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THE INDIAN AIR FORCE IN THE KARGIL WAR

BENJAMIN S. LAMBETH

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"A dispassionate and outstanding account of the IAF's role in the 1999 Kargil conflict—the best I have read so far. It amply demonstrates how the use of airpower speeded up the eviction of the Pakistani intruders, which was our ultimate national goal."

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Air Component Commander during the 1999 Kargil War

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Admiral Arun Prakash, Indian Navy (ret.)
Chairman, Chiefs of Staff Committee and Chief of Naval Staff,
2004–2006

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ACKNOWLEDGMENTS

This assessment is an outgrowth of three week-long trips I made to India in 2008, 2009, and 2010 at the invitation of Air Commodore Jasjit Singh, IAF (ret.), the founding director of the Centre for Air Power Studies in New Delhi, to deliver a succession of presentations at his organization's annual international airpower conferences. During those three visits, in connection with a still-in-progress RAND study of mine on India's emerging air posture for the U.S. Air Force, I had opportunities to have extensive conversations with a substantial cross-section of serving and retired IAF leaders to gain first-hand insights into the IAF's evolution, force development plans, concepts of operations, organizational culture and style, and actual combat experience during India's 1999 war against Pakistan in the Himalayas. They included the current Chief of the Air Staff, Air Chief Marshal Norman A. K. Browne, as well as three of his predecessors, Air Chief Marshals (ret.) Pradeep Naik, Fali Homi Major, and S. P. Tyagi. They further included three former air vice chiefs, Air Marshals (ret.) Pranab Barbora, Ajit Bhavnani, and Satish Inamdar; Air Marshal S. C. Mukul, Chief of the Integrated Defense Staff; Air Marshal (ret.) Pramod Mehra, former Air Officer Commanding-in-Chief (AOC-in-C) of Southwestern Air Command; Air Marshals (ret.) Vinod Bhatia and Vinod Patney, former AOCs-in-C of Western Air Command; Air Marshal (ret.) T. M. Asthana, former Commander in Chief of Strategic Command; Air Marshal M. Matheswaran, now Senior Air Staff Officer at Eastern Air Command; and Air Vice Marshal Arjun Subramaniam, then Officer Commanding at Air Force Station Hindon. I also had several informative conversations during that period with Air Commodore Jasbir Walia, then the Indian Air Force attaché to the United States in Washington, D.C.

While continuing my research and writing in connection with the larger above-noted RAND study after having left RAND to become affiliated with the Center for Strategic and Budgetary Assessments in mid-2011, it occurred to me that because so little had been written about the air contribution to India's Kargil War even a decade and more later, that topic was worth exploring in a fuller separate study in its own right. This monograph is the final result of that realization. For their helpful comments and suggestions regarding several earlier iterations of it, I wish to thank Admiral Arun Prakash, Indian Navy (ret.), a fighter pilot and former Chairman of the Chiefs of Staff Committee and Chief of the Naval Staff; Air Chief Marshal Major; Air Marshals Bhatia, Matheswaran,

and Patney; Air Vice Marshal Subramaniam; Major General G. D. Bakshi, Indian Army (ret.), deputy director for research at the Vivekanananda International Foundation in New Delhi; Air Commodore Singh; Ramesh Thakur, Asia-Pacific College of Diplomacy at the Australian National University's College of Asia and the Pacific; and Ashley J. Tellis of the Carnegie Endowment for International Peace, who also kindly made possible the publication of this study as a Carnegie product. For their helpful insights from an operational perspective, I also am indebted to two still-serving IAF fighter pilots who were successive international students at the U.S. Air Force's School of Advanced Air and Space Studies at Maxwell Air Force Base, Alabama, in 2011 and 2012. The first is one of the IAF's most experienced Jaguar pilots. The second flew combat missions in the Mirage 2000H as a junior officer during the Kargil War. All of the above-noted individuals contributed immensely to the richness of my understanding of today's Indian Air Force and its role in the 1999 Kargil campaign. As always, however, responsibility for any errors of fact or interpretation that may remain in the assessment that follows is mine alone.

Shorter versions of this monograph appeared as "Airpower in India's 1999 Kargil War" in the *Journal of Strategic Studies*, vol. 35, no. 3, June 2012 and "Air War at the Top of the World" in *Air Force Magazine*, September 2012.

FOREWORD

In the spring of 1999, the world slowly became aware of Pakistan's foray into the Kargil-Dras sector of the disputed state of Jammu and Kashmir, a provocation that would incite the limited war now known as the "Kargil conflict." This clash represented a watershed in Indo-Pakistani security relations because it demonstrated that even the presence of nuclear weapons might not dampen the competition that has persisted historically between the region's largest states. But the conflict distinguished itself in other ways as well, especially in the scale and type of military operations.

Although past struggles for advantage along the disputed borders outside of declared wars invariably involved small infantry elements on both sides, the Kargil conflict was unique both in the number of major Indian land formations committed to the struggle and New Delhi's decision to employ airpower. The role of airpower, however, was tinged with controversy from the very beginning. Both during and immediately after the conflict, it was not clear whether the Indian Air Force (IAF) leadership of the time advocated the commitment of Indian airpower and under what conditions, how the IAF actually performed at the operational level and with what effects, and whether the employment of airpower was satisfactorily coordinated with the Indian Army at either the strategic or the tactical levels of war. Whether airpower proved to be the decisive linchpin that hastened the successful conclusion of the conflict was also uncertain—but all these questions provided grist for considerable disputation in the aftermath of the war.

What the Kargil conflict demonstrated, however, was that airpower was relevant and could be potentially very effective even in the utterly demanding context of mountain warfare at high altitudes. At a time when India is compelled to think seriously about the security challenges posed by China's continuing military modernization—especially as it affects India's ability to protect its equities along the formidable Himalayan borderlands—a critical assessment of the IAF's contributions to the Kargil conflict is essential and in fact long overdue. Various partial analyses have appeared already; they are indispensable because they address several specific dimensions of IAF operations ranging from the early debates about strategy and the political impact of employing airpower to overcoming the various difficulties that the IAF had to surmount in quick order if its instruments of combat were to make a useful contribution to the success of India's national aims. The combat capabilities brought to bear in the airspace above the

mountain battlefields, obviously, constituted only the visible tip of the spear; a vast and often invisible system of organization and support involving everything from managing intratheater airlift to redeploying combat squadrons to planning and coordinating operations to improvising technical fixes amidst the pressure of combat were all implicated in airpower's contribution to the Kargil War.

This story has never been told before in depth or with comprehensiveness and balance—yet it deserves telling both because it sheds light on an important episode in Indian military history and because its lessons have implications for managing the more demanding threats that India is confronted with in the Himalayas. This monograph by Benjamin Lambeth advances both aims admirably. It represents a serious scholarly effort to understand how the IAF actually performed at Kargil and is exemplary for the meticulousness of its research, the political detachment of its analysis, and its insights which could come only from one of America's premier analysts of airpower, who also happens to have accumulated extensive flight experience in more than three dozen different types of combat aircraft worldwide since 1976. Lambeth's *oeuvre*—manifested during a distinguished career of over forty years (most of it at RAND)—has always been wide-ranging: in addition to his many writings on airpower and air warfare, it has included seminal studies on Soviet military thought; nuclear deterrence, strategy and operations; geopolitics in the superpower competition; and the evolution of military technology and its impact on warfighting.

Given his diverse interests and his formal academic training at Georgetown and Harvard, it is not surprising that Lambeth's study ranges across multiple levels of analysis, from the geopolitical to the tactical. This broad approach permits him to cover airpower's contribution to the conflict in extraordinary detail. It relies not simply on the published record but also on detailed interviews with the IAF's leadership and its combat cadres as well as on extensive communications with a host of participants from the other services involved in the war, all brought together in a seamless and coherent analytical narrative. As the result, the report is simultaneously a chronicle of what the IAF actually did and a fair evaluation of both its achievements and its shortcomings. National security analysts in the United States and in India, as well as policymakers in both countries, would do well to read the monograph carefully because of its judgments about IAF capabilities and the paths implicitly suggested for future U.S.-Indian defense (and in particular airpower) cooperation.

The South Asia program of the Carnegie Endowment for International Peace is privileged to publish Lambeth's report. I am especially grateful to the Indian Council for Cultural Relations for supporting the Endowment's ongoing research on Indian security.

–Ashley J. Tellis
Senior Associate
Carnegie Endowment for International Peace

SUMMARY

High in the mountains of Indian-controlled Kashmir in 1999, India and Pakistan fought in an intense border clash for limited but important stakes. Overshadowed by NATO's higher-profile air war for Kosovo, the Kargil War ensued for seventy-four days at a cost of more than a thousand casualties on each side. Yet it remains only dimly appreciated by most Western defense experts—and barely at all by students and practitioners of airpower.

Nevertheless, it was a milestone event in Indian military history and one that represents a telling prototype of India's most likely type of future combat challenge. The Kargil conflict was emblematic of the kind of lower-intensity border skirmish between India and Pakistan, and perhaps also between India and China, that could recur in the next decade in light of the inhibiting effect of nuclear weapons on more protracted and higher-stakes tests of strength.

The experience offers an exemplary case study in the uses of airpower in joint warfare in high mountain conditions and is key to a full understanding of India's emerging air posture. It is the one instance of recent Indian exposure to high-intensity warfare that provides insights into the Indian Air Force's (IAF's) capabilities, limitations, relations with its sister services, and interactions with India's civilian leadership.

The Kargil conflict offers an exemplary case study in the uses of airpower in joint warfare in high mountain conditions and is key to a full understanding of India's emerging air posture.

In the Kargil War, the IAF rapidly adapted to the air campaign's unique operational challenges, which included enemy positions at elevations of 14,000 to 18,000 feet, a stark backdrop of rocks and snow that made for uncommonly difficult visual target acquisition, and a restriction against crossing the Line of Control that forms the border with Pakistan. Without question, the effective asymmetric use of IAF airpower was pivotal in shaping the war's successful course and outcome for India. Yet the conflict also highlighted some of India's military shortcomings. The covert Pakistani intrusion into Indian-controlled Kashmir that was the *casus belli* laid bare a gaping hole in India's nationwide real-time intelligence,

surveillance, and reconnaissance capability that had allowed the incursion to go undetected for many days. It further brought to light the initial near-total lack of transparency and open communication between the Indian Army's top leaders and the IAF with respect to the gathering crisis.

All things considered, the conflict was a poor test of India's air warfare capability. Despite the happy ending of the Kargil experience for India, the IAF's fighter pilots were restricted in their operations due to myriad challenges specific to this campaign. They were thus consigned to do what they could rather than what they might have done if they had more room for maneuver.

On a strategic level, the Kargil War vividly demonstrated that a stable bilateral nuclear deterrence relationship can markedly inhibit such regional conflicts in intensity and scale—if not preclude them altogether. In the absence of the nuclear stabilizing factor, those flash points could erupt into open-ended conventional showdowns for the highest stakes. But the Kargil War also demonstrated that nuclear deterrence is not a panacea. The possibility of future conventional wars of major consequence along India's northern borders with Pakistan and China persists, and the Indian defense establishment must plan and prepare accordingly.

