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THESIS

HOW WILL THE INDIAN MILITARY'S UPGRADE AND MODERNIZATION OF ITS ISR, PRECISION STRIKE, AND MISSILE DEFENSE AFFECT THE STABILITY IN SOUTH ASIA?

by

Jay P. Dewan

March 2005

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India has made a concerted effort to upgrade its ISR, precision strike, and missile defense capabilities as it competes with China and Pakistan for regional power. The Phalcon Airborne Warning and Control System, Su-30MKI fighter-bomber aircraft, and S-300PMU surface-to-air missile system are some examples of the new capabilities India is acquiring. I argue that if India continues its military modernization, Pakistan will become more insecure. The increase in the conventional military capabilities gap will likely upset the existing balance of power in South Asia, leading to a regional arms race, lowering the nuclear threshold, and increasing instability in the region.

The strategic stability/tactical instability paradox that exists between two nuclear countries may lead them to engage in "small" wars. India's increasing military capabilities may encourage it to conduct a preventive strike against Pakistan. In such a climate, a regional arms race eventually may lead Pakistan to establish a "hair-trigger" nuclear posture. India's effort to achieve a significantly superior conventional military force over Pakistan paradoxically may reduce Indian security by causing greater instability, and possibly lead to nuclear war. Regional stability is enhanced to the extent that there is a rough conventional military balance between India and Pakistan.

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HOW WILL THE INDIAN MILITARY'S UPGRADE AND MODERNIZATION OF ITS ISR, PRECISION STRIKE, AND MISSILE DEFENSE AFFECT THE STABILITY IN SOUTH ASIA?

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Submitted in partial fulfillment of the
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MASTER OF ARTS IN NATIONAL SECURITY AFFAIRS

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ABSTRACT

India has made a concerted effort to upgrade its ISR, precision strike, and missile defense capabilities as it competes with China and Pakistan for regional power. The Phalcon Airborne Warning and Control System, Su-30MKI fighter-bomber aircraft, and S-300PMU surface-to-air missile system are some examples of the new capabilities India is acquiring. I argue that if India continues its military modernization, Pakistan will become more insecure. The increase in the conventional military capabilities gap will likely upset the existing balance of power in South Asia, leading to a regional arms race, lowering the nuclear threshold, and increasing instability in the region.

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I. INTRODUCTION/ INDIAN MILITARY MODERNIZATION AND STABILITY IN SOUTH ASIA

India is upgrading its armed forces as it competes with China and Pakistan for regional power. India has made concerted efforts to upgrade its intelligence, surveillance, and reconnaissance (ISR), precision strike, and missile defense capabilities to improve its influence as a regional military power. However, it is in the U.S. economic, military, and political interest to maintain stability in South Asia. India is the world's largest democracy, which is moving towards greater economic freedom and is committed to political freedom. India, along with the United States, shares an interest in fighting terrorism, and Pakistan is a vital partner of the United States in the Global War on Terrorism (GWOT).[1] India and Pakistan also are nuclear states that have had a history of wars against each other. Both countries, under the protection of the nuclear umbrella can be expected to challenge each other as what Glenn Snyder identified as the strategic stability/tactical instability paradox. It is therefore important for the United States to understand the potential consequences of India's conventional military modernization on the stability in the region. This thesis argues that if India continues its military modernization efforts, it will likely upset the conventional balance of power in South Asia as it increases the military capabilities gap between itself and Pakistan, leading to a regional arms race and increased instability in the region as a consequence of lowering of the nuclear threshold by Pakistan.

India has made concerted efforts in recent years to modernize its ISR, precision strike, and missile defense capabilities. These efforts have been due to the potential threat from China and Pakistan, the lessons learned during the Kargil crisis, and from observing the successes of the U.S. military in its operations during the Gulf War. However, India's continuing efforts to upgrade its military capabilities will threaten the security environment and instigate an arms race in the region.

[1] U.S. Department of State website, "Bureau of South Asian Affairs," November 2004, http://www.state.gov/r/pa/ei/bgn/3454.htm, accessed on 19 February 2005.

What form the instability will take is yet to be determined. One of the key requirements for stability is the prevention of preventive war.[2] For example, if State A maintains a military advantage over State B but fears State B's growing military capability, it conducts a preventive strike against State B to prevent it from increasing its military capability to threaten State A in the future. This would be a condition of instability since State A could conduct a preventive war. In the case of India and Pakistan, the question that needs to be asked is will India, under the strategic stability of nuclear weapons and with an increasing conventional superiority compared to Pakistan, be threatened by a Pakistan insistent on an arms race and be encouraged to conduct a preventive war against Pakistan? It is possible that India may believe that it can achieve a victory against Pakistan at an acceptable cost given its increasing ISR, precision strike and missile defense capabilities. Or will Pakistan, under what Glenn Snyder identified as the strategic stability/tactical instability paradox, be encouraged to conduct low-scale wars under the protection of nuclear weapons against what it considers to be a threatening and increasingly powerful India - as it did during the Kargil Conflict?[3] As Waltz stated, "because nuclear weapons limit escalation, they may tempt countries to fight small wars."[4] In a South Asia that has bigger and better weapons, an arms race in a nuclear environment is likely to cause instability in the region.

The causes and affects of India's military modernization need to be evaluated to identify the possible responses by Pakistan, and what effect those responses will signify for the region. Therefore, the second chapter of this thesis presents the "why" behind India's efforts to modernize its military. This chapter presents India's perceived threats and the reasons behind its motivations to pursue the modernization of its ISR, precision strike, and missile defense. The third chapter presents the "what" – the efforts India has undertaken through upgrade and acquisition to modernize its ISR, precision strike, and missile defense capabilities. The fourth chapter evaluates Pakistan's responses and presents some likely responses in the future to India's military modernization. The fifth

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[2] Kenneth Waltz and Scott Sagan, *The Spread of Nuclear Weapons* (New York: W. W. Norton, 2002), 91.

[3] Waltz and Sagan, *The Spread of Nuclear Weapons*, 97.

[4] Ibid, 122.

and final chapter is the conclusion and provides some recommendations for U.S. policy makers on how to prevent instability in the region.

A. MOTIVATIONS

Chapter II evaluates India's threat perceptions in order to understand the motivations behind India's pursuit to modernize its ISR, precision strike, and missile defense capabilities. Indians believe that the potential threat to their security will come from either of their two nuclear neighbors, China or Pakistan, or through a proxy war conducted by Pakistan and it is this perceived threat that has driven India to pursue the modernization of its ISR, precision strike and missile defense.[5] Indians also believe that as a growing economic power they have to protect their growing interests in the region.[6] Therefore, it is essential for the Indians to develop a military commensurate with its interests.

India's economy has been growing at a steady pace since it undertook economic reforms in the early 1990s. And as the economy has grown, so have its imports and exports, and the country's reliance on energy sources. It is important to India to be able to protect these interests for its economic security. This has been a drive behind India's overall military modernization. However, for reasons behind India's efforts to modernize and upgrade its ISR, precision strike, and missile defense in particular, India's threat perceptions need to be evaluated.

India views China as its competitor both economically and as a potential regional power. Indians believe that as China's economic capabilities grow so do its superpower aspirations. Indians cite that the People's Liberation Army (PLA) has been modernizing its military over the past decade and can pose a serious threat to India's security in the future. China is set to add some 300 Su-30, 500 J-7/J-8 II/FC-1/J-10, Airborne Warning and Control System (AWACS), modern Surface to Air Missiles (SAMs) like the S-300

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[5] Ministry of Defence, Government of India, Annual Report 2002-2003, pg 2, http://www.mod.nic.in/reports/welcome.html, accessed on 17 February 2005.

[6] Interview with CDR P.K. Ghosh, United Service Institution of India, New Delhi, on 10 February 2005.

and a variety of Cruise Missiles in large numbers, and the Indians perceive this as a threat to their security and a potentially major shift towards China for the power balance in the region.[7]

Given that India and China still have disputed territories along their borders and both countries have fought each other in the past, Indians believe there is a distinct possibility that the two countries may go to war against each other in the future. In order to deter a military confrontation with China, India is attempting to pursue military parity with the Chinese in hopes to deter the Chinese from going to war with India and instead persuade them to pursue negotiations.

Tensions between India and Pakistan have been high throughout their existence. The two countries have been to war on three different occasions, and have had other near-wars. As recently as 1999, after the two countries had conducted nuclear tests a year earlier, India and Pakistan were involved in an armed conflict in the Kargil sector of Kashmir. And in 2002, following the attacks on the Indian parliament in December 2001, the two countries again came close to an all out war. India also holds Pakistan responsible for waging a proxy war through Islamist extremists in Kashmir.

Indians perceive Pakistan as an unstable country that has been through several military coups and government overthrows and views Pakistan's military dominated government to be spending a disproportionately high amount of money on its military. Having an undemocratic neighbor with the military at the helm will continue to be a concern for India. India believes that Pakistan will continue to finance "terrorists" who will continue to threaten Indian security, and is seeking to find conventional space in which it might exercise punitive measures to deter such proxy warfare.[8]

Therefore, to prevent future wars with either China or Pakistan, Indians believe they need to possess the military capability to be able to dissuade and deter their potential adversaries, and to effectively counter the insurgency in Kashmir. In order to accomplish this, India is modernizing its ISR, precision strike, and missile defense capabilities.

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[7] V. Phadke, "Response Options: Future of Indian Air Power Vision 2020," *Strategic Analysis*, 24, no. 10 (January 2001), 4.

[8] Interview with Brig. Gurmeet Kanwal (Retd.), Observer Research Foundation, New Delhi, 7 February 2005.

B. MODERNIZATION

Chapter III focuses on the efforts being undertaken by the Indian military to modernize its ISR, precision strike, and missile defense, and the capabilities they provide to the Indian military.

India is indigenously developing and acquiring foreign weapons systems to deter aggressive actions from both China and Pakistan. To improve its ISR capabilities, India is focusing on the Phalcon Airborne Warning and Control System (AWACS), surveillance radars, weapon locating radars, maritime surveillance aircraft, Unmanned Aerial Vehicles (UAVs), and satellites. For precision strike, India's efforts are geared towards acquiring the Su-30MKI, Mirage 2000-5, upgrading the Jaguar and the MiG-27, acquiring and developing anti-tank guided weapon systems, guided artillery weapons, multi-purpose guided weapons, and the Rafael litening targeting pod. To develop an anti-missile defense capability, as well as to continually improve its conventional air defense, India is focusing on the Barak anti-missile missile system, Green Pine anti-missile system, Antey 2500 anti-ballistic missile launchers, and the S-300 PMU air defense system.[9]

The ISR, precision strike, and missile defense systems mentioned above are expected to provide India with the ability to dissuade and deter its potential attackers by helping achieve a military edge over Pakistan and by helping bridge a quality gap between the Chinese military and the Indian military. The modern technology is expected to improve India's capabilities to survey the potential threats to its security and respond to them in a timely, effective, and efficient manner. The ISR systems will provide an improved capability to detect and track enemy infiltration, and will also provide improved queuing for patrolling assets to engage the enemy. Having precision strike capability will then allow the engaging assets to effectively and efficiently engage and neutralize the enemy with a high degree of success. In the case of a missile attack, India's future missile defense capability is expected to defend against a potential nuclear attack. Having an improved ISR, precision strike, and missile defense capability is

9 Lt. General RK Jasbir Singh, PVSM, ed. *Indian Defense Yearbook 2004*, (Dehra Dun, India: Natraj Publishers, 2004).

expected to dissuade and deter a potential enemy by ensuring its detection and punishment, and a successful defense against a missile attack is expected to deter the enemy form launching an attack in the first place.

C. PAKISTAN'S RESPONSE

This chapter analyzes Pakistan's perspective on India's military modernization and its likely reactions. The increase in military spending by India has been a direct concern for Pakistan, and it is likely to view India's recent modernization efforts as a threat to its security. India's military modernization program has led to a growing disparity between the Indian and Pakistani conventional military capabilities. If India pursues its policy to achieve technical superiority in ISR, precision targeting and missile defense, this will provide India the capability to effectively locate and efficiently destroy strategically important targets in Pakistan and congruently defend against a strike from Pakistan. India's new-found ISR capability, through its acquisition of the Phalcon AWACS, will provide India with the ability to locate targets deep inside Pakistan's territory, and direct India's superior aircraft, like the Su-30 and the Mirage 2000-5, with their air-to-air and precision strike capabilities onto those targets. Possessing advanced precision strike capability will ensure high probability of kill, and put Pakistan at a significant disadvantage. The result of this growing divergence in the two countries' conventional capabilities will be either a regional arms race – as Pakistan desperately attempts to keep pace with India in order to deter a preventive strike from India, and/or a lowering of the nuclear threshold for Pakistan – as it fails to keep up the conventional arms race with an economically powerful India and therefore needs to rely on its nuclear arsenal for a deterrent. Additionally, if Pakistan feels it needs to rely on its nuclear arsenal for its survival and India is successful in obtaining a functional missile defense capability, it will deliver a significant blow to Pakistan's perception of its security. If India can defend itself against the only recourse Pakistan has, i.e., its ability to deliver nuclear missiles on Indian targets, then Pakistan will be left with only one choice – to undertake a massive nuclear missile build-up in order to possess the ability to saturate India's missile defenses and still retain its nuclear deterrent. In any case, none of the

potential scenarios are a welcoming possibility for a future in a region the United States would like to see stable for reasons already mentioned.

D. CONCLUSION CHAPTER

This chapter provides the results based on the information provided in the previous chapters. Having evaluated the reaction from Pakistan, the conclusion is that the end result of India's modernization of its ISR, precision strike, and missile defense capabilities, will be an increase in the destabilization of the region. It also presents an explanation, based on the realism argument, for the continuing hostilities between India and Pakistan. According to this argument the India–Pakistan conflict is the direct consequence of the imbalance of power between the two states and Pakistan's insecurity about this imbalance.

An India-China war is not likely in the near-term, but there is a possibility of an India-Pakistan war in the near future. For example, India claims to be modernizing its military equipment specifically geared towards a threat from China. India's acquisitions of sophisticated ISR equipment, precision strike, and missile defense, and even its recently acquired capability to conduct air-to-air refueling can be justified to be China-specific. India claims it needs to match China's modernization efforts and therefore must obtain SU-30MKIs with refueling capability to be able to reach China's heartland. Using China as a justification for procuring SU-30MKIs and stationing them out of reach of Pakistan's capability to threaten the assets provides India with a capability to conduct missions into Pakistan while minimizing the threat to their high-value assets. Even if India's military upgrades are specifically geared towards China, they can also be targeted against Pakistan. What it will lead to is Pakistan feeling greater sense of insecurity due to India's improving military capabilities due to its efforts to protect itself against the perceived threat form China. And for now, India does not have the capability to conduct a successful war against China, but it does have the potential to severely hurt Pakistan. It is this threat to Pakistan, and its potential response to the threat caused by India's military modernization (whether China specific or not), that has the potential to cause instability in the region. And this potential India-Pakistan threat to the stability in South Asia will be the focus of this thesis.

