on its compact conventional forces to deter conventional aggression, rather than have to fight defensively against sharp, shallow incursions. The ladder depicts its conventional escalation options and suggests how much closer the nuclear rungs are if those measures fail.

The Indian ladder versus China helps characterize the likely dynamics of escalation in land warfare where the engagement is slowly tightening, while looking further ahead to a time when maritime conflict and escalation may also be a part of the India-China picture. If there is asymmetry in this relationship on land, it is one that favors China over India today, particularly at the nuclear level. But the conventional balance is arguably more equal, even though the geography from the Tibetan plateau through the mountains challenges the Indian side more as it organizes its campaigns from the foothills and plains. This escalation ladder thus sheds light on mountain warfare. It reflects a much higher nuclear threshold for both sides in the Himalayas than Pakistan would have versus India in the plains. But it also brings in the potential complexity of bringing short-range nuclear missiles into play.

While these nuclear escalation ladders are designed to serve heuristic purposes in policy and military analysis, they could be useful tools for simulation exercises in which participants are chosen both for relevant experience and openness to learning. The

escalation ladders would be part of the scenario constructs for role playing games or simulations. The simulation feedback would serve to improve the ladder constructs and scenarios and perhaps make them more realistic. The game or simulation outcomes could offer significant insights into how escalation scenarios play out, and lessons on how unproductive or catastrophic escalation could be reigned in at lower levels.

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Appendix A

Herman Kahn's Nuclear Escalation Ladder

From his *On Escalation: Metaphors and Scenarios*, N.Y.: Praeger, 1965, **Figure 13.4, p. 39.** (Republished by Transaction Publishers (New Brunswick, N.J.), 2010.)

Aftermaths

- | | |
|----------|--|
| | 44. Spasm or Insensate War |
| Civilian | 43. Some Other Kinds of Controlled Central War |
| Central | 42. Civilian Devastation Attack |
| Wars | 41. Augmented Disarming Attack |
| | 40. Countervalue Salvo |
| | 39. Slow-Motion Countercity War |

(City Targeting Threshold)

- | | |
|----------|---|
| | 38. Unmodified Counterforce Attack |
| | 37. Counterforce-with-Avoidance Attack |
| Military | 36. Constrained Disarming Attack |
| Central | 35. Constrained Force-Reduction Salvo |
| Wars | 34. Slow-Motion Counterforce War |
| | 33. Slow-Motion Counter-“Property” War |
| | 32. Formal Declaration of “General” War |

(Central War Threshold)

- | | |
|-----------|--|
| | 31. Reciprocal Reprisals |
| Exemplary | 30. Complete Evacuation (Approximately 95%) |
| Central | 29. Exemplary Attacks on Population |
| Attacks | 28. Exemplary Attacks Against Property |
| | 27. Exemplary Attack on Military |
| | 26. Demonstration Attack on Zone of Interior |

(Central Sanctuary Threshold)

- | | |
|---------|---|
| | 25. Evacuation (Approximately 70 per cent) |
| Bizarre | 24. Unusual, Provocative, and Significant Countermeasures |
| Crises | 23. Local Nuclear War – Military |
| | 22. Declaration of Limited Nuclear War |
| | 21. Local Nuclear War – Exemplary |

(No Nuclear Use Threshold)

- Intense Crises
20. “Peaceful” World-Wide Embargo or Blockade
 19. “Justifiable” Counterforce Attack
 18. Spectacular Show or Demonstration of Force
 17. Limited Evacuation (Approximately 20 per cent)
 16. Nuclear “Ultimatums”
 15. Barely Nuclear War
 14. Declaration of Limited Conventional War
 13. Large Compound Escalation
 12. Large Conventional War (or Actions)
 11. Super-Ready Status
 10. Provocative Breaking Off of Diplomatic Relations

(Nuclear War is Unthinkable Threshold)

- Traditional Crises
9. Dramatic Military Confrontations
 8. Harassing Acts of Violence
 7. “Legal” Harassment – Retortions
 6. Significant Mobilization
 5. Show of Force
 4. Hardening of Positions – Confrontation of Wills

(Don’t Rock the Boat Threshold)

- Subcrisis Maneuvering
3. Solemn and Formal Declarations
 2. Political, Economic, and Diplomatic Gestures
 1. Ostensible Crisis

_____ Disagreement – Cold War _____

Bottom of ladder