INTRODUCTION

> "Aviators have traditionally been a haughty breed. They are used to spending solitary hours with their machines, aloof, on top of the world, far removed from its mundane troubles. Everything that seemed important on terra firma becomes so much smaller. In the cockpit, few things can humble this pride. The mountains can. When you fly at the roof of the world and still have the impassive peaks of the mighty Himalayas look down on you at Flight Level 200, your perspective changes. The experience of air warfare in mountains teaches stern lessons. The aviator must respect the mountains."[1]
>
> *–An Indian Air Force Mirage 2000 pilot who flew in the Kargil War*

The Indian Air Force (IAF) is the world's fourth-largest air service, operating more than 1,300 aircraft out of some 60 bases nationwide. It also is one of the world's oldest continuously functioning air forces, with roots going back to October 8, 1932, when it was established by Great Britain's Royal Air Force as an auxiliary of the Indian Empire during the time of the British Raj.[2] Until the early 1990s, it was principally a support entity for the Indian Army.[3] Today, it has acquired independent strategic missions, most notably including those of nuclear deterrence and retaliation, and it is a diversified fighting force with manifest ambitions toward global reach and status. It also is a full-spectrum combat air arm with a precision conventional strike capability, fielding not only fourth-generation multirole fighters, but also force-extending tankers, a recently acquired airborne warning and control system capability, intertheater airlifters, unmanned aerial vehicles equipped with multispectral sensors for long-dwell strategic and tactical reconnaissance, and the beginnings of a military space surveillance capability.

The field of strategic regard in which this maturing force most centrally figures now extends from the east coast of Africa to Sumatra and the entire Indian Ocean operating area. Like few other air arms around the world, the IAF operates over the most diverse range of geographic areas, from the Siachen glacier in the north to the deserts, jungles, and oceans that surround India's periphery. A former air officer commanding-in-chief

(AOC-in-C) of the IAF's Western Air Command well captured the IAF leadership's now oft-expressed characterization of the steadily modernizing service when he wrote in 2009 of the IAF's "growing aspirations to transform itself from a mere subcontinental tactical force to an intercontinental strategic aerospace power in conformity with other leading air forces in the world."[4]

India's principal external challengers—and hence the IAF's main objects of strategic and operational concern—are China and Pakistan, in that order. China is generally regarded by the Indian defense community as posing a more downstream source of potential trouble, whereas Pakistan is deemed both a longer-term *and* a here-and-now threat to the country's security.[5] Because both India and its two leading rivals all possess well-stocked inventories of readily available nuclear weapons, most planners in New Delhi assess the likelihood of an all-out war on the subcontinent as being quite low. The uppermost concern of the IAF leadership with respect to combat readiness today entails operating decisively at a conventional level against either rival when all sides in any conflict will be within immediate reach of a nuclear response option.

Given this omnipresent risk of escalation, most Indian threat assessors believe that any future combat engagement with either China or Pakistan will, in all likelihood, be sharp and intense but also brief and for limited stakes. In this regard, an official IAF publication released in 2007 frankly acknowledged the "likely short duration" of any war that India may have to contend with in the near-term future.[6] The most probable prospect, according to retired IAF Air Commodore Jasjit Singh, is for "prolonged periods of peace with spurts of armed violence of great variety."[7]

In a thoughtful enumeration of the diverse conflict possibilities that could confront Indian security planners in the next decade, a retired IAF air marshal in 2007 listed as being among the most plausible of those possibilities an extended border war with China, with little likelihood of nuclear weapons use; a shorter and more intense war with Pakistan entailing a very real chance of nuclear use—unlike India, Pakistan has never proclaimed a nuclear no-first-use policy; a simultaneous war with China and Pakistan operating in collusion; and a prolonged lower-intensity war in Kashmir against both Pakistani regular forces and indigenous Kashmiri insurgents.[8]

An instructive preview of this last type of conflict scenario can be seen in the Kargil War that unfolded in the high mountains of Indian-controlled Kashmir in May, June, and July 1999. That intense border clash for limited but important stakes, which ensued for seventy-four days at a cost of more than a thousand casualties on each side, was overshadowed by NATO's higher-profile air war for Kosovo that occurred thousands of miles away in the Balkans at roughly the same time. In large part because of that more attention-getting distraction, the Kargil War remains only dimly appreciated by most Western defense experts—and barely at all by students and practitioners of airpower.

Nevertheless, it was a milestone event in Indian military history and one that represents a telling prototype of India's most likely type of future combat challenge in the immediate years ahead.[9] No less important, it offers both an exemplary case study in the uses of airpower in joint warfare and a particularly revealing testament to the special difficulties of modern air employment in high mountain conditions.[10] The Kargil experience is key to a proper understanding of India's emerging air posture because it constitutes the one instance of recent Indian exposure to high-intensity warfare that provides insights into the IAF's capabilities, limitations, relations with its sister services, and interactions with India's civilian leadership. The conflict was also emblematic of one type of border skirmish between India and Pakistan, and perhaps also between India and China, that could recur in the next decade in light of the inhibiting effect of the nuclear overhang on more protracted and higher-stakes tests of strength. As retired Air Commodore Singh reflected on the experience six years after its successful conclusion for India, the conflict was "a typical example of a limited war in a nuclear weapons environment."[11] For all these reasons, Western defense professionals have much to gain from a closer inquiry into this little-known chapter in the history of air warfare.

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PRELUDE TO A SHOWDOWN

Flare-ups along the border between Pakistan and India have a long history, going back as far as 1947 when British rule of the subcontinent ended and the former British Indian Empire was subdivided into the newly independent Union of India and the Dominion of Pakistan. That development prompted Pakistan to launch a guerilla incursion into Kashmir in an attempt to establish control over the contested region. The Indian Army and the IAF countered in force by entering Kashmir and driving the Pakistani-sponsored irregulars out of all but a small portion of the high mountain state.[12]

The seeds of the Kargil conflict were first planted in March and April 1999. Then, determined units of the Pakistan Army crossed the Line of Control (LoC) into the Indian portion of contested Kashmir in the remote and rugged Himalayan heights overlooking Kargil between the Kashmir Valley and the Ladakh plateau. The LoC running through Jammu and Kashmir that separates the Indian-held and Pakistani-controlled portions of

the disputed territory (shown in Figure 1) is a long-standing product of the third Indo-Pakistani war that created Bangladesh. It bisects some of the most forbidding terrain to be found anywhere in the world, with most of the main ridgelines being offshoots of K2, the world's second-highest mountain.

While preparations were under way for an upcoming meeting of India's and Pakistan's prime ministers in Lahore, Pakistan, senior leaders in the Pakistan Army, led by the chief of the Army Staff, General Pervez Musharraf, and the chief of the General Staff, Lieutenant General Mohammed Aziz, were conducting initial reconnaissance and laying the logistical groundwork for the impending operation. The most likely aim of the planned gambit, apart from seeking to internationalize the Kashmir issue in Indo-Pakistani relations, was to take control of India's sole line of communication to troops on the Siachen glacier by obstructing the use of the key two-lane national highway NH-1A in Ladakh running from Srinagar through Kargil to Leh. It provided access to the IAF's airfield at Thoise on the axis to Siachen.[13]

FIGURE 1. AREA OF OPERATIONS FOR THE 1999 KARGIL WAR

Source: *Air Power Journal*

Used with permission.

The incursion's planners took full advantage of the relaxed atmosphere that had come to prevail in New Delhi after the visit of Prime Minister Atal Vajpayee to Pakistan to help promulgate the Lahore Declaration, which was signed by Vajpayee and his Pakistani counterpart, Nawaz Sharif, on February 21. With it, the governments of both countries swore their commitment to the vision of peace and stability embodied in the United Nations charter.[14] The Pakistan Army leaders chose to exploit the nascent, and ultimately short-lived, feeling of goodwill that had emanated from that declaration in a way that might irreversibly change the status quo along the LoC to Pakistan's advantage.

Because of the capricious weather that predominates in the area, the Indian Army during the harshest winter months that immediately preceded the Kargil crisis vacated its most inhospitable forward outposts—typically at elevations of 14,000 to 18,000 feet—that were normally manned on India's side of the LoC throughout the remainder of the year. Since substantial gaps existed in India's defenses in the segment of Kashmir that lay on both sides of the LoC, a segment featuring very few trails leading off from the main roadways, the Pakistani planners thought the vacated outposts made prime targets for seizure. Adding further to the attractiveness of the planned gambit, the outposts were situated on easily defended high ground that Indian troops would have to attack from below in order to try to recapture them. A clever mix of regular combat troops and local civilian porters would infiltrate the area and present the Indian government with a fait accompli in Kashmir.

Pakistan's military leaders were all but surely emboldened by their country's acquisition of a nuclear weapons delivery capability within the preceding year. They may also have been encouraged by a derivative belief that the awareness of that capability in key leadership circles in New Delhi would more than offset any conventional military advantage India enjoyed in the region.[15] And even if the operation were to be detected by India while it was still in progress, the incursion's planners likely judged that the Indian Army's reaction to it would be slow and limited at best. Most important, they probably took it as a foregone conclusion that were India to seek to conventionalize the ensuing conflict, pressure from the international community would quickly intervene and force the Vajpayee government to cease combat operations within a week, thus leaving Pakistan "comfortably in possession of gains it would make by infiltration," in the words of retired Indian Army Major General G. D. Bakshi.[16]

Ultimately, in what turned out to be a phased infiltration in uniquely challenging mountain terrain, Pakistani troops moving by foot and helicopter occupied roughly 130 outposts on India's side of the LoC before the intruders were first detected by local shepherds on May 3.[17] At least eighteen artillery batteries, most of them from across the LoC in Pakistani-controlled territory, were said to have supported the operation. Indian sources later reported that the occupying force numbered from 1,500 to 2,000 combatants, with perhaps four to five times that many troops mobilized to help supply the most forward elements on the Indian side of the LoC. The occupying troop contingent

consisted mainly of elements of the local Pakistan Army Northern Light Infantry (NLI) and members of Pakistan's elite Special Services Group, with many outfitted in civilian garb so as to appear as indigenous Kashmiri mujahideen. The intruders were well armed, well trained in mountain warfare, and accustomed to operating at high elevations.[18]

India's security principals and other informed experts have freely admitted that the Pakistan Army achieved "complete strategic and tactical surprise" in its execution of the incursion, owing to its having relied on in-place NLI formations rather than moving in a heavier troop contingent that would have generated a larger deployment signature.[19] The incursion's organizers further sought plausible deniability of any culpability for their aggressive action through the use of a shrewd deception measure. They generated indigenous militant Islamist radio traffic within Pakistani-occupied Kashmir to convince Indian signals intelligence monitors that the incursion was insurgent activity over which Pakistan had no control.[20] Finally, the intruders took special care to move only at times that would allow them to avoid detection by periodic Indian winter air surveillance operations.[21]

As the Indian Army units that had manned the temporarily vacated outposts began returning to their stations during the first week of May, they slowly discovered the full extent of the occupation of those positions by Pakistani troops. The Indian Army's 121st Infantry Brigade assigned to monitor the LoC above Kargil launched a succession of probing patrols on May 5 that confirmed the infiltration. The full scale of the intrusions was validated on May 8 by IAF pilots in Cheetah light helicopters as they flew surveillance sorties along the Tololing ridge in the Dras subsector of the Kargil region.[22]

It took more than a week in all for the Indian Army to take stock of its challenge at hand and to develop the beginnings of a course of action to drive the invaders out. Even then, the army's local commanders grossly underestimated and, accordingly, misreported the full magnitude of the situation they were facing. As late as May 19, Lieutenant General Krishan Pal, the commander of 15 Corps that represented the Indian Army's main fighting presence in Kashmir, was said to have been "blissfully oblivious [of] the deathly situation." At a key Unified Headquarters meeting in Srinagar to discuss next steps for addressing the situation, he predicted that in the coming showdown, the incursion "would be defeated locally."[23] Other reporting up the line by the Indian Army offered soothing assurances that "the infiltration will be vacated in 48 hours."[24] Clearly, local ground commanders in Kargil and Srinagar did not appreciate the full gravity of the Pakistani challenge at the start of the gathering crisis.