The conclusion presents an explanation for the continuing hostilities between India and Pakistan. According to the Realism argument, the India–Pakistan conflict is the direct consequence of the imbalance of power between the two states and Pakistan's insecurity about this imbalance. Hence, the more sophisticated military equipment India obtains and the greater the gap widens between the Indian military and the Pakistani military, the more threatened Pakistan will become and the more actions it will take in order to increase its security vis-à-vis India. This will lead to greater instability in the region. As Indian analyst R. Rajagopalan, says, "The persistence of the conflict is a consequence of the persistence of this imbalance and of Pakistan's attempts to correct it."[10]

The Indian Armed Forces' superiority in strength and technological capabilities poses an increasingly serious threat to the security of Pakistan. In light of India's growing conventional military superiority, Pakistan has needed to explore options to achieve a strategic balance with India. Pakistan has sought this balance by pursuing a nuclear weapons program. "Pakistan launched its nuclear program to establish a deterrent against India and to compensate for India's conventional military advantages".[11] This is one example of a drastic measure that Pakistan had to employ to maintain parity with India's growing military capability and bolster its own deterrent.

Pakistan remains fearful of India's regional and global power aspirations and has maintained close security ties with China in an effort to balance India's conventional superiority and nuclear capability. Pakistan has procured several weapon systems from China and will likely continue to do so as long as the Indian military remains significantly more capable than Pakistan's.

If India continues its build-up and upgrading of its military equipment, Pakistan either will enter into an arms race and increase its conventional military equipment or continue to rely on its nuclear weapons and the option to initiate a nuclear strike to maintain a deterrent against an Indian military attack. Rather than provide security to

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[10] R. Rajagopalan, "Neorealist Theory and the India-Pakistan Conflict–II," *Strategic Analysis*, 22, no. 10 (January 1999), 1.

[11] Abidi, Zawar. "Threat Reduction in South Asia." Date Unknown. www.stimson.org/southasia/pubs.cfm?ID=87 accessed 17 February 2005, 4.

India, achieving a significantly superior conventional military force compared to Pakistan will only lead to an arms race and greater instability in the region and potentially even a nuclear war.

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II. WHY IS INDIA MODERNIZING ITS ISR, PRECISION STRIKE, AND MISSILE DEFENSE CAPABILITIES?

There has been a concerted effort by the Indian military in recent years to modernize its intelligence, surveillance, and reconnaissance (ISR), precision strike, and missile defense capabilities. These efforts by the Indian government to modernize its military are primarily due to the potential threat from China and Pakistan, from the lessons learned by the Indian military from their experience during the Kargil crisis, and from observing the success of the U.S. military during the Gulf War. This chapter will present the perspective of why India is modernizing its ISR, precision strike, and missile defense capabilities.

A. THREATS

For most of its history India has continued to rely on the seemingly impenetrable natural boundaries – Himalayas to the north and the Indian Ocean in the peninsular south – for its security. Rarely have they ventured past these boundaries to create a buffer for greater security. This lack of surveillance and reconnaissance has led to invaders approaching unchallenged until in vicinity of the center of power, as was the case with Babur who fought the decisive battle at Panipat on the outskirts of Delhi.[12] Security did not become a concern for India until the Kashmir War against Pakistan, following independence from Britain. The Kashmir War demonstrated the need to be able to defend against military aggression with adequate capability; however India had basic economic issues to deal with at independence. At its conception India had a chronic deficiency in its ability to feed its people. The Great Bengal Famine had only occurred a few years before independence and India was a net importer of food-grain for a couple of decades after independence. The priority at independence according to Nehru was, "the ending of poverty and ignorance and disease and inequality of opportunity."[13] This led to

[12] K. Shrivastava, "Indian Army 2020: A Vision Statement on Strategy and Capability," *Strategic Analysis* 25, no. 6 (September 2001), 2.

[13] Amartya Sen and Jean Dreze. *India: Economic Development and Social Opportunity*. Oxford University Press, 1999, 1.

a powerful pull towards development at the cost of national defense, since the political leaders tended to view the choice as an alternative between development and military. This bias on development at the cost of defense was acknowledged by Jawaharlal Nehru in a speech in Parliament following a devastating defeat suffered by the Indian military at the hands of the Chinese in 1962, "We were anxious to use all the resources we had for economic betterment, for industrialisation, and all that. We were anxious not to spend too much on the Army…"[14] Until 1962 defense spending was deliberately limited to 1.5 percent of the Gross Domestic Product (GDP), however, since the war with China the money for defense had been forthcoming at an average annual rate of 3.05 percent of the GDP for 25 years after 1962.[15]

For the foreseeable future, the potential threat to India's security will come from either China or Pakistan. China is expected to remain India's primary long-term strategic challenge and Pakistan as a short- to medium-term threat.[16] Indians perceive Pakistan and China as pursuing an anti-India strategy and foresee both countries to pose a military threat to India.[17] It is the security policies of China and Pakistan that governs India's conventional defense strategy.

1. China

Even though China and India have been at relative peace with each other for over four decades, Indians believe the Chinese attitude towards India could change as China makes strides towards becoming a superpower. Indians expect China to remain its primary strategic challenge politically, economically and militarily.[18] The two nations are competitors economically as well as potential regional powers. As China's economic capabilities grow so do its superpower aspirations, and with it China's military capabilities.

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[14] Jasjit Singh, India's Defence Spending, 1-3.

[15] Ibid, 22.

[16] K. Kak, "India's Conventional Defence: Problems and Prospects," *Strategic Analysis*, 22, no. 11 (February 1999), 18.

[17] V. K. Shrivastava, "Indian Air Force in the Years Ahead: An Army View," *Strategic Analysis*, 25, no. 8 (November 2001), 4.

[18] V. K. Shrivastava, "Indian Army: The Challenge Ahead," *Strategic Analysis*, 25, no. 4 (July 2001), 4.

The People's Liberation Army (PLA) has been modernizing its military over the past decade and can pose a serious threat to India in the future. China has initiated steps to establish new joint command structures, and has set in motion a series of measures designed to turn its armed forces into a modern juggernaut. China has initiated a doctrinal shift from "people's war under modern conditions" to "limited war under high-technology conditions".[19] Indians fear that China will continue to pose a strategic challenge to India. China's military modernization is set to add some 300 Su-30, 500 J-7/J-8 II/FC-1/J-10, AWACs, modern SAMs like the S-300s and a variety of Cruise Missiles in large numbers, which will shift the air power balance in the region.[20] Even though China's efforts may be concentrated against Taiwan, Indians fear that China's capabilities may be employed against India in the future.

Indians believe that China's strategic game plan is to keep India confined to South Asia.[21] To India's concern, as stated in the October 1999 Rand Report for the United States Air Force, is that China is not a satisfied power and refuses to abandon the principle of power. Given that India and China still have disputed territories along their borders and both countries have fought each other in the past, there is a distinct possibility that the two countries may go to war against each other in the future. Indians believe it is unlikely that China will relinquish claims on vast tracts of disputed territory along its border with India and in order to deter a military confrontation with China, India must achieve military parity with the Chinese. Therefore, the goal for the Indian military is to deter the Chinese from going to war with India and instead persuade them to pursue negotiations. Indian officials believe that their military force structure must be focused for a limited conventional war with China under high technology conditions. China has been upgrading its military technology and the Indians want to keep the technology gap from widening further, and hence want to pursue a military modernization policy to achieve parity with China. To the Indians the PLA objectives of gaining initiative by striking first and winning victory through elite troops indicate offensive intent. This

[19] Shrivastava, "Indian Air Force in the Years Ahead," 4.

[20] R. V. Phadke, "Response Options: Future of Indian Air Power Vision 2020," *Strategic Analysis*, 24, no. 10 (January 2001), 3.

[21] Shrivastava, "Indian Army 2020,", 3.

combined with People's Liberation Army Air Force's (PLAAF) transformation into a modern force capable of projecting force beyond mainland China is of significant security concern to the Indians.[22] In order to deter China from attacking, India is pursuing improved ISR – in order to identify and locate the threat, precision strike – for targeting capability and accuracy of its missiles, and missile defense – to defend against a possible missile attack from China.

2. Pakistan

Military tensions between India and Pakistan have been high. Since the last time the two countries fought a war in 1971 they have been involved in an intense acrimony over Kashmir, been involved in a low-intensity conflict in the Siachen Glacier region, gone through periodic crises over large-scale military exercises, and have participated in an armed conflict in the Kargil sector of Kashmir. Missile tests by both countries, including the reciprocated nuclear tests in 1998, have also heightened tensions between India and Pakistan.[23]

From the Indian perspective, Pakistan has been a relatively unstable country over the course of its existence. There have been several military coups and overthrows of governments. Having an unstable neighbor with the military at the helm will continue to be a concern for India. India and Pakistan have had a history of three wars, crises, and conflicts. Previous attempts at reconciliation – the Nehru-Liaqat agreement, the Simla agreement, the Lahore Declaration – have not produced any significant results. Indians believe that for the foreseeable future the Pakistani ruling elite is unlikely to change its attitudes and policies towards India, and tensions between the two countries will continue to mount.[24]

India perceives Pakistan to be spending a disproportionately high amount of money on its military in an attempt to maintain parity with the Indian military, and blames Pakistan's Inter-Services Intelligence (ISI) for subversive activities within Indian

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[22] Shrivastava, "Indian Air Force in the Years Ahead," 4.

[23] Basrur, R., "Missile Defense and South Asia: An Indian Perspective," in The Impact of US Ballistic Missile Defenses on Southern Asia, Michael Krepon and Chris Gagne, eds. (Washington, D.C.: The Henry L. Stimson Center, DATE), 15, http://www.stimson.org/southasia/pdf/SABMDBasrur.pdf

[24] Shrivastava, "Indian Army," 5.

borders to keep the Indian Army committed and reduce India's conventional edge against Pakistan.[25] India feels that in order to strengthen its tenuous national identity and strive for equivalence with India, Pakistan will continue to pose a confrontational posture against India for the next decade or two.

India feels threatened from the continuing cooperation between Pakistan and China. India foresees Pakistan to continue to modernize its air power and missiles from technology transfers through military cooperation with China.[26] Pakistan has enhanced its own strategic depth through acquisition of nuclear and IRBM capability with the assistance of China, and India expects Pakistan to further strengthen its conventional military structures through Chinese assistance.[27]

B. RIGHT TO ARM

Along with the perceived threats from China and Pakistan being the drive behind India's desire to modernize its ISR, precision strike, and missile defense capabilities, Indians also believe that as a growing economic power they have to protect their growing interests in the region.[28] Therefore, it is essential for the Indians to develop a military commensurate with its interests.

India's economy has been growing at a steady pace since it undertook economic reforms in the early 1990s. And as the economy has grown, so have its imports and exports, and the country's reliance on energy sources. It is important to India to be able to protect these interests for its economic security. This has been a drive behind India's overall military modernization.

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[25] Shrivastava, "Indian Army," 5.

[26] Phadke, "Response Options," 3.

[27] Kak, "India's Conventional Defence," 7.

[28] Interview with CDR P.K. Ghosh, United Service Institution of India, New Delhi, on 10 February 2005.

C. PREPARING FOR THE THREATS

1. Dissuade and Deter

Indians believe the best way to prevent war is through a strong and viable defensive posture of dissuasion and a potent and credible counter-offensive capability of deterrence.[29] Dissuasion implies a powerful defense that imposes significant losses on the attacker while limiting the intrusion into the defender's territory with only minimal losses to the defender. This makes the cost of potential gains for the aggressor extremely expensive and makes the whole endeavor seem pointless. Deterrence is predicated to possessing a counter-offensive capability that can inflict unacceptable losses on the attacker at a place of the defender's choosing. "The mere threat of a counter-offensive would deter the aggressor from embarking on changing the status quo. Such a strategy, with varying force mixes, is expected to shape force structures and weapon mixes as well. It applies both with regard to China and Pakistan."[30]

The 1991 Gulf War and the 1999 Kosovo air campaign highlighted the role of technology in air power.[31] India's military wants to build a strategic deterrence capability based on long-range precision strike fighter-bomber aircraft, cruise missiles and other land based missiles, and UAVs. They believe that having these capabilities will dissuade potential adversaries from attacking India. [32] Indian military thinking is that if India possesses a superior conventional capability than its adversaries, it will prevent India's adversaries from engaging in a war with India. "The implications of deterrence are to physically possess the requisite military capability (not capacity) and have the will to employ the same when needed. The adversary should be in the know on both counts."[33] India wants to pursue a doctrine of war prevention through conventional deterrence. To that end, the Indian government has reversed the trend of cuts in defense

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[29] Kak, "India's Conventional Defence," 5.

[30] Ibid, 5.

[31] Phadke, "Response Options," 1.

[32] Ibid, 1.

[33] Kak, "India's Conventional Defence," 4.

spending and has initiated defense modernization programs.[34] India's victory over Pakistan in 1971 was a validation for the maturity of India's acquired military capabilities in the wake of their military defeat at the hands of the Chinese in 1962, and the near stalemate with Pakistan in 1965. Indians believe that having a superior conventional military has resulted in the absence of major conventional wars in the region. "Dissuasion and deterrence have constituted key components of our defence strategy for over two decades… in the history of independent India, the period since 1971 has been the longest one when war has not occurred. It could be argued that perhaps the sufficiency of our military capabilities may have deterred war."[35] Therefore, the Indians want to modernize and maintain a military that is capable of dissuading and deterring potential aggressors.

2. Political Tool

The military exists to provide the leaders of a state with opportunities to accomplish their political goals. A military should have the means available to accomplish its military objectives, and be able to nudge the adversary towards the negotiating table.[36] Indian leadership believes that if they can create a military force overwhelmingly superior than their adversaries', it will force the adversaries to compromise since they will be out matched against the Indian military on a battlefield. Indians believe that it is their superior conventional capability that deters the Pakistanis from wanting to engage in a conventional war with India. From the Indian perspective it is imperative to achieve a military force capable of achieving its military objectives against an adversary, act as deterrence to the adversary due to their military capabilities and hence provide the politicians with a tool to achieve favorable outcomes during negotiations. Indians believe there is a trend towards military being used as an instrument for political purposes without an armed contest.[37]

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[34] K. Subrahmanyam, "Challenges to Indian Security," *Strategic Analysis*, 24, no. 9 (December 2000), 7.

[35] Kak, "India's Conventional Defence," 9.

[36] Shrivastava, "Indian Army 2020," 6.

[37] Kak, "India's Conventional Defence," 5.

3. Technology/Modernization

Influence of technology has altered the way wars have been fought throughout human history. Technological innovations have helped evolve new methods of engaging on the battlefield. Innovations in the use of catapults, horses, gunpowder have had tremendous affects on the way wars are fought and have had a significant affect on the course of human history. The twentieth century saw the continuing quest by mankind to fight wars with the assistance of modern technology.

The Indian military intends to raise its technological sophistication. They see the revolution in military affairs (RMA) as the future of war. The incorporation of emerging technologies into modern militaries is changing the nature of war. New technologies are increasing battlefield transparency, speeding up the process of making command decisions, and are enabling pinpoint destruction of targets at long ranges.[38] Conventional war with high technology platforms and weapons has become the object of desire for India since the Gulf War in 1991.[39] They are seeking capabilities in long range air power, airborne early warning, force multipliers, precision guided munitions, and UAVs among others. Success in the future conventional wars will depend upon possessing greater combat effectiveness potential, state-of-the-art reconnaissance, surveillance, target acquisition (RSTA) capabilities and domination offered by technology-intensive force multipliers.[40]

The Indian military foresees the need to acquire and modernize capabilities in ISR, precision strike, and missile defense. ISR will provide the Indian military with the capability to successfully detect the enemy forces and provide India with the ability to engage the enemy before he invades India. Precision strike will provide Indian military with an ability to parsimoniously target and destroy the enemy's high value assets and also provide the forces on the ground with close air support (CAS) and help them achieve their tactical goals while minimizing threat to the troops on the ground. The events during Kargil proved to the Indians the impact of air power in support of ground troops.

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[38] Shrivastava, "Indian Army 2020," 8.

[39] Kak, "India's Conventional Defence," 13.

[40] Ibid, 6.

Having a functioning missile defense capability will provide India with ability to minimize the threat its own targets and potentially defend its cities from a nuclear attack. Indians believe that having a strong military is vital for providing defense for its people and for providing India with stature.

D. KARGIL LESSONS LEARNED

One of the first steps towards achieving a military force that is capable of taking a proactive stance by taking the fight to the enemy instead of fighting on their own territory is having timely and reliable intelligence. India has not had a good track record of providing good intelligence, as was evident by a lack of indications and warning (I&W) during the events leading up to the Kargil crisis. Kargil was an example of an intelligence failure on the part of the Indians. Both sides had been exchanging fire in Jammu and Kashmir (J&K) for years and were aware of each other's intentions. However, Indian intelligence analysts, officials and officers were taken by surprise by Pakistan when Pakistani forces succeeded in infiltrating undetected into the disputed territory of Kargil.[41]

Indian military maintained patrols in the mountains after the positions were vacated for the winter to detect any Pakistani activity. On the first sign of any such activity, aerial reconnaissance would be established. India also maintained civilian and military intelligence organizations to conduct surveillance and reconnaissance in the Kargil region. Organizations like the Intelligence Bureau (IB), Research and Analysis Wing (R&AW), Border Security Force (BSF), Directorate General of Military Intelligence (DGMI) that had communications intelligence (COMINT), human intelligence (HUMINT), imagery intelligence (IMINT), and electronic intelligence (ELINT) assets at their disposal. In spite of all these assets and organizations, Indian reconnaissance efforts failed to detect large scale Pakistani intrusions into the Kargil region. "Pakistan had begun to move units into the region in December 1998 and by March 1999 Pakistanis had established 132 posts inside Indian Territory covering an area

[41] J. Wirtz and S. Rana, "Surprise at the Top of the World," in Asymmetric Warfare in South Asia: Causes and Consequences of the 1999 Kargil Conflict, Peter Lavoy, ed. (forthcoming, 2005), 1.

of 100km in width to 7-15km in depth."[42] The Kargil Review Committee, established to investigate the failure of Indian intelligence during the events leading up to the Kargil Crisis placed blame on the intelligence community's collection capabilities. The committee noted that if India had a half-meter resolution satellite imagery capability, unmanned aerial vehicles (UAVs), and better HUMINT, then Kargil might have been prevented.[43] The recommendations placed emphasis to enhance intelligence capabilities through technical means.[44]

E. INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE

Armed forces and military planners have sought accurate and timely information throughout history. Genghis Khan used to employ horse cavalry in outflanking forays against enemy dispositions to gather vital information before the main offensive. Today, there are technological means to gather information against the enemy. ISR technologies, satellites, and radars provide military leaders with highly accurate intelligence and enhance the situational awareness by several orders of magnitude. [45] Technologies in obtaining intelligence, carrying out surveillance, reconnaissance and tracking friendly forces have resulted in the current battlespace encompassing advanced surveillance and target acquisition technologies like battlefield surveillance radars, mortar locating radars and various other kinds of surveillance radars and sensors. These advances in ISR technologies are making the battlespace more transparent. [46]

In most of the conflicts India has been involved in since its independence, Indian military forces have been subjected to surprise. The 1947 incursion in J&K, the 1962 attack by China, the 1965 infiltration in the Kashmir Valley by Pakistani forces, and the 1999 Kargil incident were all a result of the failure by Indian military to conduct effective

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[42] Wirtz and Rana, "Surprise at the Top of the World," 9.

[43] Ibid, 10.

[44] R. Basrur, "The Lessons of Kargil as Learned by India," in Asymmetric Warfare in South Asia: Causes and Consequences of the 1999 Kargil Conflict, Peter Lavoy, ed. (forthcoming, 2005), 12.

[45] K. Kak, "Revolution in Military Affairs: An Appraisal," *Strategic Analysis*, 24, no. 1 (April 2000), 5.

[46] V. Anand, "Future Battlespace and Need for Jointmanship," *Strategic Analysis*, 23, no. 10 (January 2000), 5.

surveillance and reconnaissance.[47] In order for India to avoid surprises by its adversaries in the future, Indians believe they need to develop, maintain and continuously fine-tune their surveillance and reconnaissance assets, both air and space based.[48]

The Indian Army continues to be involved in near-warlike situation along the line of control (LoC) in Kashmir and along the Sino-Indian borders. From the Indian Army's perspective the Indian Air Force needs to provide greater all-weather surveillance and operational intelligence. Indians foresee the shift in the Chinese armed forces doctrine towards preemptive surprise attacks in a local border war as a potential threat to Indian security and want to establish a reliable ISR system.[49] Indians cite the example of the 1982 Bekaa Valley operations to show how airborne ISR through the employment of AWACS, electronic warfare, unmanned aircraft and sensors can provide an advantage over an adversary. [50] The Indian military is on a quest to attain an ISR capability based on technologies in radars, electro-optical sensors, electronic intelligence, and imagery. These technologies are improving ISR capabilities and will lead to easier detection of enemy disposition and hence make them more vulnerable. Indians believe that having AWACS capability is absolutely essential for air defense. "While the AWACs will extend our air defence cover, they will also preclude nasty surprises, enlarge the operating envelope of our offensive elements, reduce attrition by timely warning, improve our ELINT capability."[51]

Employment of UAVs, aircraft and satellite systems will be needed to attain an effective ISR capability. Indian officials believe that UAVs are a potential economic solution for improving their ISR capabilities.[52] India is interested in the UAVs for their ability to loiter for long periods of time at high altitudes. India is cognizant of the U.S. Global Hawk UAV, which has completed a trans-Atlantic flight and has an endurance of

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[47] K. Kak, "A Century of Air Power: Lessons and Pointers," *Strategic Analysis*, 24, no. 12 (March 2001), 9.

[48] Phadke, "Response Options," 4.

[49] Ibid, 7.

[50] Kak, "A Century of Air Power," 4.

[51] Phadke, "Response Options," 7.

[52] Ibid, 7.

forty-two hours at over 60,000 feet.[53] Indian military wants to pursue UAVs to attain the capability to conduct surveillance and reconnaissance, and gather intelligence over enemy territory without any risk to personnel.

Indian officials recognized the important contributions of satellites during the Gulf War. They understand that satellites can support and enhance traditional air operations. "The application of GPS to aircraft navigation and weapon guidance could confer all weather capabilities on PGMs…Satellite surveillance by optical, infra-red and radar technology will continue to provide strategic intelligence."[54] Indian military is making efforts to obtain dedicated military satellites for ISR, target acquisition systems, and airborne early warning platforms for early detection of missile launch site preparations, for ground, air, and maritime forces deployments, and for indications and warnings (I&W).[55] India's limitations in ISR during the Kargil Crisis are being addressed by the Indians.

Another lesson learned by the Indian military from the Gulf War was recognizing the role ISR can play in battle damage assessment (BDA). Having an accurate assessment of the BDA supports the forces in the battlefield by providing them with information on targets and helps determine possible courses of action.

After observing the success of the United States in the Gulf War, Indians foresee a greater role for ISR and precision strike capabilities in the future air force. "The stunning victory of the western armed forces and their allies in the Gulf War of 1991 could doubtless be ascribed to the efficacy, reach and lethality of air power which has taken a quantum jump through employment of significant force multipliers like Airborne Warning and Control System (AWACS), Joint Surveillance Target Attack Radar System (JSTARS), Joint Tactical Information Distribution system (JTIDS), in-flight refueling, satellite aided navigation, precision-force technologies etc."[56] Indians believe the shift of ISR capabilities from land based platforms to air and space based platforms is

[53]Phadke, "Response Options," 6.

[54] Kak, "A Century of Air Power," 10.

[55] Kak, "India's Conventional Defence," 17.

[56] Kak, "An Appraisal," 3.

revolutionizing the intelligence gathering techniques and the Indian military has to obtain these capabilities.

F. PRECISION STRIKE

The quest for improved accuracy and longer range weapons has been present among the armed forces throughout history. Rifling in the 19th century extended the range and accuracy of guns, and the introduction of tanks and aircraft stretched the length of the battlefields.[57] Indians believe there is a discernible trend towards an enhanced role for combat power with long range strike proficiencies and all-weather day and night capabilities to strike targets selectively and with discrimination.[58] India foresees a greater role for air power and precision firepower in the future. During the Gulf War, the U.S.-led coalition forces ensured air superiority to achieve an advantage for the remainder of air, maritime and land operations.[59] Targeting of key military and command and control (C2) centers through the employment of precision strikes during the Gulf War provided the Indians with an example of the importance of strategic air offensive with focused precision strikes, and a model to emulate.

Indians believe that the quality of an armed force is more important than the number of weapons it carries. "[P]latforms like aircraft, ships, tanks and guns etc will be less reflective of military power than the quality of what it carries by way of sensors, munitions, avionic suites, communications etc. The first long-range precision strike may prove decisive as happened to the Iraqi air defence system during the Gulf War."[60] The Indians have also learned the importance of precision strike capability from observing the U.S. military's use of long-range precision firepower, like the Tomahawk cruise missile, against Usama bin-Ladin's camps in Afghanistan. Technological trends such as long range precision strikes and force multipliers are becoming increasingly dominant for

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[57] Anand, "Future Battlespace," 3.

[58] Kak, "India's Conventional Defence," 5.

[59] Kak, "A Century of Air Power," 4.

[60] Kak, "An Appraisal," 6.

conduct of warfare in the foreseeable future and are impacting the battlespace.[61] Having precision strike capability will provide the Indian military with the ability to conduct focused strikes with a parsimonious employment of weapons. There is a heightened interest in India in obtaining "robot-planes" to strike deep into enemy territory. This would provide India with the capability to conduct precision strikes against an advisory without any risk to their own personnel. Indians believe that future crises will demand surgical strikes against certain target systems to forestall a war. To accomplish this in an efficient, effective, and parsimonious manner, precision guided munitions and platforms are necessary. Obtaining and maintaining a long-range precision strike capability is also critical for India since it is the only reliable platform for India's minimum credible nuclear deterrent.[62]

The advantages of precision strikes are apparent when comparisons are made between air strike operations from World War II (WWII), the Vietnam War and the Gulf War. To achieve an equivalent target destruction of 4,500 B-17 sorties during WWII, 95 F-105 sorties were needed during the Vietnam War, and only one F-117 sortie was required during the Gulf War. Four advanced fighter aircraft can achieve the same damage today as 568 strategic bombing missions by the Allies in WWII achieved over one year. A U.S. DOD summary compared the accuracy probability figures of the B17 to be 3,300 ft, the F-105 to be 400 ft, the F16 to be 200 ft, and the F 117 to be less than 10 ft.[63] This reduction of aircraft requirements and increased effectiveness result in greater savings for the military and higher operational efficiency. "In a hot war, air interdiction against strategic targets such as power grids, communication networks and their key nodal points would require multi node aircraft with PGMs, or ALCMs for long-range precision strikes. India's air power cannot afford not to have such a capability."[64]

The Indian military wants to attain a military capable of joint operations. To this end, they want the Indian Army and the Indian Air Force to be able to conduct cohesive

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[61] Anand, "Future Battlespace," 3.

[62] Phadke, "Response Options," 3.

[63] Kak, "A Century of Air Power," 7.

[64] Ibid, 7.

operations. For the future, the Indians foresee the use of air power in coordination with friendly surface force and tactical reconnaissance as part of the missions for the Air Force.[65] They view the ground and air forces working in conjunction with each other in the future conventional battlefield. This will increase the necessity for the air force to be able to provide close air support (CAS) to the ground forces, and also conduct surveillance and reconnaissance to attain intelligence on enemy disposition. These will be critical roles for the air force on which the Indians believe the success of future military operations will depend.

The Indian military also foresees a counter-intelligence (CI) role for the IAF. From the Indian perspective, the infiltration into Kashmir by "terrorists" is of grave concern and the IAF can play a role in countering the problem. The IAF can be used to "hound and pound the terrorists and the insurgents in their hideouts. Further, and more importantly, should the situation so demand, the Army would want the Air Force to stand ready to hit at the terrorist bases and launch-pads across the LoC."[66] This role for the IAF can be best addressed by incorporating the application of precision guided munitions (PGMs).

India's use of laser guided bombs against the Pakistani forces during the Kargil Crisis, and the success of the precision technologies has reinforced to the Indians the need for greater incorporation of precision firepower into their military for the future. "The future sub-continental battlespace will be dominated by a wide variety of platforms and delivery means …with increased ranges and accuracy, terminally guided munitions, precision guided munitions and improved tanks and aircrafts with precision capabilities."[67] The induction of state-of-the-art anti-tank guided missiles, laser-aimed weapons, laser target designators and the development of smart munitions by the Indians confirms the trend towards precision fire.

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[65] Kak, "A Century of Air Power," 7.

[66] Shrivastava, "Indian Air Force in the Years Ahead," 8.

[67] Anand, "Future Battlespace," 3.

The nature of war demands a quick induction of massive firepower. Long range precision munitions can be used to "soften" the target without any risk to friendly forces. It can be used to attack the enemy's high value assets, like the command and control and platforms and missile sites, and also provide close air support to the ground forces and help minimize the threat to friendly troops on the ground.

G. MISSILE DEFENSE

Indian interest has revolved around missile defense related developments for several years. Missile defense became an issue for Asian countries after China launched missiles in the Taiwan Strait in 1995 and 1996, and after North Korea launched a Taepodong missile in 1998. Although these events did not affect India directly, they made India more aware of the threat. The use of Tomahawk missiles in Afghanistan and Kosovo by the U.S. increased India's general sense of unease. These concerns became more serious for India following reports about the transfer of Chinese M-11 missiles to Pakistan and the deployment of Chinese nuclear missiles in Tibet.[68]

India views itself as having been under a nuclear threat for decades. Initially the threat was only from China and then from China's proliferation of nuclear weapons capability to Pakistan.[69] According to India, Pakistan's drive to obtain nuclear weapons has been most importantly to counter India's superior conventional capabilities that became apparent following the 1971 war. On October 5, 1999, Pakistan's Foreign Minister Abdul Sattar disclosed, in News International, that Pakistan conceived its nuclear weapons program in the wake of its defeat in 1971 war and it was India-specific.[70] Indians cite the 1998 nuclear tests by Pakistan following the tests by India as an example of Pakistan's nuclear program being India-specific. Indians believe that Pakistan will continue to obtain required material for its nuclear and missile manufacturing facilities without hindrance and has the capability and intentions to employ nuclear weapons against the Indians if needed. And ignoring this threat will

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[68] R. Basrur, "Missile Defense and South Asia: An Indian Perspective," 14.

[69] C. Raja Mohan, *Crossing the Rubicon* (New York: Palgrave MacMillan, 2004), 23.