Once they understood more fully what had transpired along the LoC, the army's leaders finally responded by moving five infantry divisions, five independent brigades, and 44 battalions from the Kashmir Valley to the Kargil sector, ultimately mobilizing some 200,000 Indian troops in all. Most of this buildup occurred during the three weeks between the initial detection of the incursion and the eventual start on May 26 of a major

joint counteroffensive code-named Operation Vijay (meaning "victory" in Hindi). The avowed objectives were to drive out the intruding forces and to restore the LoC to its previous status. The response was almost certainly more determined than anything the Pakistan Army leaders had anticipated.[25]

ENLISTING THE IAF'S INVOLVEMENT

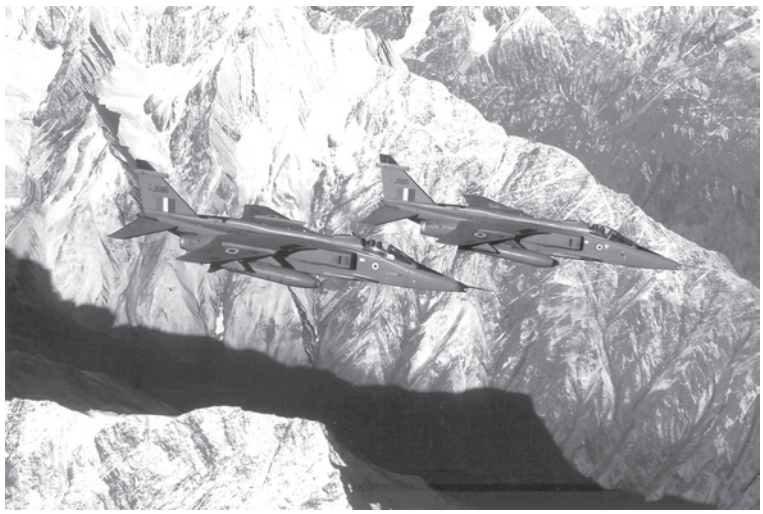
After several early firefights with the entrenched Pakistanis that occasioned numerous Indian fatalities in an unsuccessful bid to recapture the closest of the occupied positions, the Indian Army approached the IAF on May 11 and asked it to help turn the tide through a commitment of armed helicopters to support the embattled ground troops.[26] Conflicting views persist to this day regarding what happened over the ensuing two weeks after that initial army entreaty with respect to when and how the IAF should become involved in the conduct of India's looming counteroffensive.

One view maintains that the IAF initiated combat operations over Kargil only "reluctantly" and sought "to avoid involvement in the conflict altogether, claiming inexperience in mountain warfare and unfamiliarity with the terrain, as well as the risk associated with the heightened SAM [surface-to-air-missile] threat in the mountains." That view holds that the IAF committed itself to the fight only after an insistent demand for such involvement from the Indian Army leadership.[27] This interpretation drew much of its claim to veracity from an assessment by an Indian civilian defense writer that appeared shortly after the war ended. The writer alleged that once the extent of the Pakistani intrusions was discovered, the IAF at first "side-stepped requests by the army to attack the infiltrators" and agreed to lend its support to the ongoing fighting only after its leadership "was presented with a *fait accompli* and pressed [presumably by higher government authority] into making attacks on May 26."[28]

In truth, the IAF began conducting initial reconnaissance sorties over the Kargil heights as early as May 10, less than a week after the presence of the enemy incursion was first confirmed by Indian Army patrols. It also began deploying additional aircraft into the Kashmir Valley in enough numbers to support any likely combat tasking, established a rudimentary air defense control arrangement there because there were no ground-based radars in the area, and began extensive practice of air-to-ground weapons deliveries by both fighters and attack helicopters at Himalayan target elevations.[29] On May 12, an IAF helicopter was

fired upon near the most forward-based Pakistani positions overlooking Kargil and landed uneventfully with a damaged rotor. That hostile act prompted Air Headquarters to place Western Air Command, the IAF unit responsible for the Jammu and Kashmir sectors, on heightened alert and to establish quick-reaction aircraft launch facilities at the IAF's northernmost operating locations at Air Force Stations Srinagar and Avantipur.[30]

The next day, IAF Jaguar fighters conducted tactical reconnaissance sorties in the Kargil area to gather prospective target information using their onboard long-range oblique photography systems, and a forward direction center for the tactical control of combat aircraft was established at the IAF's highest-elevation airfield at Air Force Station Leh.



A two-ship element of Jaguars on patrol over the Himalayan ridgelines, indicating the stark terrain folds in the Kargil heights that were soon to complicate IAF strike operations so severely.

Concurrently, Canberra PR57 and MiG-25R reconnaissance aircraft were pressed into service over Kargil, and electronic intelligence missions began to be flown regularly by the IAF in the vicinity of the detected intrusion and beyond.[31] Finally, on May 14, Air Headquarters activated the IAF's air operations center for Jammu and Kashmir and mobilized its fielded forces in that sector for a possible all-out air counteroffensive.[32] At the same time, in close conjunction with their 15 Corps counterparts, Western Air Command planners developed a tailored concept of operations for kinetic air employment in the Kargil heights that included target-selection procedures, force deconfliction and other safety criteria, and an arrangement for conducting and communicating prompt battle damage assessment. From the very start, the IAF expected that it would be engaged in earnest against the intruders just as soon as it and the army leadership could agree on a final course of action. As the AOC-in-C of the IAF's Western Air Command at the time, Air Marshal Vinod Patney, later affirmed, "we were ready for a full-fledged war and had been for some days before May 25, 1999, when government clearance [to commit the IAF to combat] was received."[33]

In an effort to set the record straight once and for all, since-retired Air Chief Marshal Anil Tipnis, who was chief of the Air Staff at the time of the incursion and who later oversaw the IAF's response, offered a detailed reconstruction in October 2006 of his own recollections regarding the sequence of events during the high command's initial deliberations about the Kargil crisis. As Tipnis recalled, on May 10, a full week after the incursion was first detected and the Indian Army had attempted an initial armed response on its own, his vice chief, Air Marshal Prithvi Singh Brar, informed him of a report passed up the line that morning by the IAF's assistant chief of staff for intelligence that the army "may be in some sort of difficulties in the Kargil area." Queried by Tipnis as to the nature of the rumored difficulties, the vice chief replied that he was not sure but that "there reportedly was unusual artillery firing."[34]

Tipnis learned later that day that the ground force organization responsible for the Kargil sector, Northern Army Command, had communicated nothing of its ongoing operations to its assigned provider of air support in case of hostilities along the LoC, the IAF's Western Air Command. The next day, Tipnis's vice chief told him that his army counterpart had indicated that the army "could handle the situation." Tipnis further learned that Northern Army Command had asked the local air officer commanding (AOC) for Jammu and Kashmir to provide immediate fire support by Mi-25 and Mi-35 helicopter gunships and armed Mi-17 helicopters to "evict a few 'intruders' who had stepped across the LoC in the Kargil sector." The AOC replied that the high terrain over which the requested support was to be provided lay above the effective operating envelope of the helicopters.[35] He added that if the army genuinely needed significant air support for its operations, it would need to convey that requirement to higher headquarters for detailed consideration and approval.

In the meantime, Tipnis's vice chief again pulsed his army counterpart as to whether Northern Army Command really needed help from the IAF. As Tipnis recalled, the army vice "had expressed the army's ability to manage, but was upset that AOC Jammu and Kashmir had not acceded to Headquarters Northern Command's fire-support demand." At that, Tipnis recalled, "there was no doubt in my mind that the situation was desperate." Because committing airpower in close proximity to the LoC could dangerously escalate the conflict, Tipnis insisted that the army "needed political clearance" before the IAF could provide the requested fire support. He also ruled out any employment of IAF armed helicopters because they would be "sitting ducks" for enemy infrared surface-to-air-missile fire. Fixed-wing fighters, he said, would be essential for mission effectiveness, and the IAF "reserved the prerogative to give fire support in the manner it considered most suitable." To this, the army vice chief responded that "the army was capable of throwing back the intruders on its own" but, as Tipnis recalled, that doing so would take time and that air support from the IAF would hasten the process. The army vice continued to insist that such support be provided solely in the form of armed helicopters.[36]

Facing this continued impasse in his dealing with the army, Tipnis called a meeting of his most senior subordinates at Air Headquarters on May 15 to review the known events as they had played out thus far. After being briefed on the situation, the air chief issued this assessment and direction:

> I observed that the ground situation was grave. Army required air force help to evict the intruders. Army Headquarters was reluctant, possibly because it was embarrassed to have allowed the present situation to develop, to reveal the full gravity of the situation to the Ministry of Defence. Thus it was not amenable to Air Headquarters' position to seek government approval for use of airpower offensively.[37]

Tipnis then reiterated his determination that despite the army's continued insistence on the use of helicopters in a fire-support role, such use would continue to be denied by the IAF because the helicopters "would be vulnerable in the extreme."[38]

The following day, Tipnis met with the army vice chief at the latter's request (the army chief, General Ved Malik, was out of the country on official travel). The army vice chief once again pressed his request for immediate support by armed helicopters. Air Marshal Patney proposed that Tipnis call a Chiefs of Staff Committee meeting to seek high-level closure once and for all on the IAF's involvement in the coming counteroffensive. In the meeting, Tipnis reiterated the need for prior government approval for any introduction of Indian airpower into the looming fight, since the chance that such a commitment could trigger a major escalation of the fighting was, in his view, very high.[39]

As for the manner in which the army had responded to the crisis in its assessment and conduct up to that point, Tipnis recalled that there had been a

> total lack of army-air force joint staff work. When the army found itself in difficulties, information/intelligence had not been communicated by Army Headquarters in any systematic manner to Air Headquarters. There had been no call for a joint briefing, leave alone joint planning, both at the service and command headquarters; just repeated requests for armed helicopter support.… There had been no joint deliberations at any level.[40]

On May 23, General Malik, having since returned to New Delhi, summoned Tipnis and the chief of the Naval Staff, Admiral Sushil Kumar, to his office. As Tipnis recalled,

> His main thrust was that we needed to put up a united front to the CCS [Cabinet Committee on Security].… Ved said the air force had to join in as the army was in a difficult position. I told him that there was no doubt of that and the air force was very keen to join in, my only reservation being in respect of the use of helicopters—they would be too vulnerable.