[70] Subrahmanyam, "Challenges to Indian Security," 2.

jeopardize India's security, safety and interests.[71] Indians believe that it is a moral imperative to pursue missile defense capability since it attempts to save human lives.[72]

Pakistan also upholds the policy of first use of nuclear weapons, which necessitates its arsenal to remain in a state of readiness. This has forced India to acquire or build the attendant paraphernalia such as early warning capabilities and to build security measures for its own safety.[73] This denial by Pakistan to adhere to the no first use policy and minimum credible nuclear deterrence is perceived by Indians as a negative attitude towards an important nuclear confidence-building measure and exposes a mindset that considers nuclear weapons as weapons of war.[74] And India's own no-first-use (NFU) policy, combined with Pakistan's refusal to employ the same policy, has driven India to pursue missile defense capability. Indians perceive this as hostile intent and believe they have a need to protect themselves against this possible aggressive threat from Pakistan.[75]

India's primary defense against an attack is its pursuit of superior military capability, but Indians want to pursue missile defense capability to provide security in case its deterrence fails. Having a missile defense capability can limit damage if an adversary can not be deterred and engages in a suicidal attack.[76] There is also the possibility of an inadvertent or accidental use of nuclear weapons. An unintended use could occur either because of improper judgment by the political leadership (such as through an unintended or inadvertent escalation), or use without the concurrence of the political leadership (such as unauthorized use by military commanders), or because of

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[71] M. Rappai, "China's Nuclear Arsenal and Missile Defence," *Strategic Analysis*, 26, no. 1 (Jan-Mar 2002), 11.

[72] R. Basrur, "Missile Defense and South Asia: An Indian Perspective," 13.

[73] M. Sethi, "Dangers From Weapons of Mass Destruction: Any Different in South Asia," *Strategic Analysis*, 26, no. 11 (February 2001), 10.

[74] P. Ghosh, "India-Pakistan Nuclear Parity: Is it Feasible or Necessary?" *Strategic Analysis*, 25, no. 4 (July 2001), 4.

[75] Interview with Brig. Gurmeet Kanwal (Retd.), Observer Research Foundation, New Delhi, on 7 February 2005.

[76] R. Basrur, "Missile Defense and South Asia: An Indian Perspective", 10, 16.

inadequate safety measures leading to an accident.[77] India is especially concerned about an unauthorized use of nuclear weapons by a military commander in Pakistan, given that nuclear weapons are under the control of the military and not civilian authorities in Pakistan. The Indian leadership believes there is also the possibility of an unintended use of nuclear weapons and India must take defensive measures against such possibilities.

Pakistan has developed a significant and reliable "diad" delivery system for its nuclear arsenal. It has both aircraft capable delivery systems and land-based missiles. Pakistan has both liquid fuelled missiles and solid fuelled missiles, and these missiles have been tested and proven reliable. Pakistan's liquid fuelled Ghauri II ballistic missiles, with a range of 2,000km, are capable of delivering nuclear warheads on key Indian cities from deep inside Pakistani territory. Pakistan's capability to deliver nuclear weapons to key Indian cities is another reason why Indians feel a need for missile defense. Even though a missile defense system will not be able to protect all Indian cities, nor will it be able to provide 100 percent protection against a missile attack, the Indian officials believe that they must make efforts to provide the highest level of protection to the population.

The Chinese consider their nuclear forces an "important pillar" of their status and stability.[78] Indians feel that the decision by the U.S. to pursue ballistic missile defense (BMD) is likely to compel China to adopt counter-BMD measures by embarking on a qualitative and quantitative nuclear arsenal. This will likely entail an expanded arsenal, multiple-warhead missiles and the adoption of an alert posture. The critics of the U.S. policy to pursue national missile defense, including former Secretary of State Madeleine Albright, echo this view. "Indians also fear that a China antagonized by American missile defense may draw even closer to Pakistan and accelerate strategic cooperation with it." [79] The Director General of the Chinese Foreign Ministry's Department of Arms Control and Disarmament, Ambassador Sha Zukang, has said that "China will do

[77] Sethi, "Dangers From Weapons of Mass Destruction," 4.

[78] Shrivastava, "Indian Air Force in the Years Ahead," 3.

[79] R. Basrur, "Missile Defense and South Asia: An Indian Perspective," 6.

everything possible to ensure its security, and the measures it will take will be in proportion to the success of [national missile defence]."[80]

Indians foresee an increasing missile threat to their security vis-à-vis China. The Chinese are developing their cruise missile capabilities. The HN-1A is the ground-launched version of the HN-1B, which is an air launched cruise missile with a range of 600Km. These are reportedly capable of carrying a 90 kT nuclear or a 400-kg conventional warhead. HN-2 and HN-3 with 1400 and 1800 Km ranges are reportedly under development. [81] Indians believe that Chinese collaboration with Russia has significantly improved Chinese missiles, and Pakistan will benefit from this improved capability as well. [82] This makes procuring a functional missile defense system critical to India for its security.

Indians believe that the Chinese possess a significant number of tactical nuclear weapons used for nuclear war-fighting, indicating a shift in Chinese nuclear doctrine and strategy.[83] The implications for peace and security in Asia to the Indians may be gauged from the fact that over 98 per cent of China's nuclear weapons have relevance only for the countries on its periphery in Asia.[84] Given the Indian perception that most of China's nuclear arsenal is in fact specific to countries like India, the Indians believe it is in their self-interest to be able to counter this threat.

China also maintains its nuclear arsenal in a deployed status and its delivery capabilities are assessed to be reliable and better than those of India. China also maintains only a conditional no first use policy. "China has taken pains to point out that its no first use would not apply to territories it claims as its own…"[85] This is a definite

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[80] Sethi, "Dangers From Weapons of Mass Destruction," 4.

[81] Phadke, "Response Options," 7.

[82] Phadke, "Response Options," 8.

[83] J. Singh, "Towards A Safer Asia: An Indian Perspective," *Strategic Analysis*, 23, no. 1 (April 1999), 3.

[84] Ibid, 3.

[85] Sethi, "Dangers From Weapons of Mass Destruction," 11.

cause for concern for India given that the two countries have unresolved territorial claims in the Indian northeastern states and the upper Himalayan reaches.

Unlike against Pakistan, India does not currently possess a deliverable nuclear deterrent against the Chinese, which makes pursuing a missile defense system even more critical from security perspective. "[N]one of these systems can provide an effective deterrent against the Chinese until a longer range Agni (at least Agni III with a range of 3,500 km) is operationalised."[86]

Another reason behind India's motivation for missile defense has been political. The Bharatiya Janta Party (BJP) backed Indian government was one of the first to back at least parts of President Bush's national missile defense initiative unveiled in May 2001. BJP wanted to use this as a tool for building cooperation between India and the United States. India's inability to test nuclear weapons before January 1st, 1968 made it impossible for India to be accepted as a legitimate nuclear weapons power, and Indian officials hoped to open the door to addressing India's issues with the global nuclear order and India's place in it by backing the United States initiative. This initiative by the Bush administration to rework the global nuclear order was seen by the BJP leaders as providing an opportunity for India to become part of the making of a new system of nuclear rules.[87]

Another political perspective for pursuing missile defense capability has been domestic politics. Indian leaders, like in any other democratic country, have to appease their constituents in order to get reelected. And the Indian populace wants to know that their government is doing whatever it can to protect the people from a potential missile threat.[88] Therefore, in order to provide the people a sense of security, the Indian government has chosen to pursue missile defense technologies.

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[86] Ghosh, "India-Pakistan Nuclear Parity," 4.

[87] Mohan, *Crossing the Rubicon*, 21.

[88] Interview with Brig. Gurmeet Kanwal (Retd.), Observer Research Foundation, New Delhi, on 7 February 2005.

Indians foresee the future leadership of Asia to be decided between China and India. This may not happen in the near future but it is perceived as an eventuality. In the meantime, Indians believe it is in their own interest to pursue missile defense technology.

H. CONCLUSION

Indian military efforts in recent years to modernize its ISR, precision strike, and missile defense capabilities are largely driven by their perception of threat from China and Pakistan. Their own experiences during past conflicts, like the Kargil Crisis, have contributed to the Indian military's desires to modernize its military capabilities. Indians believe that attaining long range precision strike technologies will increase India's deterrent capability, and obtaining UAVs and satellites will reinforce current ISR capabilities.[89] Obtaining an improved ISR capability for an enhanced situational awareness and accurate intelligence combined with long range precision weapons can inflict unprecedented levels of destruction on an adversary. Having these capabilities can provide a significant advantage over the enemy in an engagement. An accurate and enhanced ISR capability can also prevent a conflict from escalating by providing information to better prepare defensive forces. Long range precision weapons can act as a deterrent to a potential attacker who may be concerned about suffering significant loses. If, however, the deterrent fails, Indians believe it is in their security interest to pursue missile defense capability to counter any missile threats to India.

[89] Phadke, "Response Options," 11.

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III. INDIA'S ISR, PRECISION STRIKE, AND MISSILE DEFENSE MODERNIZATION EFFORTS

India has made a concerted effort since the late-1990s to modernize its ISR, precision strike, and missile defense capabilities to counter the perceived threats from China and Pakistan. The Indian military is making significant progress in acquiring and developing sophisticated platforms. In order to improve its ISR, which was a lesson learned during the Kargil Crisis, the Indian military has procured the Phalcon AWACS (Airborne Warning and Control System) and Unmanned Aerial Vehicles (UAVs) along with other platforms. To improve its offensive capability and accuracy for deterrence, India is focusing on improving its precision strike capabilities through the acquisition of, among other things, the Sukhoi Su-30MKI (Russian acronym for Multirole, Commercial, Indian) advanced combat fighter and the Rafael Litening targeting pod. To defend against inbound missiles, India is attempting to procure a missile defense system with the purchase of systems like the Israeli Barak anti-missile missile system and the Russian S-300PMU air defense system. This chapter focuses on the efforts being undertaken by the Indian military to modernize its ISR, precision strike, and missile defense, and the capabilities they provide the Indian military. It is important to evaluate the efforts undertaken by India and their affects to understand what possible consequences they may have on the stability of the region (as will be discussed in the next chapter).

India is indigenously developing and acquiring foreign weapons systems to deter aggressive actions from both China and Pakistan. It also wants to be able to protect itself against a missile attack and maintain an offensive strike capability for possible punitive actions in case of another Kargil-like scenario. To accomplish these goals, India is concentrating on acquiring some key weapons systems to improve its ISR, precision strike, and missile defense capabilities. To improve its ISR capabilities, India is focusing its acquisition and development efforts on the Phalcon AWACS, Surveillance radars (PIN521 and the battlefield surveillance system), AN-TPQ/37 weapon locating radar, UAVs, satellites, and maritime surveillance aircraft (TU-142, IL-38, TU-22, P-3s). The Sukhoi Su-30MKI advanced combat fighter, Mirage 2000-5, upgrade of the Jaguar and

the MiG-27, KONKURS-M and Nag anti-tank guided weapon system, Krasnopol 152/155mm guided artillery weapon, Vikhr multi-purpose guided weapon, Rafael litening targeting pod are all platforms that are expected to provide India with an improved precision strike capabilities. And in order to obtain a missile defense capability, India is on a quest to procure the Barak anti-missile missile system, the Greenpine radar system, the Arrow anti-missile system, the Antey 2500 anti-ballistic missile (ABM) launchers, and the S-300PMU air defense system.[90]

This chapter presents the weapons systems India is procuring and the role they will play in improving the Indian military's ISR, precision strike, and missile defense capabilities. Understanding the effects of these weapons systems on the Indian military's capabilities is vital in evaluating how Pakistan might react to these efforts by India, which is critical in understanding how the stability in South Asia may be affected by India's modernization efforts. First, what efforts India has undertaken to improve its ISR and how they will affect India's ISR capabilities is presented. This is followed by precision strike and then missile defense efforts undertaken by India and their affect on India's capabilities.

A. ISR

The drive behind India's desire for an improved ISR capability has been the intelligence, surveillance and reconnaissance failures of the Indian military in the past. There are several examples of this, including the 1947 incursion in J&K where Pakistani "forces" were able to avoid surveillance and infiltrate without being detected. The 1962 attack by China was a complete surprise to the Indians and an intelligence failure. The 1965 infiltration in the Kashmir Valley by Pakistani forces and the 1999 Kargil incident are both examples of surveillance and reconnaissance failures on the part of the Indians which allowed Pakistani forces to infiltrate into Indian territory undetected.[91] A lack of a functional ISR has subjected the Indian military to surprise attacks in the past, and there

[90] Lt. General (Ret.) R.K. Jasbir Singh, ed. *Indian Defense Yearbook 2004* (Dehra Dun, India: Natraj Publishers, 2004), 304, 340, 421, 437, 512, 514.

[91] Kapil Kak, "A Century of Air Power: Lessons and Pointers," *Strategic Analysis*, 24, no. 12 (March 2001), 9.

has been a concerted effort to avoid the same mistakes in the future by improving its ISR capabilities. The thrust of India's efforts for improving its ISR capabilities is a mix of indigenous development and foreign acquisition. India has launched technological empowerment programs for the development of technologies and systems, and has simultaneously initiated an aggressive foreign technology procurement program. This has resulted in India obtaining the Phalcon AWACS, several surveillance and weapon locating radars, maritime surveillance aircraft, UAVs, and satellites.

1. Phalcon AWACS

The Phalcon AWACS encompasses the thrust of India's ISR improvement efforts. The Israeli government approved a US $1.1 billion deal in October 2003 to export its Phalcon airborne early warning system to India. According to the deal, Israel will purchase three IL-76 transports from Ukraine, and following avionics and more powerful engines upgrades in Russia, Israel will integrate the Phalcon radar suite in the aircraft. The first complete system is expected to be in service by the end of 2006, with the completion of the contract by 2009/2010.[92] The Phalcon has the capability to conduct both communications intelligence (COMINT) and electronic intelligence (ELINT) electronic support measures.[93] The Phalcon airborne early warning system will be able to monitor air space activity out to the range of 500 km, and will be able to track up to 100 targets, provide real time data to Indian combat fighters, and transmit information directly to ground stations.[94] India foresees the Phalcon airborne early warning system as an ISR platform that will maximize India's air defense capability by improving its ability to coordinate air strikes through an increased capability to detect aerial threats, and by directing Indian combat aircraft to potential targets.

The addition of the Phalcon AWACS will provide the Indian military with the ability to track Pakistani aircraft that enter Indian airspace and guide IAF fighters to intercept them. This is a significant advantage for the Indians since it can potentially neutralize Pakistan's capability to deliver weapons on Indian targets via aircraft. The

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[92] *Jane's Sentinel Security Assessment – South Asia*, 1 February 2005, http://www4.janes.com/K2/doc.jsp.

[93] *Jane's Electronic Mission Aircraft 02*, 15 January 1999, http://www4.janes.com/K2/doc.jsp.

[94] "Article Examines Purchase of Israeli Radar Against India's Air Defense Network," FBIS.

Phalcon AWACS will also provide the Indian military with the capability to conduct ISR operations well inside Pakistan's territory and conduct air operations against Pakistan by providing fighter aircraft with real time targeting data on Pakistani targets.

Another reason for the Indian military to acquire the Phalcon AWACS was to fill the ISR gap in the Himalayas. The Phalcon system is capable of detecting enemy aircraft in all weather, day or night, and even at low altitude.[95] The advanced warning Phalcon will be of great tactical significance in a confrontation with China. Having the ability to detect a Chinese attack early will provide India with the intelligence that could potentially be the difference between successfully encountering the threat and losing a battle. The Phalcon AWACS gives India the early warning it needs to properly defend itself against potential surprises along the Himalayas.[96]

2. Other ISR Efforts

a. Radars

PIN 521 surveillance radar is an active and passive radar for navigation and attack. It is designed to detect surface targets and autonomously furnish the target data directly to the weapon control system for missile firing at the targets.[97]

The battlefield surveillance system (BSS), currently under development, is a state-of-the-art surveillance system that can be used for ground surveillance of a large area of the order of 300x300 km. The BSS will provide surveillance of the entire battlefield in all weather conditions, and automatically transmit information via radio links.[98]

b. AN-TPQ/37 Weapon Locating Radar

The Indian Army took delivery from the United States of two "Firefinder" counter-battery radar systems on 10 July 2003. Under the Indo-U.S. military sales agreement the United States will provide 12 AN-TPQ/37 radar systems to India,

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[95] Biman Mukherji, "India and Israel Sign One Billion Dollar Defense Deal," *Agence France Presse*, 05 March 2004. Accessed via the Internet on LexisNexis at http://www.nexis.com on 10 June 2004.

[96] Air Commodore Ramesh V. Phadke, (Working paper) Center for International Security and Cooperation (CISAC), Stanford University, entitled, "People's Liberation Army Air Force (PLAAF): Shifting Airpower Balance and Challenges to India's Security," February 2002, p. 20.

[97] Singh, 514.

[98] Ibid, 512.

scheduled to commence in September 2004 and be completed over two years.[99] The radar system uses a combination of radar techniques and computer functions to detect and accurately locate the point of origin of an artillery, mortar, rocket launchers and missiles to permit tracking and rapid engagement with counter-fire.[100]

India's efforts to procure these radars have been an attempt to obtain the capability to achieve a complete ISR coverage of potential future battlefields. The surveillance radars the Indian military is procuring are fully integrated systems that are capable of detecting and tracking targets, and also furnish the information to the weapons systems for firing solutions. This will provide India with a significant improvement over its current ISR capability by not just detecting targets but also by responding to them in an effective and lethal manner. This is a significant step for India towards improving its tactical ISR capability through which India hopes to avoid future surveillance and reconnaissance failures.

c. Maritime Surveillance Aircraft (TU-142, IL-38, TU-22, P-3s)

Improving its ISR is part of the Indian Navy's wish list as well. The Indian Navy is looking to procure maritime reconnaissance aircraft and is also modernizing its fleet of IL-38 reconnaissance aircraft. Negotiations have been taking place with the United States to buy eight used P-3 Orion surveillance aircraft, under the U.S. foreign military sales program; and reportedly the U.S. government recently approved the sale of the aircraft to India by Lockheed Martin. The exact details of the sale are still to be negotiated.[101] Acquiring the P-3s is important for the Indian Navy since Russia has held back the Indian Navy's lease of four Tu-22 Backfire bombers that were expected to fill the reconnaissance role. Eight of Indian Navy's Tu-142 maritime aircraft and the three remaining IL-38's are poised for upgrade in Russia. The Indian Navy continues to strive for an improved ISR capability to supplement India's overall military ISR capability.

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[99] Singh, 304.

[100] *Jane's Radar and Electronic Warfare Systems*, 26 October 2004, http://www4.janes.com/K2/doc.jsp.

[101] Staff Reporter. "Lockheed Martin to Sell Surveillance Aircraft to India." *The Hindu* February 2005: not available. Database on-line. Available from http://www.thehindu.com/2005/02/11/stories/2005021114281200.htm [11 February 2005].

3. UAVs and Satellites

The final component in the quest for achieving a competent and significant ISR capability is procuring and developing UAVs and satellites. India is involved in purchase negotiations with Russia, Germany, Austria, United States, Switzerland, Israel and South Africa for UAVs. High altitude UAVs are required in Jammu and Kashmir since they are the best platform to conduct ISR operations in the mountainous terrain of the Himalayas where surface radars are of little use. India has already acquired Israeli-built Searcher-II and Heron UAVs. The Indian Army has ordered 18 Heron UAVs, scheduled to be delivered this year, and the IAF was expected to order 16 more. The Indian Navy also has ordered four Heron and eight Searcher UAVs. The Heron is an operational fourth-generation, medium-altitude long endurance, no visibility, no sound signature system with endurance of up to 36 hours of continuous flight that provides deep penetration, wide area, real time ISR to national agencies and theater commanders for intelligence preparation of the battlefield, target acquisition and directing fire on targets. The Searcher-II is an all-weather, high-altitude UAV with a height ceiling of nearly 30,000 feet. India is also attempting to acquire low-altitude, short-range UAVs for tactical use to obtain timely ISR for the commanders in the battlefield. The UAVs will provide an intelligence, surveillance, and reconnaissance role, improve India's target acquisition capability and help direct accurate fire on enemy targets in the battlefield.[102]

Over the last three decades, India has achieved notable progress in the design, development and operation of space systems, and India's surveillance capabilities have been significantly enhanced with the launch of the IRS-TES (Indian Remote Sensing–Technology Experiment Satellite) satellite. The TES carries a panchromatic camera with a spatial resolution of one meter and provides the Indian space program with a potential to place several highly effective ISR platforms in space in the near future.[103] The launch of the TES in October 2001 signified a new dimension in India's ISR capability. Having a space based ISR platform makes the targets in Pakistan more vulnerable to targeting by India and also provides the Indian military an effective indications and warning (I&W)

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[102] Singh, 421.

[103] Singh, 424.

platform. This is a significant advantage for India over its adversary since an improved I&W capability provides India with an opportunity to effectively respond prior to a potential strike by Pakistan or China, thereby avoiding potentially devastating loses. Satellites can also provide India with target acquisition of targets deep in Pakistan's territory, which were previously not within India's capability to acquire.

India also is seeking to obtain access to Israel's super-high resolution imagery from its Ofeq-5 spy satellite. The actual performance specifications of the satellite are classified, but it is assumed to be capable of capturing details much less than half-meter across. India is also pursuing joint satellite ventures with Israel that will help thrust India's space based ISR program. The IAF is striving to be able to launch a dedicated satellite for the armed forces in the near future to cater to reconnaissance and real-time intelligence needs. For its long-term goal, the IAF has started to work on conceptualizing weapon systems for space, with an eventual goal of UAVs and satellite technology-based laser weapon systems.[104]

A remotely piloted vehicle, Nishant, has been developed by the Defense Research and Development Organization (DRDO) for the Indian Army (IA).[105] The Nishant will be able to provide battlefield surveillance and reconnaissance for target acquisition and target tracking, real time engagement of targets by artillery fire, and damage assessment. More than 84 development flights have been carried out and the IA has decided to go in for induction of Nishant through limited series production.[106]

The pursuit of improved ISR capability by the Indian military has been motivated largely by its repeated I&W failures during past wars to pick up threats in a timely manner and prevent surprise attacks by its adversaries. Driven by the desire to prevent future surprises, India is well on its way to achieving the goal of increasing its ISR capabilities. A spectrum of radars, surveillance and reconnaissance platforms, UAVs and satellites is significantly improving India's technological capabilities to conduct ISR.

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[104]Singh, 334, 336.

[105] *Army buying 12 Nishant UAVs for surveillance: DRDO,* accessed from the internet on 01 March 2005, at website http://news.indiainfo.com/2005/02/11/1102nishant.html.

[106] Singh, 538.

B. PRECISION STRIKE

This section will present the precision strike platforms India has procured and developed, and the capabilities these platforms provide the Indian military in its quest to upgrade its precision strike capabilities. The Indian military wants to attain a precision strike capability based on high-technology as part of its strategic deterrence capability. The 1991 Gulf War and the 1999 Kosovo air campaign highlighted the role of technology in air power.[107] Indian military wants to possess a credible counter-offensive capability based on precision strike, which is designed to act in tandem with India's developing ISR capability. The sophisticated ISR platforms are designed to provide real time information on the adversary, and the precision strike capability will deliver a response inflicting severe damage to the enemy through accurate delivery of weapons on target. This capability to deliver a severe and accurate response is expected to deter future wars by ensuring harsh repercussions on the attacker. Having the capability for accurate surgical strikes against particular targets will be key for the Indian military to forestall future crises from developing into wars, and precision guided munitions and platforms are paramount to accomplish that mission. A lack of precision strike capabilities was exposed during Operation Parakram in 2002.[108] This was evident in the fact that India's military doctrine was defense-oriented and lacked an offensive attack capability, which were largely assigned to only three strike formations.[109] In order to upgrade its precision strike capabilities, India is procuring the Sukhoi Su-30MKI advanced combat fighter, Mirage 2000-5, and upgrading the Jaguar and the MiG-27; inducting the KONKURS-M and Nag anti-tank guided weapon systems and the Krasnopol 152/155mm guided artillery weapon into the Indian Army; and utilizing the Rafael litening targeting pod in the IAF. The following sections present these platforms and their capabilities, and their affects on India's precision strike capability.

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[107] V. Phadke, "Response Options: Future of Indian Air Power Vision 2020," *Strategic Analysis*, 24, no. 10 (January 2001), 1.

[108] Singh, 292.

[109] Swami, Praveen. "Gen. Padmanabhan mulls over lessons of Operation Parakram." *The Hindu* February 2004: not available. Database on-line. Available from http://www.thehindu.com/2004/02/06/stories/2004020604461200.htm [22 February 2004].

1. Aircraft

Aircraft are a critical part of the precision strike capability since they provide the means to deliver the PGMs on target and also help by providing laser designation on targets. The IAF signed a U.S. $1.8 billion contract with Russia in 1996 for the Su-30MKI to fill the need for a multi-role fighter with superlative air superiority and ground attack capabilities.[110] The Su-30 is expected to compete with and defeat both the Pakistani Air Force's F-16 and the People's Liberation Army Air Force's J-11, and also deliver precision guided munitions (PGMs) from the air well within the boundaries of both Pakistan and China. Currently, the IAF operates 18 Su-30K and 22 Su-30MKI fighters and has obtained the rights to produce the Su-30MKI indigenously, with 140 Su-30MKIs expected to be produced by 2017.[111] From precision strike perspective, the aircraft is capable of carrying a vast range of weapon systems including PGMs. All compatible Russian Air-to-Air Missiles and Air-to-Ground Missiles for the Su-30MKI are available to the IAF. The aircraft is capable of carrying up to 6 KAB-500KR and KAB-500OD and up to three KAB-1500KR and KAB-1500L guided/smart bombs.[112] The Su-30MKI, with its advanced avionics, precision-guided munitions, and data links capable of uploading valuable targeting data, will provide the IAF with the ability to conduct precise, punitive strikes on enemy targets within Pakistan with little collateral damage. The Su-30MKI will provide the IAF with an opportunity to be able to attain a multi-role fighter capable of engaging the most advanced combat aircraft and engage in ground operations through the application of PGMs.

Mirage-2000 is the other aircraft India is in the process of acquiring to fulfill the duties of delivering PGMs on target. The Indian military is attempting to acquire 12 Mirage 2000-5 fighter aircraft from Qatar at a price of US$37 million per plane. The aircraft, expected to augment India's nuclear weapon delivery system, possesses

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110 Mohammed Ahmedullah, "India Enters Fighter "Big League"," *Military Technology*, 27, 2; Military Module. February 2003, 24.

111 "Russia's Irkut About to Complete Su-30MKI Deliveries to India, Start Production at HAL Enterprises," English compilation of reports from the website of Moscow Voyennykh Novostey, 11 May 2004. Accessed from the Foreign Broadcast Information System (FBIS) portal at https://portal.rccb.osis.gov/ on 9 June 2004.

112 Vayu Sena website located at http://vayu-sena.tripod.com/info-su30mki.html#9, 23 May 2004.

precision strike capability and will further enhance the Indian military's efficiency in delivering munitions on targets. India also is considering a proposal by Dassault for licensed production of 100 Mirage 2000-5s in India.[113]

India is also upgrading its fleet of Jaguar and MiG-27 aircraft to deliver PGMs. The upgrade program is in its first phase where 80 of the aircraft are being upgraded at HAL facilities. The goal of these upgrades is to reach a ratio of 50:50 of 'high-tech' to 'medium to low-tech' aircraft in the IAF. The upgrades include advanced radar, navigation, weapon and electronic systems, and precision-guided munitions. Forty of the approximately 100 Jaguars and 40 of the around 150 MiG-27s in the IAF's inventory are being upgraded. In all, around 140 MiG-27s will be upgraded by February 2008. The first of the upgraded MiG-27s is expected to obtain final operational clearance by October 2005.[114]

2. KONKURS-M, Nag, and the Krasnopol 152/155mm

KONKURS-M is an anti-tank guided weapon system. It is a mobile, high-precision, long-range weapon system with semi-active guidance.[115] It is a tactical system that provides troops on land with an enhanced capability to target enemy tanks with precision weapons.

Nag is a third-generation all weather guided anti-tank missile with fire-and-forget capability and a range of 4,000 meters. It is capable of defeating any known tank with either composite or reactive armors.[116] The last guided flight trial with day and night seeker was conducted on 17 September 2002. The imaging infra-red (IIR) sensor based seeker guidance version of the Nag has given India a hundred percent hit ability, making India only the sixth country in the world to have such technology.[117]

Krasnopol 152/155mm guided artillery weapon is designed to destroy stationary and moving armored and soft targets by the first shot without fire adjustment. The system is capable of firing from multiple weapons against a hard target. The initial part

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[113] Singh, 340.

[114] Ibid, 342.

[115] *Jane's Infantry Weapons*, 1 September 2004, http://www4.janes.com/K2/doc.jsp.

[116] *Jane's Infantry Weapons*, 2 August 2004, http://www4.janes.com/K2/doc.jsp.

[117] Singh, 543.

of the trajectory is normal ballistic trajectory, however, a seeker in the nose of the projectile locks on to a laser illumination from a forward observer designating the target using a laser target designator. The designation range for tanks is 7,000 meters for stationary targets and 5,000 meters for moving targets.[118]

These tactical systems are further examples of the wide range of precision strike weapon systems India is procuring in an effort to improve its precision strike capability to maximize its military's economy of effort. These weapons are expected to significantly improve the quality of India's military and improve the effectiveness and lethality of its military power.

3. Rafael Litening Targeting Pod

The Rafael Litening targeting pod has been a critical piece in India's quest for a capable precision strike capability. The Litening targeting pod was selected by the IAF in 1996 for the Mirage 2000s and the Jaguars.[119] It incorporates in a single pod several targeting features required by a modern strike fighter for precision strike. It includes a FLIR target marker, a TV camera, a flash-lamp powered laser designator, laser spot detection for tracking target designated by other aircraft or from ground, and an electro-optical point and inertial tracker, which enables continuous engagement of the target even when the target is partly obscured by clouds or countermeasures.[120]

The Litening targeting pod is another tactical platform that is part of India's continuing effort to improve its precision strike capabilities. One of the lessons the Indians learned from the first Gulf War was that the quality of an armed force is more important than the number of weapons it possesses. Possessing precision strike capability provides a military the ability to effective target and destroy enemy assets, and deliver a potential lethal blow to the enemy's forces in an efficient manner. India foresees using its precision strike capability to counter the infiltration into Kashmir by using PGMs to launch strikes against terrorist camps. India also wants to use the technological advantage and superiority over Pakistan as a deterrence by ensuring a

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[118] *Jane's Ammunition Handbook*, 10 September 2004, http://www4.janes.com/K2/doc.jsp.