After going back and forth with Tipnis on the helicopter issue, General Malik retorted, "If that's the way you want it, I will go it alone." Tipnis eventually gave in "against [his] better judgment" out of a desire "to save army-air force relations."[41]

The next day, the Chiefs of Staff Committee met and adopted a unanimous stance regarding what should be done with respect to the intrusion. In the end, it took the incontrovertible evidence of the reconnaissance imagery provided by the IAF and by other sources for the army chief to realize the full extent of the problem and to agree to take the issue to the prime minister.[42]

During a pivotal May 25 meeting of the Cabinet Committee on Security (whose members were the prime minister, defense minister, home minister, finance minister, and external affairs minister) chaired by Prime Minister Vajpayee, General Malik explained the seriousness of the situation in the Kargil sector and the need for the IAF "to step in without delay." At that, Vajpayee reportedly said: "OK, get started tomorrow at dawn." Tipnis then asked the prime minister for permission to cross the LoC while attacking enemy targets on India's side of the LoC. To that, Vajpayee responded adamantly: "No. No crossing the LoC."[43] With that binding rule of engagement firmly stipulated by the civilian leadership, the die was finally cast for full-scale IAF involvement in the counteroffensive. Later the same day, Tipnis paid an incognito visit to the IAF's main operating base in Kashmir at Srinagar for an on-scene assessment of the situation. While there, he personally assured the commander of 15 Corps that his troops taking fire would receive all needed air support.[44]

To be sure, Tipnis's seemingly conclusive firsthand recollection in no way closed the books on the interservice contretemps over the delay in getting the IAF engaged in the campaign. On the contrary, while not contesting the basic facts as outlined by the air chief, a former Indian Army vice chief lambasted Tipnis for, among other things, having refused to honor Northern Army Command's request for immediate on-call attack helicopter support, having voiced allegedly baseless concern over the chance that the introduction of airpower could result in escalation, and having delayed IAF involvement in the fighting until political approval by the Cabinet Committee on Security was first sought and granted.[45] The former army vice chief went on to author an even more outspoken litany of similar complaints in 2009, which prompted, in close succession, a point-by-point rebuttal by a retired IAF air marshal; a riposte against that rebuttal from the former army vice chief; and a more authoritative rebuttal from another retired air marshal who had been the AOC for Jammu and Kashmir during the lead-up to and conduct of the Kargil operation.[46] Despite the testy interservice back and forth both at the outset of planning for the campaign and later, the IAF was fully prepared for the looming conflict. It had been busy almost from the first day of the incursion's discovery marshaling its assets and positioning them to show how India's air arm might make an effective difference in the gathering confrontation.

INITIAL AIR OPERATIONS

Less than a week before the start of Operation Vijay, on May 21, the IAF had launched a Canberra PR57 from 106 Squadron to conduct a reconnaissance of the besieged area that overlooked highway NH-1A and the adjacent town of Kargil. While descending to 22,000 feet just two miles from the LoC, which put the aircraft as low as 4,000 feet above the highest ridgelines, the Canberra sustained a direct hit in its right engine by what was later determined to have been a Chinese-made Anza infrared surface-to-air missile.[47] From that moment onward, the IAF leadership knew without doubt that it was nearing the brink of a major combat involvement.

The initial attacks marked the first time that the IAF had expended ordnance in combat in Kashmir since its early-generation Vampire jet fighters destroyed Pakistani bunkers in the Kargil sector in December 1971.

Kinetic air operations began in earnest at 0630 on May 26 with six attacks in succession by two-ship elements of MiG-21, MiG-23, and MiG-27 fighters against intruder camps, materiel dumps, and supply routes in the general areas overlooking Dras, Kargil, and Batalik. These initial attacks marked the first time that the IAF had expended ordnance in combat in Kashmir since its early-generation Vampire jet fighters destroyed Pakistani bunkers in the Kargil sector in December 1971. The IAF fighters that were pressed into these first-day attacks conducted 57mm rocket attacks and strafing passes against enemy targets. A second wave of air attacks began that afternoon, followed by high-altitude reconnaissance overflights by Canberra PR57s and subsequent low passes by MiG-21Ms to conduct near-real-time battle damage assessment.[48]

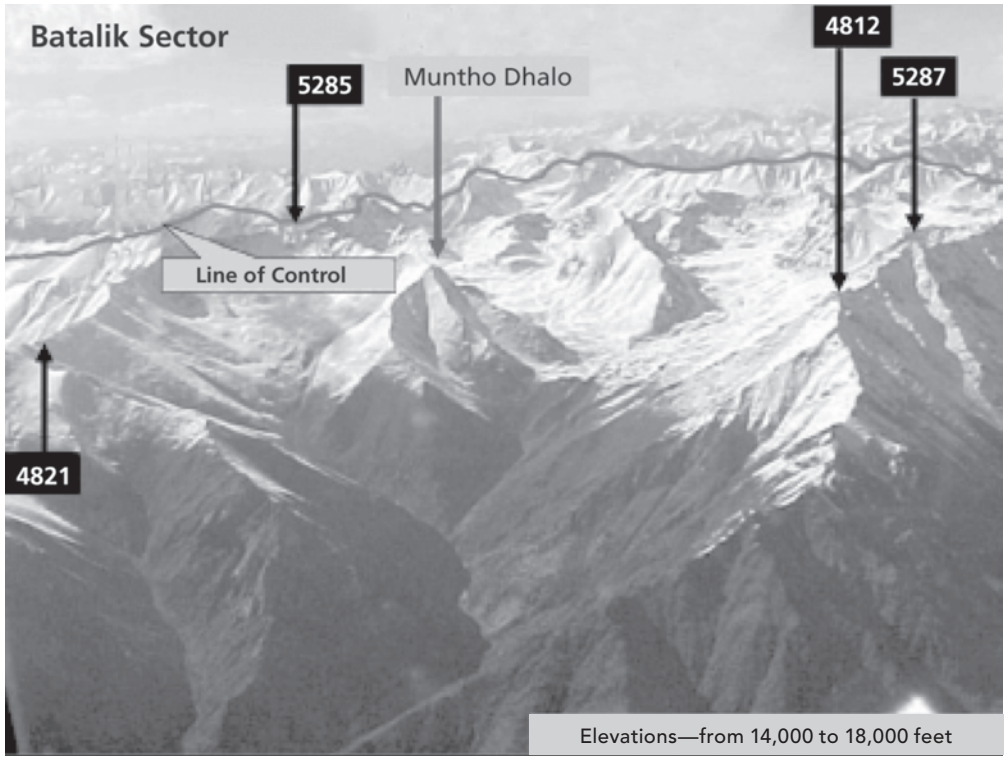
Nearly all of the targets selected for attack in those initial strikes were on or near jagged ridgelines at elevations ranging from 14,000 to 18,000 feet. (See Figure 2 for a graphic portrayal of the high mountain terrain.) The stark backdrop of rocks and snow made for uncommonly difficult visual target acquisition, complicated further by the small size of the enemy troop positions dispersed against a vast and undifferentiated snow background. Inspired by the unique view from the cockpit of a fighter flying high over the rugged terrain, the IAF code-named its contribution to the campaign Operation Safed Sagar—Hindi for "white sea."[49]

During the second day of surface attack operations, the IAF lost two fighters in close succession. The first, a MiG-27 from 9 Squadron, experienced an engine failure while coming off a target after its pilot had just conducted a successful two-pass attack with 80mm rockets and 30mm cannon fire on one of the enemy's main supply dumps. The

ensuing in-flight emergency resulted in the pilot ejecting safely after several unsuccessful air-start attempts, only to be captured by the Pakistani intruders almost as soon as he hit the ground.[50] Air Chief Marshal Tipnis later reported that the pilot had fired his rockets well outside the operating envelope stipulated for the weapon, causing the engine to flame out. The sudden loss of power in the thin Himalayan air could have resulted from rocket exhaust gas having been ingested through the engine's air inlets on either side of the aircraft. (The MiG-27 was flying at an altitude well above that at which the rockets had been cleared to be fired.)[51]

The second fighter loss, a MiG-21 from 17 Squadron flying top cover for the strikers, sustained an infrared surface-to-air missile hit while its pilot was flying over the terrain at low level to assist in the search for the downed MiG-27 pilot. The pilot, Squadron Leader Ajay Ahuja, also succeeded in ejecting safely but was executed shortly after he was captured following his landing. His body was subsequently returned bearing fatal bullet wounds and clear signs of brutalization.[52]

FIGURE 2. HIMALAYAN BATTLEFIELD AND AIR TARGETS IN THE KARGIL WAR



Source: *Air Power Journal*
Used with permission.

On the third day of air operations, an IAF Mi-17 helicopter was downed, again by an enemy shoulder-fired Stinger surface-to-air missile while conducting a low-level attack. The ill-fated helicopter had been the last in a four-ship flight of armed Mi-17s flying in trail formation and was the only aircraft in the flight that had not been configured with a self-protection flare dispenser to draw away any incoming heat-seeking missiles.[53]

> The stark backdrop of rocks and snow made for uncommonly difficult visual target acquisition, complicated further by the small size of the enemy troop positions dispersed against a vast and undifferentiated snow background.

The IAF's pilots quickly understood what the Israelis had learned at great cost during the Yom Kippur War of 1973, when Egyptian and Syrian surface-to-air missiles and antiaircraft artillery downed nearly a third of the Israeli Air Force's fighter inventory (102 aircraft) before the three-week war finally ended in victory for Israel.[54] Demonstrating its adaptability, the IAF moved with dispatch to equip all of its participating fighters with flares in order to provide an active countermeasure against any enemy infrared-guided missiles.[55] It also called a halt once and for all to any further use of slow-moving and vulnerable Mi-17 helicopters in an armed fire-support role and directed that all target attacks by IAF fighters be conducted from outside the lethal threat envelopes of enemy shoulder-fired surface-to-air missiles. In all, enemy forces fired more than 100 surface-to-air missiles at IAF aircraft throughout the conflict. After the service's first three days of combat operations, however, not a single one of its aircraft was downed or sustained battle damage.[56]

Throughout the campaign, whenever IAF reconnaissance or ground attack operations were under way in the immediate combat zone, Western Air Command ensured that MiG-29s or other air-to-air fighters were also airborne on combat air patrol stations over the ground fighting on India's side of the LoC to provide top cover against any attempt by the Pakistan Air Force (PAF) to enter the fray in a ground attack role. PAF F-16s to the west typically maintained a safe distance of 10 to 20 miles on the Pakistani side of the LoC, although they occasionally approached as close as 8 miles away from the ongoing ground engagements. The PAF's director of operations during the Kargil War later reported that there had been isolated instances of IAF and PAF fighters locking on to each other with their onboard fire control radars, but that caution had prevailed on both sides and that "no close [air-to-air] encounters took place."[57] IAF fighters never joined in aerial combat with the PAF F-16s due to the Vajpayee government's strict injunction that Indian forces not cross the LoC.[58] Seven years later, however, Air Chief Marshal Tipnis recalled that he had personally authorized his escorting fighter pilots to chase any Pakistani aircraft back across the LoC in hot pursuit were those pilots to be engaged by enemy fighters in aerial combat.[59]

In all, the IAF flew some 460 fighter sorties throughout the campaign dedicated exclusively to maintaining battlespace air defense.[60] These medium- and high-altitude defensive combat air patrols and offensive fighter sweeps, typically entailing four-ship flights of MiG-29s, took place not only in the immediate area of ground fighting in the Kargil sector but throughout Western Air Command's area of responsibility. As Operation Vijay's air component commander later recalled, he was not just concerned about Kargil or the Kashmir region but had a potentially larger-scale war in mind: "I was working on a much bigger canvas.… I was fully conscious that as we hit and killed enemy soldiers, there was every possibility for escalation, possibly outside the immediate combat area, and it was my job to be ready with adequate remaining resources for that eventuality."[61]

IAF strike aircraft operated primarily from three northern bases, Air Force Stations Srinagar, Avantipur, and Udhampur. The closest of those to the fighting, Srinagar, was more than 70 miles away from the war zone. Within just days after the full extent of the Pakistani incursion was confirmed and well before the formal start of Operation Safed Sagar, the MiG-21bis squadron permanently stationed at Srinagar was joined by additional MiG-21M, MiG-23BN, and MiG-27ML squadrons, while additional squadrons of MiG-21Ms and MiG-29s deployed northward to Avantipur.

A MiG-21M at Air Force Station Srinagar during ongoing operations against the NLI, with its squadron commander standing at ease on the flight line in front of it.

By the time Operation Safed Sagar had reached its full stride, the IAF had deployed some 60 of its frontline aircraft to support the war effort, making for about a quarter of Western Air Command's combined fighter inventory.[62] As they awaited mission tasking, those squadrons committed to the campaign initiated special training aimed at better acclimating their pilots to conducting night attacks under moonlit conditions. Such combat operations by fighters over high mountainous terrain at night had never before been attempted in the IAF's history.[63]

Because of their rudimentary bomb sights, the inaccuracy of their unguided weapons, and the ruling against crossing the Line of Control, MiG-21, MiG-23, and MiG-27 pilots typically achieved only limited effectiveness when attempting to provide close air support against enemy point targets.

Increasingly as the joint campaign unfolded, most Indian Army operations were preceded by preparatory air strikes, each of which was closely coordinated beforehand between 15 Corps planners and the AOC for Jammu and Kashmir.[64] Because of their rudimentary bomb sights, the inaccuracy of their unguided weapons, and the ruling against crossing the LoC, MiG-21, MiG-23, and MiG-27 pilots typically achieved only limited effectiveness when attempting to provide close air support against enemy point targets.

Rapidly adapting to these constraints, on May 30, just four days after the start of Operation Safed Sagar, Air Chief Marshal Tipnis decided to take action to help correct the problem of inaccuracy. He chose to commit IAF Mirage 2000H fighters capable of delivering laser-guided bombs to ground attack operations in the Kargil sector. The fighters first had to be configured to deliver the bombs, so Air Headquarters launched an accelerated effort to do so at Air Force Station Gwalior, where the Mirage 2000Hs were principally based.

A MiG-27 from 9 Squadron operating nearest the war zone out of Air Force Station Srinagar. The aircraft is configured with a pod of 57mm rockets under its left wing root, and ground technicians are arming it with a 1,000-lb general-purpose bomb.

India's Aircraft System Testing Establishment (ASTE) in Bangalore was well along in a developmental program to integrate Israeli-made Litening electro-optical targeting pods onto the Mirage 2000H and Jaguar fighters. To support the accelerated effort at Gwalior, ASTE began a full-court press to prepare selected Mirage 2000Hs from 7 Squadron to be fitted with Litening pods for use over Kargil. At the same time, ASTE helped modify the Mirage 2000H's centerline weapons station to carry 1,000-pound U.S.-made Paveway II laser-guided bombs instead of the IAF's French-produced Matra precision munitions, which were prohibitively expensive. Concurrently, the IAF's elite Tactics and Air Combat Development Establishment located at Air Force Station Jamnagar took the lead in developing and validating best tactics, techniques, and procedures for delivering the Paveway II.[65] By June 12, the upgraded Mirage 2000Hs were ready to commence precision strike operations in anger for the first time in IAF history.

In the meantime, air operations against identified intruder positions and support facilities continued in the Jubar and Mashkoh Valley sectors between May 28 and June 1. Throughout the first week of June, inclement weather hindered such operations and persisted to a point where a cloud deck below the ridgelines precluded air attacks entirely on June 10 and 11. Fortunately, 15 Corps had no urgent target servicing requirements for the IAF during those two days.[66]

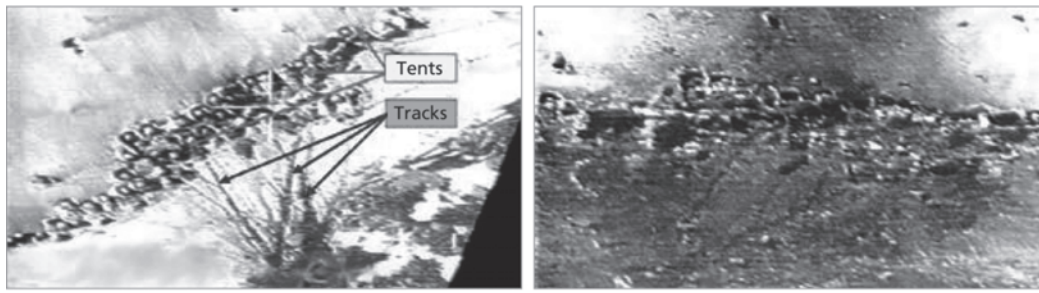
A SUCCESSFUL ENDGAME FOR INDIA

By the time Operation Vijay had reached full momentum in early June, the Indian Army had marshaled nearly a corps' worth of dedicated troop strength in the Kargil area, including the Third and Eighth Mountain Divisions and a substantial number of supporting artillery units. The overriding objective of those forces was to recapture the high ground from which the intruders had a direct line of sight to highway NH-1A, allowing them to lay down sustained artillery fire on it and on adjacent targets. Toward that end, after more than a week of hard fighting, units of Eighth Mountain Division recaptured the strategically important Tololing ridge complex and the adjacent Point 5203 in the Batalik sector on June 13, in what one informed account later described as "probably the turning point" in India's land counteroffensive.[67]

Four days later, on June 17, another important breakthrough in the joint campaign was achieved when a formation of 7 Squadron Mirage 2000Hs struck and destroyed the

enemy's main administrative and logistics encampment at Muntho Dhalo in the Batalik sector by means of accurately placed 1,000-pound general-purpose bombs delivered in high-angle dive attacks using the aircraft's computer-assisted weapons-aiming capability. For this pivotal attack, the IAF waited until the encampment had grown to a size that rendered it strategically ripe for such targeting. The AOC-in-C of Western Air Command at the time, Air Marshal Patney, affirmed later that the essentially total destruction by the IAF of the NLI's rudimentary but absolutely life-sustaining infrastructure at Muntho Dhalo "paralyzed the enemy war effort, as it was their major supply depot."[68] In characterizing the attack as "perhaps the most spectacular of all the [campaign's air] strikes," a serving IAF air commodore reported at the end of 1999 that it resulted in as many as 300 enemy casualties within just minutes.[69] Figure 3 shows pre- and post-strike aerial imagery of the enemy camp at Muntho Dhalo. In the first image, a dense array of tents and structures, as well as tracks leading up the hillside from the encampment, are clearly visible. In the second, after completion of the IAF's attacks, all that remain are bomb craters and rubble.

FIGURE 3. PRE- AND POST-STRIKE IMAGERY OF THE NORTHERN LIGHT INFANTRY DEPOT AT MUNTHO DHALO



Source: Indian Air Force
Used with permission.

A week later, on June 24, a two-ship element of Mirage 2000Hs, in the first-ever combat use of laser-guided bombs by the IAF, struck and destroyed the NLI's command and control bunkers on Tiger Hill, the direction center for the forward-based artillery that had been fired against the Indian Army's brigade headquarters at Dras. They used two 1,000-pound Paveway II laser-guided munitions, with other fighters striking additional targets with unguided bombs.[70] In these attacks, the target was acquired through the Litening pod's electro-optical imaging sensor at about 12 miles out, with weapon release occurring at a slant range of about 5 miles and the aircraft then turning away while continuing to mark the target with a laser spot for the weapon to guide on.[71]

The following day, Mirage 2000Hs and Jaguars initiated around-the-clock bombing of enemy positions throughout the Batalik and Dras subsectors. Mirage 2000Hs struck as many as 25 separate designated aim points toward the campaign's end, including at Muntho Dhalo and the equally important Point 4388 overlooking Dras.[72]

The air support provided by the IAF almost instantly boosted the morale of India's beleaguered ground troops and facilitated an early recapture of their outposts at Muntho Dhalo and Tiger Hill.

The air support provided by the IAF almost instantly boosted the morale of India's beleaguered ground troops and facilitated an early recapture of their outposts at Muntho Dhalo and Tiger Hill. After an exhausting struggle, Tiger Hill was retaken on July 4, and by July 8, 15 Corps reported that its units had recaptured 99 percent of the Batalik-Yaldor subsector and 90 percent of the Dras area, leading Prime Minister Vajpayee to declare that "there is going to be a great victory."[73] The next day, the IAF received this congratulatory message from the Indian Army's field headquarters:

> You guys have done a wonderful job. Your Mirage boys with their precision laser-guided bombs targeted an enemy battalion headquarters in Tiger Hill with tremendous success.… The enemy is on the run. They are on the run in other sectors also. At this rate, the end of the conflict may come soon.[74]

Other than for an inconsequential brief delay due to weather, IAF combat operations continued without interruption for seven weeks. At the height of Operation Safed Sagar, the IAF was generating more than 40 fixed-wing combat sorties a day in both direct and indirect support to 15 Corps. Western Air Command was not the sole provider of IAF assets to conduct these daily missions. Because of its depth with respect to India's western border, the service's Central Air Command headquartered at Allahabad in Uttar Pradesh has traditionally been the repository of such major IAF strategic assets as the since-retired Mach 3–capable MiG-25R high-altitude reconnaissance aircraft and the Mirage 2000Hs. It was under Central Air Command's aegis that the MiG-25R was pressed into a unique medium-altitude tactical reconnaissance role to meet the needs of Operation Safed Sagar. The Mirage 2000Hs of the IAF's 7 Squadron were also Central Air Command's assets and were seconded to the operational control of Western Air Command for their use in the Kargil fighting. There was reluctance at first to employ the Mirage 2000Hs, as some in the IAF's leadership wanted to save the fighters in case the conflict escalated. For that reason, the aircraft were never fully committed to the fight. If they had been, according to the parent command's AOC-in-C at the time, they might have yielded "even better results than those achieved in Operation Safed Sagar."[75]

Aerial strike operations ended on July 12. In all, IAF fighters flew more than 1,700 strike, combat air patrol and escort, and reconnaissance sorties throughout the campaign's course, including around 40 at night during the final weeks of fighting.