[119] *Jane's All the Worlds Aircraft*, 22 April 2004, http://www4.janes.com/K2/doc.jsp.

[120] *Jane's Electro-Optic Systems*, 6 August 2004, http://www4.janes.com/K2/doc.jsp.

successful and severely damaging counter-strike. The Indians use and success of laser guided bombs during the Kargil crisis has been another reason for India's continuing pursuit of precision strike capabilities. India plans to use its precision strike munitions to 'soften' the enemy by targeting its high-value assets while minimizing risk to friendly forces.

C. MISSILE DEFENSE

Missile defense is an important element of dissuasion in India's policy to dissuade and deter. A combination of Pakistani missile tests and construction of large numbers of tactical ballistic missiles by China have apparently provided the impetus to pursue missile defense technologies.[121] India's goal is to fend off possible missile launches into Indian territory by Pakistan or China through an effective missile defense capability. India also observed the performance of the Patriot missile defense system, which during the Gulf War intercepted eight to nine of the 12 Al-Samoud 2 and Ababil-100 missiles fired at Kuwait. The Patriot missile defense system had only 2-3 minutes to react to some of the missiles fired from near the border.[122] This is further encouragement to India to pursue a missile defense capability that is geared against Pakistan and China, who can reach targets in India in a short amount of time with nuclear missiles. In an effort to attain a missile defense capability, India has pursued the procurement or development of the Barak anti-missile missile system, Greenpine radar system, Arrow anti-missile system, Antey-2500 Anti-Tactical Ballistic Missile (ATBM) launchers, S-300PMU air defense system. These systems, their capabilities, and their contribution to India's goal for a missile defense will be discussed below.

1. Barak Anti-Missile Missile System

As part of its missile defense system India ordered the Barak anti-missile missile system from Israel in November 2000. It is a tactical weapon system designed to intercept sea-skimming missiles, cruise missiles, or air-launched missiles in all weather conditions and during day or night. It has an intercept range from 500 meters to probably

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[121] *Jane's Sentinel Security Assessment – South Asia*, 14 February 2005, http://www4.janes.com/K2/doc.jsp.

[122] Singh, 186.

about 5 kilometers against sea-skimming anti-ship missiles and 12 kilometers against aircraft targets. The Barak anti-missile missile system has been installed on the aircraft carrier INS Viraat, the Godavari class frigates, and may also be fitted on the modified Brahmaputra class frigates.[123] The procurement of the Barak is the first stage in India's desire to acquire a comprehensive theater missile defense system capable of intercepting a variety of missiles, including the ballistic missiles in the future.[124]

2. S-300PMU

The S-300PMU is a version of the SA-10 surface-to-air missile system. It is capable of engaging multiple targets simultaneously, has a capability against low-altitude targets with small radar cross-sections such as cruise missiles, a capability against tactical ballistic missiles, and possibly a potential to intercept some types of strategic ballistic missiles. The S-300PMU has an engagement altitude from 25 meters to about 30000 meters, and has an engagement range of at least 90000 meters. The system employs the CLAM SHELL 3D Doppler radar for target acquisition and the FLAP LID phased-array radar for engagement. The BIG BIRD long-range, 3D surveillance and tracking radar is used with the S-300PMU at the regimental level for initial target detection. The FLAP LID guidance radar provides the system with the capability to engage up to six targets simultaneously, with two missiles assigned per target to ensure a high kill probability. The system can reportedly engage a target with velocity up to 4200km/h. Reportedly in June 1996 27 S-300 missiles were delivered to India.[125]

For the future, India also is interested in licensed production of 25 batteries of S-300 and wants to acquire six S-300 PMU1 low- to high-altitude air defense systems.[126] The S-300PMU1 is an extended range version of S-300PMU with a limited anti-ballistic

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[123] *Jane's Strategic Weapon Systems*, 21 February 2005, http://www4.janes.com/K2/doc.jsp.

[124] Singh, 326.

[125] Federation of American Scientists website, 30 June 2000, http://www.fas.org/nuke/guide/russia/airdef/s-300pmu.htm, (17 February 2005).

[126] Singh, 437.

missile capability, including capabilities against aerodynamic targets with speeds up to 10800km/h.[127] No final decision has been reached on these proposals.

3. Arrow Anti-Missile System and Greenpine Radar System

India has obtained the Green Pine Radar System and is interested in obtaining the Arrow anti-missile system. India has been in talks with Israel for the possible purchase of the Arrow anti-missile system. The Arrow interceptor was designed as part of Israel's efforts to counter missile threats from Iran, Iraq and Syria. The system was built in conjunction with the United States, and any sale of the system by Israel will require the approval of the United States.[128] The Arrow-2 weapon system is built around the Green Pine Radar System which is capable of tracking up to 14 tactical ballistic missiles from a range of over 300km. And according to *Jane's*, the Green Pine Radar has the ability to track and illuminate targets traveling at velocities in excess of 7,000mph and to guide the Arrow anti-tactical ballistic missile missile (ATBMM) to within 4 meters of a specified target.

India acquired a Green Pine Radar system in 2001 for the purpose of developing an indigenous anti-missile defense capability, since there is still no certainty of whether India will be allowed to purchase the Arrow anti-missile system. The near-future plans are to integrate the 25km range Akash missile and phased array Rajendra radar (when they are ready, since currently both are in developmental stages) with the Green Pine.[129] The Akash SAM, with theater missile defense (TDM) potential, is part of the Integrated Guided Missile Development Program inaugurated by Prime Minister Indira Gandhi in 1983.[130]

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[127] Federation of American Scientists website, 30 June 2000, http://www.fas.org/nuke/guide/russia/airdef/s-300pmu.htm, (17 February 2005).

[128] *Jane's Sentinel Security Assessment – South Asia*, 14 February 2005, http://www4.janes.com/K2/doc.jsp.

[129] Singh, 416.

[130] Basrur, R., "Missile Defense and South Asia: An Indian Perspective," in The Impact of US Ballistic Missile Defenses on Southern Asia, Michael Krepon and Chris Gagne, eds. (Washington, D.C.: The Henry L. Stimson Center, DATE), 14, http://www.stimson.org/southasia/pdf/SABMDBasrur.pdf

4. Antey-2500

In 2001 India became the first customer for the Russian Antey-2500 ATBM system. India will purchase six fire units from Russia and produce additional 19 units under license. The program, including the necessary steps to integrate the Antey-2500 system into India's overall air defenses, is expected to cost approximately U.S. $7 billion over 15 years.[131] India also plans to supplement the Phalcon and Green Pine radar systems with approximately 150 Russian Antey 2500 anti-ballistic missile launchers at some point in the future, as it begins to integrate its missile defense assets.[132]

India and Israel also are cooperating in the future development of ballistic missile defense systems with boost phase intercept capability and India is seeking Israel's help in developing an anti-missile system based on the Israeli Arrow-2 that would be tailored to Indian requirements.[133]

The radars mentioned above, the Barak, the S-300, and the possible acquisition of the Arrow in the future are expected to play a central role in the future comprehensive theater missile defense capability for India. India has been under a nuclear threat from China for decades and from Pakistan since 1998, and a future theater missile defense is critical to India for its goal to dissuade Pakistan and China from launching a missile attack. And since Pakistan upholds the policy of first use of nuclear weapons, it is especially important to India to be able to dissuade Pakistan from launching a missile attack against India by obtaining the capability to neutralize a potential missile attack by Pakistan. India's primary defense against an attack is deterrence through its pursuit of superior military capability, but India wants to pursue missile defense capability to provide security and dissuade a potential attacker in case its deterrence fails. However, India's current and future missile defense platforms range from Indian, Soviet, Israeli, and Western built technologies produced over several decades. And as India moves forward with its missile defense capabilities, it is expected to encounter difficulties in

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131 *Jane's Sentinel Security Assessment – South Asia*, 14 February 2005, http://www4.janes.com/K2/doc.jsp.

132 Singh, 416.

133 Singh, 413, 418.

integrating its vast array of different systems into its Command, Control, Communication, and Integration (C4I).[134]

D. CONCLUSION

The modernization efforts by the Indian military through the continuing development, upgrade and acquisition of platforms such as the Phalcon AWACS, surveillance and weapon locating radars, maritime surveillance aircraft, UAVs, satellites, the Su-30MKI, the Mirgae 2000-5, the Jaguar, the MiG-27, anti-tank guided and guided artillery weapons, the Rafael litening targeting pod, the Barak anti-missile missile and the Arrow anti-missile systems, the Greenpine radar system, the Antey 2500 ABM launchers, and the S-300 PMU air defense system 0---are helping India achieve a military edge over the country it has been to war with on three different occasions, Pakistan. At the same time, the modernization is also helping bridge a quality gap between the Chinese military and the Indian military. The motivations behind these efforts by the Indian military have been to neutralize a potential threat from Pakistan and to have even-standing against the Chinese military in a potential conflict in the Himalayas. Another factor behind India's drive for military modernization has been the success of the U.S. military during the Persian Gulf War due to its highly effective ISR, precision strike, and missile defense capabilities. India wants to improve its ISR and precision strike capabilities, through the use of laser-guided and GPS systems, to improve its effects-based bombing, which allows for maximum physical damage with reduced civilian casualties and collateral damage.[135]

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[134] *Jane's Sentinel Security Assessment – South Asia*, 14 February 2005, http://www4.janes.com/K2/doc.jsp.

[135] Singh, 184.

IV. PAKISTAN'S REACTIONS

The previous chapters outline India's recent efforts to upgrade its intelligence, surveillance, and reconnaissance (ISR), precision strike, and missile defense capabilities through indigenous development and foreign procurement. These efforts have been motivated by lessons India learned during wars with both Pakistan and China. However, given that Pakistan has a more extensive history of wars with India, and the two countries have been at a relatively high state of tensions with each other throughout their existence, Pakistan is likely to view India's recent efforts as a threat to its security, which may result in increased instability in the region. This chapter presents the advantages India's military modernization confers upon it, along with Pakistan's perception of these efforts, its likely reactions, and the overall effect this may have on the stability of the region

First, India's military advantage over Pakistan is discussed, with specific regard to ISR, precision strike and missile defense capabilities. Within ISR, India's procurement of the Phalcon airborne early warning and control system (AWACS) and its space program development are presented. For precision strike, India's procurement of the Su-30, the Mirage 2000, and the MiG-29 are discussed. Finally, India's pursuit and development of its missile defense capability and the subsequent repercussions for Pakistan also are evaluated.

A. REGIONAL RIVALRY

The current conflict between India and Pakistan is rooted in the historical and well-documented tensions between the region's Hindu and Muslim factions. The antecedents of the conflict began well before India's independence and the creation of Pakistan in 1947. Even during British rule of India, Muhammad Ali Jinnah and the Muslim League expressed concern about the majority Hindu population in India. Jinnah claimed that once the British left India, the Congress-led government would heavily favor the Hindu majority, to the detriment of the Muslim minority. He believed that Hindu and Muslim populations could not live harmoniously together, and should be divided into two

separate nations.[136] This belief culminated in the creation of Pakistan in 1947, and as a self proclaiming prophecy resulted in a war between Pakistan and India over Kashmir shortly after independence. In total, the two countries have fought three wars against each other, as well as several skirmishes and incidents which risked escalation to full-out wars.

India went through an increase in military spending and equipment procurement in the 1960s and the 1980s. Following the war with China in 1962, India recognized the need for a more robust military than it possessed at that time; and the procurement in the 1980s was generally due to the necessity to replace the equipment that was bought in the 1960s. This was followed by a period of stagnation in the 1990s due to the fact that India experienced a major financial crisis in the early years of the 1990s, when India's central government adapted economic reform policies.[137] However, since the late 1990s, Indian military has returned to the policy of procuring and upgrading its equipment primarily due to the potential threat from China and Pakistan, from the lessons learned by the Indian military from their experience during the Kargil crisis, and from observing the success of the U.S. military during the Gulf War. India's increase in military spending is a direct, justifiable concern for Pakistan: nine of the 12 Indian Army Corps are deployed along the Line of Control (LOC) or against Pakistan, and over two-thirds of the India Air Force bases are concentrated in positions near Pakistan.[138]

As discussed in Chapter III, India's efforts to modernize and procure high-tech equipment seek to achieve the following goals: 1) to prepare itself for possible conflicts against China and/or Pakistan and; 2) to better consolidate its power in Kashmir. In addition, India aspires to play an active and influential role in global affairs and does not want to be treated as a client state by the major powers, especially at a bilateral level.[139]

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[136] Christophe Jaffrelot, *A History of Pakistan And Its Origins* (London: Wimbledon Publishing, 2002), 12.

[137] Jeffrey D Sachs, Ashutosh Varshney and Nirupam Bajpai, eds. *India in the Era of Economic Reforms* (Oxford University Press, 2000), 261.

[138] Zawar Abidi. "Threat Reduction in South Asia." date unknown, www.stimson.org/southasia/pubs.cfm?ID=87 (17 February 2005), 3.

[139] Interview with Brig. Gurmeet Kanwal (Retd.), Observer Research Foundation, New Delhi, February 2005.

To achieve these goals, India has been upgrading its ISR, precision strike, and missile defense capabilities. Chapter three elucidated India's efforts to modernize and upgrade its Air Force's ISR and precision strike capabilities, space program, and missile defense program through indigenous development and foreign procurement. This modernization effort is not only responsible for a tangible increase in India's military options, it is also causing a growing disparity between Indian and Pakistani conventional military capabilities. This situation is further complicated by both countries' acquisitions of nuclear weapons in 1998. Because Pakistan cannot match India's conventional military capability, the result of this growing divergence will be either a regional arms race and/or a decreased nuclear threshold for Pakistan.

B. MILITARY DISPARITY

Indian military possesses a considerable advantage over the Pakistani military in both number of personnel and quality of equipment. The Indian Army and Navy both exhibit approximately two times as much manpower as those of Pakistan, and the Indian Air Force has over three times the personnel as the Pakistani Air Force.[140] The Indian Army also possesses better tanks as well as more advanced armored infantry fighting vehicles and superior artillery. The Indian Army has a sizable inventory of T-72 and T-90 tanks, compared to Pakistan's relative small component of T-80UD and a few Al-Khalid tanks. Both the Indian Navy and Air Force possess significant inventory advantages over Pakistan, with approximately six times more equipment both services. Pakistan's front line aircraft, the F-16, which is hampered by a lack of spare parts, would be unlikely to match India's most advanced combat aircraft like the Su-30MK, Su-30MKI, Mirage 2000, Jaguar, MiG-27 and MiG-29.[141] Finally, has a distinct advantage over Pakistan due to its recent acquisition of the Phalcon AWACS.

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[140] International Institute of Strategic Studies, *The Military Balance for 2002-2003* (London: IISS, 2003), 129-34.

[141] Abidi, Threat Reduction, 2, 4.

C. ISR

As discussed in Chapter III, in October 2003 India signed a trilateral deal with Russia and Israel, which enabled it to acquire the sophisticated Phalcon AWACS. The Phalcon system possesses electronic support measures (ESM), electronics intelligence (ELINT), communications intelligence (COMINT), communications support and datalink management suites.[142] The Israeli radar will be mounted on a Russian IL-76TD aircraft, and when India acquires the system, it will become the only country in the region to possess three AWACS. With a phased-array radar system that provides surveillance, detection, and tracking to a radius of 370-400 km, India will have a clear operational edge over Pakistan and China.