TABLE 1. IAF COMBAT AND COMBAT SUPPORT SORTIES FLOWN BY AIRCRAFT TYPE

Type	Number of Sorties	Effort (%)
Fighters	1,730	22.7
Helicopters	2,474	32.4
Transports	3,427	44.9
Total	7,631	100

Source: Indian Ministry of Defence
Used with permission.

Table 1 presents a breakdown of the total numbers of IAF sorties flown throughout the campaign by aircraft type. Although the IAF's Mi-17 helicopters were not used in an armed role after one was lost to an enemy surface-to-air missile during the air offensive's third day, they continued to play a vital part throughout the remainder of the campaign in conducting airlift, casualty evacuation, and reconnaissance missions.[76]

An Mi-17 departing Dras on a resupply mission in support of Indian Army troops working the steep slopes in their effort to retake Tiger Hill, seen directly ahead in the helicopter's direction of flight.

At long last, "yard by bloody yard," as a retired Indian Army general later described the effort, the Kargil ridgelines were recaptured from the intruders through a heroic Indian infantry counteroffensive facilitated from its first days onward by supporting IAF airpower.[77] By July 26, Indian forces had reclaimed a majority of their seized outposts above Kargil and driven the enemy troops that had occupied them back to their own side of the LoC, with all remaining Pakistani forces subsequently vacating the still-occupied positions under the weight of diplomatic pressure from the United States. In the end, by its official after-action count, the Indian Army suffered 471 troops killed in action and 1,060 soldiers wounded during the Kargil fighting. For their part, the occupying Pakistani forces were said by Indian sources to have lost more than 700 troops killed in action with around a thousand more wounded, although much disagreement and uncertainty still surround the latter figures.[78]

DIFFICULTIES AFFECTING THE PROVISION OF CLOSE AIR SUPPORT

Just three weeks before the commencement of Operation Safed Sagar, Western Air Command had concluded a three-week-long annual exercise during which it had flown some 5,000 training sorties involving upward of 300 aircraft that included simulated attacks against targets in the Himalayas.[79] Nevertheless, the IAF experienced a slow start in the Kargil campaign and rode a steep learning curve at first as its pilots and planners gradually adapted to unfamiliar operating conditions and steadily improved their performance over time. As a former IAF air marshal frankly conceded on this score, the service "took some time before honing the [needed] skills and becoming effective" in a high mountain combat setting that no air force had ever experienced before.[80] Until that happened, the PAF's director of operations during the Kargil crisis was on firm ground in remarking retrospectively that "the results achieved by the

The IAF experienced a slow start in the Kargil campaign and rode a steep learning curve at first as its pilots and planners gradually adapted to unfamiliar operating conditions and steadily improved their performance over time.

IAF in the first two days were dismal."[81] In a similar vein, some Indian Army field commanders later complained that for the campaign's first three weeks, the effectiveness of the IAF's effort to provide close air support for their troops was "near negligible."[82]

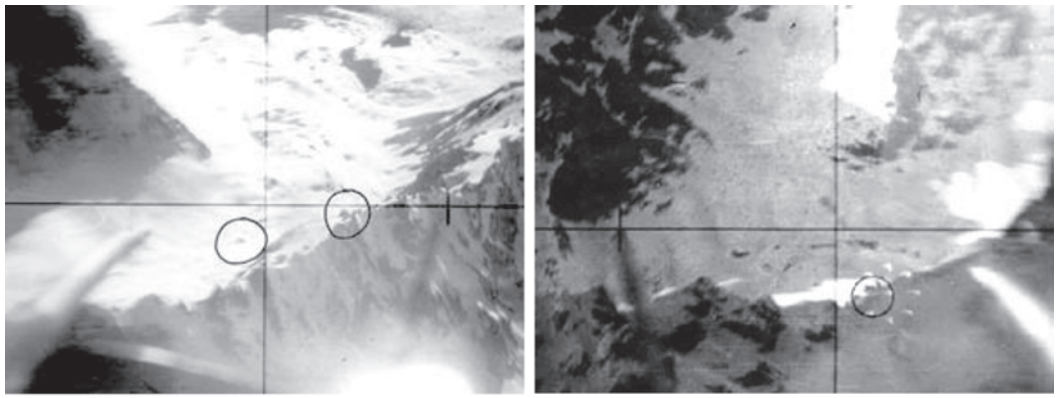
There are two compelling reasons why the attempted delivery of effective close air support was so problematic for the IAF throughout most of the Kargil fighting. First, the enemy targets that presented themselves in the Kargil heights were nothing like the more conventional target array that fighter aircraft typically engage when providing support to ground combat operations. As one IAF airman later pointed out, the target complex did not consist of troop concentrations, command posts, and logistical supply lines, but rather "near-invisible humans well dug into hideouts … on various hilltops and slopes," where "only their tents and earthwork structures were identifiable" from the air when not masked by the natural camouflage that was provided by "the ubiquitous black and white color combination of the terrain." By this account, the largest target struck by the IAF during Operation Safed Sagar, the enemy's supply camp at Muntho Dhalo, "would normally have been the smallest target considered for the use of airpower during a normal all-out war."[83]

To make matters worse, the IAF, which was well familiar with the use of forward air controllers in support of friendly troops in close contact with enemy forces, was unable to employ ground-based terminal attack controllers for its close air support missions during the Kargil counteroffensive. Such use was precluded because the enemy's shooter positions were generally remote, most close air support–related targets were small and either naturally or artificially camouflaged, and the required minimum safe distance from the target ruled out a clear view of the target from the ground and any practical way of designating it accurately.[84] Figure 4, which depicts two typical enemy target arrays situated along high Himalayan ridgelines, well captures the IAF's visual target acquisition problem throughout the Kargil War.

Second, IAF operations were hampered from the very start by multiple constraints on their freedom of action. To begin with, because of their high gross weight when fully fueled and armed, the IAF's heavy Mi-25 and Mi-35 Hind attack helicopters were unable to operate at the high mountain elevations where most of the fighting took place. Accordingly, they were not used at any time during the Kargil campaign. In addition, prohibited from crossing the LoC, fast-moving fighters were driven to employ target attack tactics using ingress and egress headings that were not optimal or, in many instances, even safe.

By way of example, in the case of a fighter aircraft flying inside a mountain valley with high ridgelines on either side, a turn into a wrong valley that ends up being a box canyon can result in disaster for the pilot if he has insufficient lateral maneuvering room or available power to clear vertical obstructions. Likewise, successfully servicing targets situated on steep mountain slopes requires cross-valley attacks in which the establishment of a direct line of sight between the attacking aircraft and the target occurs late in the

FIGURE 4. PAKISTANI POSITIONS AS VIEWED FROM AN INDIAN FIGHTER COCKPIT



Source: Indian Air Force
Used with permission.

pilot's setup for weapon release because of intervening ridgelines. When one adds to such complicating factors an unusually small target size, the result all too often is a delayed or failed visual target acquisition or, depending on the terrain layout, an abnormally steep dive angle for weapon delivery. Since altitude loss during dive recoveries is substantially greater at high mountain elevations than during strike operations conducted closer to sea level, such abnormal dive angles allow little target tracking time before a recovery from the dive must be initiated. All of these complicating factors invariably make errors more likely in weapon release and placement.

With respect to the harmful impact of the politically imposed LoC constraint on the IAF's tactical flexibility, India's minister for external affairs during the Kargil War later recalled in his memoirs: "There were but two routes for the air force to operate on, and both were extremely narrow funnels. Our missions could fly in this narrow corridor either west or east or reverse." He further recalled: "The fact of the LoC not being a visibly marked line on the ground compounded difficulties."[85] Relatedly, because the decree prevented the IAF from operating on the Pakistani side of the LoC, the conduct of Operation Vijay remained limited to the immediate terrain from which the Indian Army sought to evict the intruders, while the most lucrative targets associated with providing logistical sustenance to the intruders enjoyed an inviolate sanctuary in Pakistani-occupied Kashmir. In particular, the town of Skardu on the Pakistani side of the LoC was only 108 miles from Kargil and had all the needed facilities for providing logistical and artillery support to the Pakistani intruders. Had the IAF been permitted to cross the LoC, it could have spared the Indian Army the need for its costly frontal assault against the Pakistanis by leveraging its asymmetric advantage to attack their source of resupply in Pakistani-occupied Kashmir, in effect

imposing an aerial blockade. That, however, would have risked escalation to a wider war, perhaps one involving the PAF, which the Vajpayee government was determined to prevent at every cost.

Moreover, the man-portable surface-to-air missiles that the intruders wielded had an effective slant range that was sufficient to require the IAF's fighter pilots to remain 6,000 to 8,000 feet above the high ridgelines at all times in order to stay safely outside their threat envelopes, which increased the aircraft's turn radius, rendering some targets unserviceable from the air because of the prohibition against any crossing of the LoC. On top of that, when bombs were dropped, their delivery accuracy was degraded at higher release altitudes. Because of the extreme elevation at which most of the fighting took place, the IAF's munitions did not perform aerodynamically to their familiar specifications for lower release altitudes. The reduced air temperature and density above the Kargil heights altered drag indices and other performance parameters that had never before been calculated for those conditions, causing weapons not to guide as predicted and requiring adaptation of delivery techniques through real-time improvisation.[86] More to the point, as a result of the reduced aerodynamic drag caused by the surrounding thin air at higher altitudes, unguided munitions tended to overshoot their intended aim points. Precision munitions tended to have greater trajectory inertia, which translated into an increase in the weapon's normal circular error probable.

The man-portable surface-to-air missiles that the intruders wielded had an effective slant range that was sufficient to require the IAF's fighter pilots to remain 6,000 to 8,000 feet above the high ridgelines at all times in order to stay safely outside their threat envelopes, rendering some targets unserviceable from the air.

In addition, as noted above, the thinner air required pilots to release their weapons and initiate a pullout sooner than they normally would in airspace closer to sea level, further degrading delivery accuracy. On a number of occasions, Indian ground units were alleged by some to have aborted close air support attacks in progress at the last minute out of concern that a fratricide incident might occur as a result of the inaccuracy of the IAF's unguided bombs.[87] In fact, the only reason that any close air support missions in progress were aborted (all were preplanned and coordinated in advance with 15 Corps) had to do either with intervening weather at the last minute or with friendly ground units that had not yet removed themselves from dangerously close proximity to enemy forces.[88] The IAF's appreciation of this legitimate concern over the ever-present danger of fratricide and its unerring air discipline were such that, in the words of the

AOC-in-C of Western Air Command at the time, "there was no case [throughout the campaign] of a blue-on-blue kill in spite of possibly high inaccuracies in the hills."[89]

Complicating matters further, the Pakistanis' individual troop positions were small and generally well-concealed, making them often so resistant to visual acquisition and targeting that the IAF's pilots, according to one analysis of the campaign, "did not provide reliable and consistent close support" to 15 Corps's engaged units. Stark terrain folds in the Himalayas tended to obscure the enemy from aerial observation and to mask the effects of bomb detonations, rendering even near misses ineffective. They also served to canalize aerial approaches to targets, dictating aircraft ingress and egress headings and, in the process, making IAF fighters predictable and hence more susceptible to ground fire.[90]

Stark terrain folds in the Himalayas tended to obscure the enemy from aerial observation and to mask the effects of bomb detonations, rendering even near misses ineffective.