Pakistan's initial reaction to India's AWACS system will to be attempt to procure its own airborne early warning (AEW) system. However, there is another option Pakistan could pursue, given that seeing further, deeper and in greater detail into an enemy's territory does not necessarily confer an advantage. It can, in fact, lead to greater chances of misunderstanding. Pakistan's Air Commodore (Retd.) Shahid Kamal Khan promotes the idea of capitalizing on this potential misunderstanding by developing and deploying a substantial arsenal of drones, decoy, spurious track generators, electronic emitters that duplicate radar signatures of strike aircraft - false targets and false alarms which will generate real engagements and real responses from the Indians. He proposes employing cheap and plentiful triggers that will elicit expensive and complex solutions by the Indians. The idea is that the Indians will respond to all the indicators they can now see due to their advanced AWACS technology, which will overwhelm their early warning systems and defenses. This will lead the Indians to deplete their inventory and their will.[143] This, however, is a dangerous and risky undertaking for two nations with nuclear capabilities. Misunderstandings and over-reactions by one or both sides could potentially lead to disastrous consequences.

India's space program is also a security concern for Pakistan. The Indian Space Research Organization (ISRO) has developed the Polar Satellite Launch Vehicles (PSLV)

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[142] *Jane's Electronic Mission Aircraft 02*, http://www4.janes.com/K2/doc.jsp, 17 February 2005.

[143] Air Commodore (Retd) Shahid Kamal Khan. "Early Warning - The Phalcon "Phallacy", (August 2004), http://www.pakdef.info/forum/showthread.php?t=4992 (14 March 2005).

and the Geosynchronous Satellite Launch Vehicles (GSLV) to launch satellites into space. ISRO has been responsible for developing and launching several communication satellites, as well as the Technology Experiment Satellite (TES). The TES reportedly carries a one meter high-resolution imaging camera, capable of sensitive defense surveillance applications, which would enable India to detect and identify significant military targets.[144]

India also has signed various agreements with Israel to cooperate in space research. In the near future, India will be using satellites for military communications, surveillance, navigation and also for early warning. According to the Chief of Indian Air Staff, S. Krishnaswamy: "work had begun to have [laser] weapon platforms in space".[145] The model is inspired, in part, by the U.S. use of space-based assets to guide long-range precision firepower in the recent offensive against al-Qaida in Afghanistan. In addition, the Indian Air Force's relatively successful employment of laser-guided bombs during the Kargil crisis is a further encouragement for the space-based weapons program.[146]

In order to achieve similar retaliatory means, Pakistan may choose to engage India in a "space arms-race." Alternatively, Pakistan may also engage in ever increasing production and deployment of missiles – on aircraft, in hardened silos, or road-mobile vehicles – in order to ensure that an offensive force would be able to survive a pre-emptive Indian attack.

However, India's increasing capability to target Pakistan's strategic assets from space will leave Pakistan with virtually no recourse other than nuclear retaliation. Pakistan is aware that it cannot risk having its strategic targets destroyed by India's superior conventional and space resources. Currently, there is an "ugly stability" that prevails between Indian and Pakistani conventional forces. A relative military parity forces India to respect Pakistan's military capability to inflict reciprocal damage, which discourages India from launching an attack against Pakistan without unacceptable losses.

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144 M.V.Ramana, R. Rajaraman, and Z. Mian, "Nuclear Early Warning in South Asia," *Economic and Political Weekly* 17 January 2004, accessed on the internet on 17 February 2005.

145 Staff Correspondent. "IAF Working on Weapon Platforms in Space." *The Hindu* 07 October 2003, accessed on the internet at www.thehindu.com/2003/10/07/stories/2003100703041200.htm

146 Vinod Anand, "Future Battlespace and Need for Jointmanship," *Strategic Analysis* 23, no. 10 (January 2000), 1.

This has led to a sense of security for Pakistan. However, if India achieves a real military advantage over Pakistan, that is to say that India could achieve significant strategic goals through military operations against Pakistan with minimal losses to its own forces, this sense of security for Pakistan may vanish and force Pakistan to lower its nuclear threshold in order to discourage India from launching an attack against Pakistan's strategic assets. Therefore, an increased Indian military capability is likely to lead Pakistan to lower its nuclear threshold and place greater emphasis on its nuclear arsenal.

D. PRECISION STRIKE

The Indian Air Force, considered to be a modern, technology-intensive service, has evolved into the fourth largest air force in the world. Its recent acquisitions, specifically the Su-30 and the Hawk trainers, have provided the Indian Air Force (IAF) with a present generation air defense fleet and are helping improve the skill of the IAF pilots. By 2010 or 2015, the IAF aims to become a "lean, mean force" through a combination of acquisitions and upgrading of existing platforms capable of delivering increased firepower with beyond visual range (BVR) missiles and precision-guided munitions.[147]

In recent years, the IAF has shifted from a confined, tactical role that primarily provided ground-force support, to a more strategic and independent role. This has largely been accomplished by the addition of Mirage 2000 and Su-30MKI aircraft, which provide concentrated strike capability deep within enemy territory. The addition of the Su-30MKI essentially gives India air superiority over Pakistan, providing it with both pre-emption and swift retaliation capability, in addition to the deep strike and interdiction capability. The Su-30 MKI will be a valuable asset for India's conventional and strategic strike capability. India received its first shipment of Su-30s in 2002 and in 2004 India's Hindustan Aeronautics Limited (HAL) is scheduled to commence license production of the aircraft.

147 *Janes Sentinel Security Assessment – South Asia*, http://www4.janes.com/subscribe/sentinel/SASS_doc_view.jsp, 16 April 2004.

To further enhance its strategic depth and operational capability, India has acquired mid-air refuellers. This force multiplier will provide the IAF an ability to maintain longer on-station patrols and the ability to reach further inside enemy territory.

Along with the Su-30MKI India also possesses the MiG-29s. Both of these aircraft are capable of carrying the AA-12 Adder missiles, which have BVR capability, and will give India a significant tactical advantage over the Pakistani Air Force. The AA-12 Adder is a medium-range, radar-guided, air-to-air missile with a range of approximately 75 km. The Adder has been compared to the American AIM-120 AMRAAM due to its similarities in appearance and likely performance.

According to fighter analyst Benjamin Lambeth, as quoted in *Jane's* "Whoever has the longest reach controls the engagement."[148] Combined with its range, the missile's inertial, command, and active radar guidance systems essentially defines the depth of the air battle. The BVR advantage will allow the IAF pilots to maneuver without fear of engagement against the Pakistani Air Force pilots – a tactical advantage in an air-to-air engagement against which the Pakistani Air Force currently does not have a response.

India's increased deep strike and BVR capability, combined with Pakistan's lack of defensive depth puts all of Pakistan's aircraft and airfields within range of Indian air attack. Additionally, India's recent acquisition of low-key U.S. smart-bomb technology makes Pakistani air bases particularly vulnerable.[149]

In one possible outcome, the situation becomes a precursor for an arms race, which may escalate out-of-control. In an effort to establish parity, Pakistan may be forced to procure similar BVR technology. India, in turn, may attempt to regain the advantage by purchasing or developing longer range missiles.

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[148] Bill Sweetman, "Fighter Tactics", *Janes International Defence Review – June 01*, 2001, on Janes website, www4.janes.com/K2/doc.jsp

[149] IISS, *The Military Balance for 2002-2003*, 137.

In another outcome, Pakistan may be forced to rely more heavily on its nuclear arsenal. Given its limitations and India's ability to disable Pakistani aircraft on the air fields, Pakistan is likely to increase its nuclear deterrent to high alert since it must now fear the possibility of successful Indian preemptive air attacks.[150]

E. MISSILE DEFENSE

According to Indian defense analyst C. Raja Mohan, President Bush has made a political alliance that favors strategic partnership with India. This partnership will lead to an enhanced flow of advanced technologies from the United States to India. At the core of this issue is the 'quartet of issues' – peaceful uses of nuclear energy, civilian space program, liberalization of the transfer of dual use technologies, and missile defense. India is interested in acquiring weapons systems from the United States along with a broad range of defense technologies. As India and the United States move closer to signing a high technology pact, India is potentially going to gain U.S. know-how in several fields, including defense, space, and missile defense technologies. The U.S. officials have acknowledged India's missile defense program, stating, "[w]e are aware that India's missile defence ambition is part of its no-first-use policy".[151]

An improved U.S. and Indian relationship, which includes transfer of technologies, is a great security concern for Pakistan. Assistance from the United States will lead to increased Indian military capability, which in turn will result in greater potential threat to Pakistan via the Indian military. This will most likely force Pakistan to pursue relationships and alliances with other nations in an effort to procure more advanced military equipment and retaliatory measures.

Having developed its own range of ballistic missiles, India has recently begun to seek a missile defense system that will neutralize, or at least minimize, the Pakistani nuclear threat. India's defense research and development organization (DRDO) has pursued foreign collaboration with Israel and Russia to provide India with its first anti-

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[150] IISS, *The Military Balance for 2002-2003*, 137.

[151] Indrani Bagchi, "Diplomacy: Indo-US Relations High on Tech," *India Today on the net,* 19 November 2003.

tactical ballistic missile (ATBM) system.[152] In order to develop an ATBM system, the DRDO has tried to procure the Russian S-300 SAM ATBM system, which is similar to the U.S. Patriot system, and as of October 2003 was negotiating to procure the Israeli Arrow anti-missile system, which is developed by Israel in cooperation with the United States.

India's efforts to acquire integrated air defense and ATBM systems are likely to lead to a "missile arms race" in South Asia. A sophisticated air defense system with anti-missile capabilities would potentially offset Pakistan's reliance on its ballistic missiles and tactical strike aircraft, like the F-16 and Mirage III, as the primary nuclear capable delivery systems. India's continued ATBM improvements could erode Pakistan's confidence in its current nuclear deterrent. To compensate, Pakistan may adopt a nuclear launch-on-warning posture, and begin to vastly increase its nuclear arsenal and delivery systems, in an attempt to saturate India's air defenses.[153]

F. CONCLUSIONS

India's military modernization efforts are providing it with distinct advantages over Pakistan, and widening the gap between the two countries' military abilities. An increased ISR capability enables it to successfully locate targets inside Pakistan, including its nuclear arsenal. An improving precision strike arsenal provides India with the ability to launch an attack – either pre-emptive or retaliatory – against targets inside Pakistan with a high degree of success. And obtaining a missile defense will provide India with the capability to defend itself against potential nuclear strikes from Pakistan. From Pakistan's perspective, India can locate Pakistan's nuclear weapons with its improved ISR capability, launch a preemptive strike to target Pakistan's nuclear arsenal with a high degree of success with its precision strike weapons, and defend itself with its missile defense capability against a retaliatory nuclear strike that Pakistan may be able to launch with nuclear weapons that India may have missed on its initial strike. As a security concern for Pakistan, this may be a scenario that India may be willing to pursue.

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[152] Guarav Kampani, "Stakeholders in the Indian Strategic Missile Program," *The Nonproliferation Review*, 10, no. 3 (Fall-Winter 2003), 58.

[153] IISS, *The Military Balance for 2002-2003*, 117.

A possible avenue for Pakistan to pursue under this scenario would be to increase its nuclear arsenal in order to survive an attack on its nuclear weapons and still maintain enough weapons to saturate India's missile defense.

The Indian Armed Forces' superiority in strength and technological capabilities pose a serious threat to Pakistan's security as well. In light of India's growing conventional military superiority, Pakistan, in an effort to achieve a strategic balance, launched its nuclear program to establish a deterrent against India and to compensate for India's conventional military advantages.[154]

After India conducted a series of nuclear tests in May of 1998, Pakistan followed suit by conducting its own nuclear tests. Pakistan's 1998 nuclear weapon tests likely were seen by Islamabad as a necessary response to India's nuclear tests, and as a means of bolstering its own deterrent. Pakistan is driven by its perceived need to counter India's conventional superiority and nuclear capability and remains fearful of India's regional and global power aspirations. This has led Pakistan to pursue and maintain close security ties with China as a balance.[155]

By rejecting the "no first use" policy, Pakistan implicitly advocates nuclear threat as a viable deterrent. Pakistan's objective in rejecting the "no first use" policy is to deter India from launching a conventional war, because Pakistan recognizes its disadvantage in the conventional warfare arena. This view was expressed by Pakistani President Pervez Musharraf, as quoted in Abidi's article *Threat Reduction in South Asia*: "[n]o sane person in normal conditions can ever even contemplate going into a non-conventional war, but basically the best guarantee is to avoid conflict."[156] To this end, Abidi quotes President Musharraf as having stated, "the conventional balance is South Asia is extremely important to maintain peace in the region."[157]

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[154] Abidi, "Threat Reduction," 4.

[155] Anthony Cordesman, "Weapons of Mass Destruction in South Asia, India and Pakistan: A Quantitative and Arms Control Analysis," (February 2001), Center for Strategic and International Studies, 14, http://www.csis.org/burke/mb/asia_sa_wmdsouthasia.pdf (17 February 2005).

[156] Abidi, "Threat Reduction," 6.

[157] Ibid, 6.

However, the conventional military capabilities gap between India and Pakistan is likely to continue to grow due to India's growing purchasing power and its efforts to continue procurement for the foreseeable future. And as India's conventional military capabilities increase compared to Pakistan's, it will allow India to conduct successful preemptive strikes against Pakistan. For example, as India's ISR and precision strike capabilities increase, they will provide India with the ability to conduct suppression of enemy air defenses (SEAD) operations, followed up with bombing attacks escorted by fighter aircraft and supported by AWACS, against Pakistan's high value assets (HVAs). This improved ISR capability through the application of AWACS will allow a quick response engagement by Indian fighter aircraft to Pakistan's response to Indian intrusion. Once Pakistan's air defenses, ground and air based, have been neutralized, Indian bombers will be able to conduct unhindered and effective bombing operations against Pakistan's strategic targets with precision guided bombs, which will ensure high probability of destruction.

Given the current gap between the two countries' conventional military capabilities, as well as India's current trend of procurement and upgrading programs, it is unlikely Pakistan will be able to maintain sufficient conventional deterrent to prevent India from orchestrating a successful pre-emptive strike against Pakistan.

In summary, the net effect of significant Indian development and procurement programs has been to drastically alter the military balance in India's favor.[158] If India continues to modernize and upgrade its ISR, precision strike, and missile defense capabilities, maintains a significant conventional advantage over Pakistan, and persists with acquisition at the current pace, Pakistan will have to either enter into an arms race to increase its conventional military capabilities, or continue to rely on its nuclear weapons, with the option to initiate a nuclear strike as the main deterrent against an Indian aggression. In such a climate, a regional arms race may eventually lead to a "hair-trigger" posture toward the nuclear arsenal. Rather than provide security to India,

[158] Abidi, "Threat Reduction," 10.

achieving a significantly superior conventional military force over Pakistan may, paradoxically, cause greater instability in the region, and, in a worst case scenario outcome, lead to nuclear war.