ASSESSING THE IAF'S PERFORMANCE

Both the Indian Army and the IAF were essential players in a genuinely joint counteroffensive. It would be hard to deem either as having been the more pivotal contributor toward determining the ultimate victory for India's forces.[91] To be sure, from a simple weight-of-effort perspective, 15 Corps artillery was the main source of direct fire support throughout the fighting, and massive barrages of it provided sustained suppressive cover under which Indian infantry teams eventually moved up the daunting terrain to recapture their former posts. In all, 15 Corps committed 15 artillery regiments and more than 300 artillery pieces to what one account called "one of the most bitterly fought mountain battles of all times."[92] Throughout the campaign, they expended more than 250,000 rounds of ammunition in a sustained laydown of fire on a scale not seen anywhere in the world since World War II.

But to say that the IAF turned in a "poor showing" during the Kargil War, as one otherwise insightful campaign assessment observed two years after the conflict ended, overstates the cumulative impact of the IAF's operational shortcomings by a considerable

margin.[93] On the contrary, as a better-informed review of Operation Vijay concluded some time thereafter, the IAF's entry into action on May 26 and its gradual improvement in performance over time in fact "represented a paradigm shift in the nature and prognosis of the conflict."[94]

Granted, it was only natural that India's leading airmen would lend their voices to such a self-congratulatory conclusion. For example, a decade after the war ended, the chief of the Air Staff at the time, Air Chief Marshal Fali Homi Major, suggested that the IAF's entry into the Kargil equation had "immediately altered the nature of the conflict."[95] By the same token, during his tenure as the AOC-in-C of Western Air Command, Air Marshal Pranab Barbora volunteered at roughly the same time that "the conflict in Kargil would have gone on and on if airpower … had not come into play."[96] In strong supporting testimony to these observations, the Indian government's formal after-action assessment of the campaign released on December 15, 1999, found the intervention of the IAF to have been both "unnerving" to the enemy and

> a significant development with far-reaching consequences.… Not only did this decision send a signal to Pakistan that India would use all available means to evict the intruders, it also had a strong impact on the course of the tactical battle in terms of the interdiction of Pakistani supply lines within Indian territory … and the lowering of the morale of the intruders.[97]

It was not, however, just Indian Air Force leaders who rendered such laudatory judgments regarding their service's performance. Senior Indian Army officers were likewise generous in voicing their appreciation of the IAF's combat contributions. For example, retired Major General G. D. Bakshi characterized the IAF's innovative use of airpower as "one of the excellent features of the Kargil operations," adding that "the complete domination of the sky by the IAF over the area of intrusion … served to demoralize the [NLI] troopers" and, "in combination with artillery, served to mass effects and generate an element of shock and awe."[98]

If the IAF was unable to provide consistently effective on-call close air support for all the prevailing multitude of extenuating factors, it certainly was effective in other air applications no less pertinent to the ongoing fighting. The IAF performed more than adequately in servicing enemy headquarters complexes, supply dumps, and other assets that were more readily accessible to aerial attack from standoff ranges.[99] As a U.S. Army officer rightly observed in this regard, the IAF's contribution to the joint fight "grew as the campaign wore on," and fighter aircraft armed with laser-guided bombs and well-placed unguided munitions "eventually destroyed virtually all of the Pakistani supply lines and played a major role in the battle for Tiger Hill."[100] Furthermore, in marked contrast to what the air component commander during the Kargil fighting later characterized as 15 Corps's "profligacy in the use of artillery in a carpet-bombing mode," the IAF dropped

only around 500 general-purpose bombs in all during the seventy-four-day campaign, none of which were released indiscriminately and the majority of which were deemed to have been effective against their assigned targets. As Air Marshal Patney recalled in this regard, "after every mission, the army would give us the results of the attack. In about 70 percent of the missions, we were told 'bombs on target.'"[101]

The IAF also rapidly adapted to the campaign's unique operational challenges. The PAF's director of operations during the war was one of many who acknowledged afterward how the IAF "immediately went into a reappraisal mode [after its initial combat losses] and came out with GPS [Global Positioning System]-assisted high-altitude bombing by the MiG-21, MiG-23BN, and MiG-27 as a makeshift solution." He further acknowledged the rapid reconfiguration of the Mirage 2000H with Litening pods to allow the option of day and night laser-guided bomb delivery. Once accurate target attacks by Mirage 2000Hs and Jaguars showed their ability to achieve significant combat effects, he added, around-the-clock operations by the IAF "had made retention of posts untenable by the Pakistani infiltrators." In all, he concluded, although the Indian high command was completely surprised by the Kargil intrusion at the outset, "the IAF mobilized and reacted rapidly as the Indian Army took time to position itself."[102]

Much of the IAF's improved combat effectiveness during the campaign over time was a direct result of Western Air Command's eventual replacement of classic manual dive bombing by MiG-23s and MiG-27s with the more accurate method of GPS-aided level bombing from safer altitudes above the effective reach of the enemy's man-portable infrared surface-to-air missiles. As the command's AOC-in-C at the time later recalled, "when the conflict started, there was only one squadron fitted with GPS. We [accordingly] acquired hand-held GPS instruments from the market and fitted them in the aircraft," which allowed for "a somewhat ad hoc system.… With the target coordinates available, on approach to the target, pilots dropped their bombs at the determined distance from the target. We knew that if the coordinates were accurate, the results would be reasonable." Air Marshal Patney added: "We also knew that the accuracy would be much better at lower heights. That is why we resorted to night operations in those forbidding hills and at low levels of around 500 feet, something never done before anywhere in the world and that also with aircraft that had no modern aids and in an area where no radars could operate."[103] Air Chief Marshal Tipnis later applauded this novel initiative as the air war's "biggest contribution to ingeniousness."[104]

By the same token, once the Mirage 2000H was introduced into the daily flow of operations, the accuracy of IAF weapons deliveries against point targets increased substantially even with the use of unguided low-drag bombs, thanks to the aircraft's much-improved onboard avionics suite that features a continuously computed release point (CCRP) system which compensates for target area wind and enables near-precise weapon placement. The pilot simply designates his intended aim point through his cockpit head-up

display (HUD) and then depresses a consent button on the aircraft's control stick. The computer releases the bomb automatically at just the right moment once all required delivery accuracy parameters are achieved. With the aid of this proven system, the pilot knows with high confidence that his bomb will land on the point designated by the cursor on his HUD once the weapon departs its pylon.

A mission-ready Mirage 2000H assigned to 7 Squadron. The aircraft is configured with an external fuel tank on its centerline station and armed with four 1,000-pound unguided general-purpose bombs on its underwing weapons pylons.

Further innovative real-time adaptation by the IAF occurred when MiG-21 pilots lacking sophisticated onboard navigation suites resorted to the use of stopwatches and GPS receivers in their cockpits for conducting night interdiction bombing.[105] Yet another novel technique developed by the IAF for use in the campaign entailed selecting weapon impact points so as to create landslides and avalanches that covered intruder supply lines.[106] Finally, to note just one of many additional examples that could be cited, the IAF pioneered during its Kargil campaign what has since come to be called nontraditional intelligence, surveillance, and reconnaissance through its use of electro-optical and infrared imaging targeting pods for conducting high-resolution aerial reconnaissance of the battlespace.[107]

It was yet another exaggeration for two commentators, in assessing the campaign, to suggest that the IAF's leaders were "shocked" at their two aircraft losses to surface-to-air missile fire and that those same leaders "panicked" as they searched for alternative tactics, techniques, and procedures for addressing the challenge the missiles presented.[108] In fact, what those leaders actually did in the circumstances was to consider with deliberation a surface-to-air threat that they had fully anticipated in their prior contingency planning and then to address it systematically in a solutions-oriented way. As Air Chief Marshal Tipnis told Prime Minister Vajpayee and others at a Cabinet Committee on Security meeting after the two aircraft were downed, "While I was sorry to lose two fighters, I was

not overly worried. The air force knew what had gone wrong and knew what was required to be done to ensure we did not repeat the mistakes."[109]

In this connection, as the ineffectiveness of the IAF's conventional bombing persisted for four straight days on end, Tipnis visited 15 Corps headquarters in Srinagar to confer with the on-scene army commanders and to jointly work out best alternative approaches to the satisfaction of all.[110] It was in substantial part out of that cross-service mind meld at the tactical level that Tipnis ultimately decided to employ Mirage 2000Hs that could deliver laser-guided bombs with consistent accuracy against the most vital targets.

Partly because the IAF had not amassed a sizable inventory of laser-guided bombs at the time the crisis erupted and partly because of the paucity of targets of sufficient merit to warrant the use of such costly munitions, Western Air Command, by the recollection of its commander at the time, expended only two laser-guided bombs in all throughout the Kargil fighting, both delivered against the enemy's main forward command post on Tiger Hill.[111] Yet even this limited use against a key NLI target dramatically altered the dynamics of the campaign. After those successful laser-guided bomb attacks, subsequent targeting pod imagery observed by IAF pilots in real time showed enemy troops abandoning their positions at the very sound of approaching fighters.[112] Diaries kept by Pakistani soldiers that were later recovered by Indian Army units amply attested to the demoralization caused by the IAF's attacks, most particularly those conducted during the campaign's final countdown once precision munitions were introduced.[113]

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With respect to the altitude floor imposed on IAF fighter operations by Western Air Command throughout most of the campaign out of legitimate concern over the ubiquitous enemy infrared surface-to-air-missile threat, the commander of the Indian Army's Fifty-Sixth Mountain Brigade, Brigadier Amar Aul, later blamed the ineffectiveness of many IAF attempts at close air support delivery on the unwillingness of IAF pilots to "take reasonable risks" by descending into the enemy's lethal antiaircraft threat envelope.[114] To that all-but-express intimation of IAF cowardice in the face of enemy fire, an IAF group captain responded that such unwillingness was driven by the entirely appropriate and sensible need for the IAF to respect the effectiveness of the enemy's infrared surface-to-air missiles. "A far more serious lapse," he observed, would have been "a dogged tendency to persist in sacrificing assets when, clearly, there was a need for a reassessment."[115]

True enough, the hard deck of 6,000 to 8,000 feet above the terrain that was imposed on the IAF's pilots after the downing of two aircraft by enemy surface-to-air missiles during the campaign's second and third days "reduced their ability to deliver effective [close air support] to [ground] maneuver units."[116] But it also eliminated their susceptibility to an all but certain high loss rate had they persisted in attempting such foolhardy operations under the circumstances. On this point, as the above-cited group captain later correctly noted, "gone are the days of fighters screaming in at deck level, acting as a piece of extended artillery. The air defense environment of today's battlefield just does not permit such employment of airpower any more, a significant fact that needs to be understood by soldier and civilian alike."[117]

By remaining safely outside the enemy's lethal surface-to-air-missile threat envelope, the IAF's pilots during the Kargil War were doing exactly what any professional airmen the world over would have done in similar circumstances.