V. EFFECTS ON THE STABILITY IN SOUTH ASIA

India's concerted effort to upgrade its intelligence, surveillance, and reconnaissance (ISR), precision strike, and missile defense capabilities is a direct result of regional power competition with China and Pakistan. Pakistan is particularly likely to view these efforts as threatening, and may be compelled to take actions that will lead to greater insecurity in the region. This chapter summarizes the arguments presented in previous chapters, which evaluate India's modernization and Pakistan's possible reactions, and also presents an explanation, based on the realism argument, for the continuing hostilities between India and Pakistan. According to this argument the persistent tensions between India and Pakistan are predominantly because of Pakistan's sense of insecurity due to the imbalance of power between the two states.

India views China as both an economic competitor and as a rival for regional power. The Indian government believes that as China's economic capabilities grow, so do its superpower aspirations, which could cause a major shift in the region's power balance and threaten India's national security.[159] To prevent a future confrontation with China, India has entered a period of military modernization; it plans to use its increasingly capable military as a diplomatic tool, encouraging China to pursue bilateral talks while avoiding military confrontation. Hence, India views its military modernization as an avenue to negotiations against what it perceives as its primary long-term future adversary.

Pakistan, however, is a slightly different case. India and Pakistan have a long, extensive history of conflicts, and there have been tensions between the two countries since their inception in 1947. Pakistan believes that India has aspirations to militarily "re-unite" the two countries, and cites the positioning of nine of the 12 Indian Army

[159] R.V. Phadke, "Response Options: Future of Indian Air Power Vision 2020," *Strategic Analysis* 24, no. 10 (January 2001), 4.

Corps along the Line of Control (LOC) or against Pakistan, and the concentration of over two-thirds of the Indian Air Force bases near Pakistan as examples of India's aggressive intent.[160]

In contrast, Indians perceive Pakistan as an unstable country that has been through several military coups and government overthrows and views Pakistan's military dominated government to be spending a disproportionately high amount of money on its military. Having an undemocratic neighbor with the military at the helm will continue to be a concern for India.[161]

To prevent future wars with either China or Pakistan, Indians believe they need to possess the military capability to be able to dissuade and deter their potential adversaries. In order to accomplish this, India has undertaken efforts to modernize its ISR, precision strike, and missile defense capabilities through both indigenous development and acquisitions of foreign weapons systems. To improve its ISR capabilities, India is focusing on the Phalcon Airborne Warning and Control System (AWACS), surveillance radars, weapon locating radars, maritime surveillance aircraft, Unmanned Aerial Vehicles (UAVs), and satellites. For precision strike, India's efforts are geared towards acquiring the Su-30MKI, Mirage 2000-5, upgrading the Jaguar and the MiG-27, acquiring and developing anti-tank guided weapon systems, guided artillery weapons, multi-purpose guided weapons, and the Rafael litening targeting pod. To develop an anti-missile defense capability, India is focusing on the Barak anti-missile missile system, Greenpine anti-missile system, Antey 2500 anti-ballistic missile launchers, and the S-300 PMU air defense system. These systems are expected to provide India with the ability to dissuade and deter its potential attackers by achieving a military edge over Pakistan and by helping bridge a quality gap between China. The modern technology is expected to improve India's capabilities to survey the potential threats to its security and respond to them in a timely, effective, and efficient manner. Additionally, India's future missile defense capability is expected to protect against potential nuclear attacks.

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[160] Zawar Abidi. "Threat Reduction in South Asia," date unknown, 3, www.stimson.org/southasia/pubs.cfm?ID=87 (17 February 2005).

[161] Interview with Brig. Gurmeet Kanwal (Retd.), Observer Research Foundation, New Delhi, 7 February 2005.

India's increased military spending has been a direct concern for Pakistan, and it is likely to view India's recent modernization efforts as a threat to its security. India's military modernization program has led to a growing disparity between the Indian and Pakistani conventional military capabilities, shifting the balance of power toward India. If India pursues its policy to achieve technical superiority in ISR, precision targeting and missile defense, it will be able to effectively locate and efficiently destroy strategically important targets in Pakistan and congruently defend against an incoming strike from Pakistan. However, as the military disparity between the two countries increases and India gains greater capability to launch a successful preventive strike against Pakistan, Pakistan is likely to engage India in a low-level conflict as predicted by the strategic stability/tactical instability paradox. The result of this growing divergence in the two countries' conventional capabilities will be either a regional arms race and/or a lowering of the nuclear threshold for Pakistan, and greater instability in the region. Instead of providing greater security, at least in the near-term, India's continuing improvement and modernization of its ISR, precision strike, and missile defense capabilities is likely to lead to greater instability in the region. Hence, India's efforts to increase its security will ironically lead to a greater threat to its security.

It is also important to recognize that India's growing military needs are not just threat oriented. For over ten years, India has had one of the fastest growing economies in the world. This economic growth has brought concomitant issues: increased trade means increased vulnerabilities that need to be protected, such as energy sources and commerce routes. The increase in GDP also has led to an increase in the overall defense budget (even though as a percent of GDP the defense budget has stayed consistently below 3 percent, with the 2003-2004 budget at 2.4 percent of GDP).[162] India also has aspirations to play a more dominant role in world affairs; establishing greater influence in its own

[162] *Jane's Sentinel Security Assessment – South Asia*, "Defence Spending" on website www4.janes.com/K2/doc.jsp, accessed on 20 February 2005.

region is a first step in attaining higher status and influence on a larger scale. For all these reasons, Indians believe they must have a military commensurate with the size and economy of the country.[163]

A. BANDWAGON OR BALANCE?

Pakistan essentially has two options, either bandwagon with India (as some of the other smaller neighbors of India have done) or balance against India. Among Indian policy makers, there is a school of thought that believes Pakistan has no other option than to bandwagon with India.[164] The reality is that India has the industrial base and purchasing power to develop and procure sophisticated military equipment; Pakistan cannot keep pace with India's growing economy, and therefore cannot match its military spending. The consequences of another conflict between India and Pakistan are serious: "if Pakistan misinterprets India's actions and takes military actions against India, then Pakistan will have to deal with the consequences of India's response."[165] A Pakistan that chooses to bandwagon may be a possibility in the long-term, however, over the next ten to 20 years as Pakistan is threatened by India's growth (economic and military) its response is likely to produce destabilizing affects. An alliance between the two countries remains, at the moment, a distant possibility.

For now Pakistan has chosen to balance against India, since it is a relatively stronger state than some of the other neighbors of India. This is in line with the Realist argument that when possible, a state is expected to balance rather than bandwagon, since it is assumed that states want to maintain their autonomy: "[S]tates facing an external threat overwhelmingly prefer to balance against the threat rather than bandwagon with it. This is primarily because an alignment that preserves most of a state's freedom of action is preferable to accepting subordination under a potential hegemon."[166]

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[163] Interview with Brig. Gurmeet Kanwal (Retd.), Observer Research Foundation, New Delhi, 7 February 2005.

[164] Interview with Brig. Sahgal, United Service Institution of India, New Delhi, on 10 February 2005.

[165] Ibid.

[166] Stephen Walt, "Alliance Formation and the Balance of World Power," *International Security*, 9, no. 4 (Spring 1985), 15.

Pakistan has attempted to balance against India through internal capabilities and through external help from other states (mainly China and the United States).[167] Pakistan's internal efforts, based on GNP and defense budgets that are far inferior to India's, cannot sufficiently achieve balance, and it will continue to seek external aide in the form of military assistance.

The situation has a long precedent in Pakistan; as Prime Minister Bogra said in 1954, regarding an alliance with the United States: "[a]t present, we can't get a settlement, mainly because India has greater military strength…When there is more equality of military strength, then I am sure that there will be greater chance of settlement."[168] Pakistan pursued an alliance with the United States even though talks between Nehru and Ali were heading towards resolutions of disputes, including Kashmir. Nehru had warned Ali against any such alliance and withdrew from the talks following the announcement of a defense treaty between the United States and Pakistan. This shows that Pakistan is motivated by the need to balance against India. While the resolution of disputes was important to Pakistan, resolution alone would not have removed the imbalance of power between the two countries: "Because Pakistan's insecurity was tied to the power imbalance in South Asia rather than to specific disputes with India, Pakistan saw greater security in a defence treaty with the US, even if the pursuit of such a treaty put at risk its the negotiations with India over Kashmir."[169]

India saw its concessions towards Pakistan during the settlements following the 1965 and 1971 wars, at Tashkent and Simla, as generous. However, Pakistan failed to live up to them primarily because neither of these agreements solved the fundamental issue of the overwhelming imbalance of power between the two countries. Pakistan, in fact, emphasized the importance of balancing India in the post-war period. Following the Tashkent agreement, Pakistan attempted to build its relations with the Soviet Union in an attempt to wean it away from India; and after the 1971 war, Pakistan began its atomic weapons program. Both of these efforts by Pakistan were aimed at correcting the

[167] R. Rajagopalan, "Neorealist Theory and the India-Pakistan Conflict–II," *Strategic Analysis*, 22, no. 10 (January 1999), 2.

[168] Ibid, 4.

[169] Ibid, 6.

imbalance between the two countries.[170] Irrespective of how well negotiations may be going between the two countries over a dispute or how conciliatory India may have been towards Pakistan, Pakistan has always opted for the option to try and balance against India.

B. FOR THE POLICYMAKERS

The India–Pakistan conflict can be seen as a direct consequence to the imbalance of power between the two states and Pakistan's perception of the threat due to this imbalance. Hence, the more India obtains sophisticated military equipment and the greater the gap widens, the more threatened Pakistan will become and the more actions it will take in order to increase its security. "The persistence of the conflict is a consequence of the persistence of this imbalance and of Pakistan's attempts to correct it."[171] And this will lead to greater instability in the region.

The Indian Armed Forces' superiority has driven Pakistan to explore options to strategically balance India. This led Pakistan to pursue a nuclear weapons program: "Pakistan launched its nuclear program to establish a deterrent against India and to compensate for India's conventional military advantages".[172] This is one example of a drastic measure that Pakistan has employed to maintain parity with India and to bolster its own deterrent.

Pakistan remains fearful of India's regional and global power aspirations and has maintained close security ties with China in an effort to balance India's conventional superiority and nuclear capability. Pakistan has procured several weapon systems from China and will likely continue to do so as long as the Indian military retains its current advantage. If India continues its build-up and upgrading of its military equipment, Pakistan will have to either enter into an arms race and increase its conventional military capabilities or continue to rely on its nuclear weapons as a deterrent strategy. Rather than provide security for India, achieving a significantly superior conventional military force

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[170] Rajagopalan, "Neorealist Theory–II," 7.

[171] Ibid, 1.

[172] Abidi, Threat Reduction, 4.

over Pakistan may, paradoxically, lead to an escalating arms race, regional destabilization, and potentially even a nuclear war.

In order to successfully engage India and Pakistan, United States policymakers must understand the effects that India's military modernization may have in the region. The goal for the U.S. government should be to decrease the conventional military imbalance between India and Pakistan in order to minimize Pakistan's perceived threat. This would promote stability by raising the nuclear threshold for Pakistan.

Effective U.S. policy should be derived from a strong understanding of the historical tensions between the two countries. After nearly sixty years of the India-Pakistan conflict, its most salient characteristic is its persistence. Resolutions of specific disputes have frequently given way to renewed disputes; for example, both the Indus river dispute and the conflict over the Rann of Kutch were resolved in the 1960s, yet neither resolution had a lasting impact on India-Pakistan relations. During the past decades, the tension between the two nations has taken various forms, including disputes over the rivers, fishing rights, Bangladesh, the Siachen Glacier, and Kashmir, to name just a few. The multiplicity of disagreements suggests that the disputes themselves are only symptoms of a deeper conflict between the two countries.[173]

In their dealings with India and Pakistan, U.S. policymakers should understand that the main cause of the India-Pakistan conflict is the imbalance of power between the two countries, and Pakistan's resulting insecurity due to this imbalance. As long as Pakistan is attempting to correct this imbalance, the conflict will continue.[174]

Basic demographic information reveals the extent of the imbalance in population, economic, and military terms. India's population is over six times than that of Pakistan, its economy is more than six times larger, and its defense budget is several times larger, which coupled with a higher GNP, allow India to meet its defense burden with greater ease. India's military force is twice the size of Pakistan's and is also qualitatively

[173] R. Rajagopalan, "Neorealist Theory and the India-Pakistan Conflict–I," *Strategic Analysis*, 22, No. 9 (December 1998), 1.

[174] Rajagopalan, "Neorealist Theory–II," 1.

superior. The imbalance of power is overwhelmingly in favor of India, which has driven Pakistan to undertake frantic balancing efforts.[175]

Because the United States has a vested economic, military and political interest in South Asian stability, it should seek to promote a balance of power between India and Pakistan. This is especially complicated since the United States wants to bolster India's technology capabilities as a long-term balance against China's growing capabilities, and since it is unrealistic to presume that the United States can prevent India from procuring or developing advanced military equipment, due to India's growing purchasing power and industrial base. Therefore, in order to prevent a near-term India-Pakistan conflict, the United States should support the procurement of military hardware for Pakistan, which would allow it to keep pace with India's qualitative capabilities. Sharing space technology with India is a long-term perspective, which do not pose an immediate threat to Pakistan, and should be continued. However, assets such as fighter aircraft and AWACS are an immediate concern to Pakistan, and the United States should attempt to maintain parity of such assets between the two countries. Since India has obtained the Su-30 aircraft from Russia, the United States should approve the sale of F-16s to Pakistan. This will provide Pakistan with an advanced fighter capability and a potential to counter India's increasing air superiority over Pakistan. India's procurement of the AWACS will give it a significant ISR advantage over Pakistan, and to counter this advantage and to ease Pakistan's sense of vulnerability the United States should sell similar technology to Pakistan. This would be a significant step towards decreasing Pakistan's sense of insecurity by providing it with a capability that would allow a rapid and efficient response to an Indian air attack by effectively managing and coordinating the air-to-air battle.

If Pakistan does not obtain an airborne early warning (AEW) capability, it may pursue an avenue such as the one recommended by Pakistan's Air Commodore (Retd.) Shahid Kamal Khan. His recommendation is to substantially increase its arsenal of drones, decoy, spurious track generators, and electronic emitters that duplicate radar signatures of strike aircraft, in order to generate false alarms that will generate real

[175] Rajagopalan, "Neorealist Theory–II," 2.

responses and lead to the depletion of Indian inventory and will.[176] This, however, is a dangerous and risky undertaking for two nations with nuclear capabilities. Misunderstandings and over-reactions by one or both sides could potentially lead to disastrous consequences. A significant military disparity can lead to an unstable regional arms race as Pakistan procures more nuclear weapons in efforts to compensate for India's growing conventional advantage, and lowers its nuclear threshold in order to deter India, resulting in an overall increased instability in the region.

If India continues its military modernization, increasing the military capabilities gap between itself and Pakistan, it will lead to greater Pakistani insecurity and Pakistan will continue to attempt to correct the imbalance of power. This will lead to greater instability in the region. An effective U.S. policy should diligently address this imbalance of power, which will address and likely resolve the historical conflicts between India and Pakistan, and prevent regional destabilization. Decreasing the significant military capabilities gap between the two countries may be the best option for attaining diplomatic peace.

176 Air Commodore (Retd.) Shahid Kamal Khan, "Early Warning - The Phalcon "Phallacy", (August 2004), http://www.pakdef.info/forum/showthread.php?t=4992 (14 March 2005).

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