In this regard, it is worth noting in passing that when the legitimate demands of threat avoidance require fighter aircraft to operate so high above a battlefield that engaged ground troops cannot see or hear them, it is only natural for the latter to suspect at some level that their promised "air support" is not there. Yet by remaining safely outside the enemy's lethal surface-to-air-missile threat envelope, the IAF's pilots during the Kargil War were doing exactly what any professional airmen the world over would have done in similar circumstances. Indeed, they did what U.S. and allied pilots have done in all major instances of aerial force employment from Operation Desert Storm in 1991 onward—unless, of course, a truly dire emergency situation on the ground should require accepting higher risk.[118]

It also is true that the IAF's suspension of any further attempts to use armed helicopters in combat and its associated imposition of an altitude floor to keep fixed-wing fighters out of the enemy's surface-to-air-missile threat envelope "removed a large component of potential Indian firepower" from the fight, but *only* from providing effective direct fire support to friendly troops in close contact with enemy forces.[119] Those legitimate and proper operating restrictions in no way kept IAF pilots from providing indirect support and interdiction that had a steadily mounting effect in facilitating Indian ground advances against the enemy over time. As the IAF group captain later recalled in this regard, "the series of [IAF] attacks against Point 4388 in the Dras sector was an excellent example of how lethal air strikes, combined with timely reconnaissance, detected the enemy plans to shift to alternate supply routes, which were once again effectively attacked. In this, the IAF succeeded in strangling the enemy supply arteries."[120]

One important battlefield effect achieved by the IAF's combat air patrol operations during the campaign was their prevention of Pakistani helicopters from resupplying the NLI's outposts and conducting reconnaissance and casualty evacuation missions, an accomplishment that a retired Indian Army major general portrayed as the IAF's "most significant contribution" to Operation Vijay.[121] Another significant IAF contribution was the successful interdiction of needed resupply to the increasingly beleaguered Pakistani intruders by destroying the NLI's logistics base at Muntho Dhalo. By one informed assessment, hundreds of enemy troops were killed by IAF air action in such attacks, and Indian military intelligence intercepted numerous enemy radio transmissions during the campaign that attested to the effectiveness of those attacks.[122] Especially during the campaign's final days, that intercepted traffic revealed severe shortages of rations, water, medical supplies, and ammunition, as well as an inability of the occupying enemy units to evacuate their wounded.[123] Yet another telling testament to the effectiveness of the IAF's interdiction attacks came when Pakistan's Foreign Minister Sartaj Aziz, during an official visit to New Delhi on June 12 as Operation Vijay was just reaching peak intensity, implored the IAF to "stop its air strikes" as one of three specific requests that he levied on the Indian government.[124]

The IAF's ability to adapt to an unnatural limitation imposed by top-down civilian direction and to work effectively within the Vajpayee government's ban against any crossing of the Line of Control by Indian forces may well have been the determining factor in keeping the PAF out of the fighting and hence in maintaining escalation control throughout the seventy-four-day war.

The IAF's ability to adapt to an unnatural limitation imposed by top-down civilian direction and to work effectively within the Vajpayee government's ban against any crossing of the LoC by Indian forces may well have been the determining factor in keeping the PAF out of the fighting and hence in maintaining escalation control throughout the seventy-four-day war. After the surviving intruders were driven back into Pakistani-controlled territory and the Indian Army reclaimed and secured its positions in the Kargil heights, Air Marshal Patney reflected in this regard:

> It is the nature of airpower that escalation is inherent in its use, unless its use is one-sided, as happened this time.… Before May 26, when we went into action, one of our apprehensions … was the degree of enemy resolve and to what extent we could expect such escalation.

Patney added:

> We had not planned for this kind of war. We had planned that we would use airpower in this particular area, but certainly not in the way we were required to do so.… If we were to apply airpower in its classical sense, in which we had done all our training, we would have crossed the LoC well before and crossed the [international border] as well.[125]

In the end, however, neither development ever occurred.[126]

The asymmetrical use of India's airpower allowed the Vajpayee government to telegraph an unmistakable signal of its seriousness to key audiences both in Pakistan and worldwide. Further, as one of the best Western accounts of the Kargil fighting from an operational perspective observed, it "had the additional domestic benefit of giving the IAF a direct role in a major national crisis, not unimportant for future bureaucratic struggles."[127]

NATIONAL SECURITY LESSONS

The Kargil War of 1999 was a rich teaching experience for India in the national security arena in many respects. For one thing, it represented the country's first exposure to the "CNN factor," in that televised images of the fighting showcased in Indian living rooms each evening helped the government and armed forces to mobilize domestic support for Operation Vijay while, at the same time, demoralizing the literate Pakistani rank and file. Making the most of that tool, the Vajpayee government interacted skillfully with the nation's media in building domestic and international appreciation of the fact that India had been attacked without provocation by Pakistan and accordingly was in the right in its chosen response.

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As the counteroffensive unfolded, Indian media coverage of combat events was detailed and extensive, with numerous television channels showing a constant flow of scenes from the war zone in a manner reminiscent of

CNN's coverage of the 1991 Persian Gulf War. Some analysts in New Delhi suggested afterward that this media coverage helped to serve as a force multiplier for Indian combat operations, since it was more credible by far than Pakistan's version of ongoing events. It definitely served as a morale booster for the Indian populace. Shortly after the campaign ended, the Indian government convened a Kargil Review Committee, chaired by the eminent international security scholar and strategist K. Subrahmanyam, which was charged with determining how Pakistan's forces had succeeded in crossing into Indian-controlled territory and establishing a foothold there without having been detected in due time by military intelligence.[128] It concluded on the important media-coverage count that the showdown against the Pakistani intruders was "India's first television war" and, as such, was an experience that "knit the country together as never before."[129]

A major shortcoming highlighted by the war experience was a significant deficiency with respect to the provision of timely indications and warning of impending crises.

As for the country's vigilance over its perennially volatile border with Pakistan, a major shortcoming highlighted by the war experience was a significant deficiency with respect to the provision of timely indications and warning of impending crises. Although the Indian Army had a brigade of troops fielded in the Kargil sector to monitor activities there and the IAF possessed Canberras, Jaguars, and MiG-25Rs capable of overseeing the area by means of medium- and high-altitude aerial photography, local civilians noticed the intruders before the Indian Air Force did. In an early comment on the air contribution to the campaign, a serving IAF air commodore frankly admitted that Pakistan's intrusion into the high reaches of the Kargil sector made for "a surprise bordering on shock."[130] A clear lesson emanating from this experience, he noted, was the "urgent requirement to improve our surveillance and reconnaissance capability. We cannot afford to be surprised again."[131] Similarly, the Indian Army chief at the time, General Malik, later recalled that India's surprise at the incursion "reflected a major deficiency in [the country's] system of collecting, reporting, and assessing intelligence."[132] Clearly, the IAF needed a better nationwide, real-time intelligence, surveillance, and reconnaissance capability.

As for the good-news part of the story, this intelligence, surveillance, and reconnaissance deficiency has since been substantially improved upon by India's placement of indigenous reconnaissance satellites on orbit. In October 2001, the Indian government launched its first Technology Experiment Satellite, which substantially improved the quality of its overhead intelligence product as a result of the satellite's one-meter resolution.[133] India's spaceborne synthetic aperture radar capability provides all-weather, around-the-clock coverage, and the Indian Army also now maintains a constant vigil in the area with its inventory of Israeli-made Searcher and Heron unmanned aerial vehicles.

In addition, today there are five times the number of troops permanently garrisoned in the Kargil sector than at the time of the Pakistani incursion in 1999, consisting of four brigades totaling nearly 20,000 troops.[134]

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A major interservice shortcoming highlighted by the first two weeks that followed the initial detection of the incursion was the near-total lack of transparency and open communication between the Indian Army and the IAF with respect to the gathering crisis. Without question, the onset of the Kargil confrontation revealed a lack of effective air-ground integration in India's joint arena at the most senior leadership level. On this point, one IAF airman later lamented the "complete loss of synergy between air and land forces" at the start of the operation that had been occasioned by "the late induction into the fray of airpower and, hence, the denial of the optimum employment of its attributes of offensive action," notwithstanding the fact that "we were fighting a clearly defined enemy within our own territory."[135] Another IAF airman, noting how the army at the outset had "looked to fight a classical high-altitude battle on its own," asked rhetorically whether it was, at least during the campaign's first two weeks, a case of "my war, can you help" rather than "our war, let's do it together."[136]

This inclination at the outset to go it alone, it might be noted, was not just an idiosyncratic Indian Army trait. The since-retired director of operations of the PAF during the Kargil crisis, Air Commodore Kaiser Tufail, similarly noted the PAF leadership's "surprise" at having been told of what the Pakistan Army leaders had authorized, adding that "we all were … piqued at being left out of the army's planning [and] were given to believe that this was a 'limited tactical action' in which the PAF would not be required." Tufail also noted that from the very start of the Kargil confrontation, the PAF "was trapped by a circumstantial absurdity—it was faced with the ludicrous predicament of having to provide air support to infiltrators already disowned by the Pakistani Army leadership." He further suggested that in the end, the PAF's "restraint in warding off a major conflagration" was "its paramount contribution to the Kargil conflict."[137]

In their clear inclination at first to go it alone in countering Pakistan's incursion into Indian-controlled Kashmir, the Indian Army's leaders failed to honor the reasonable proposition advanced four years earlier in the IAF's first published air doctrine that "wars are rarely won … by a single component of military force." The IAF's doctrine manual issued in 1995 had noted "the immense advantages air forces can provide *before* a surface battle begins and the major contribution air forces can make in exploiting opportunities as a result of surface action."[138] As for the opportunity costs incurred by the Indian Army

as a result of that initial failure, one was an unfortunate persistence of misunderstandings regarding the IAF's capabilities and limitations that could easily have been cleared up in ample time beforehand by more open and timely cross-service communication.[139]

For example, of the army's insistence at the outset that the IAF employ solely attack helicopters in the close air support role, an IAF airman later wrote that

> a sounder understanding of airpower capabilities [on the army leadership's part] would have dictated that the most vulnerable platforms be inducted last. Had the Indian Army taken the IAF into confidence from Day One and developed a joint plan to evict the intruders instead of trying to use it as an afterthought, armed helicopters could have joined the fight after sufficient degradation had been inflicted by fixed-wing aircraft and artillery.[140]

As for the complaints heard later from some army commentators that the IAF's pilots would not descend to lower altitudes from which their free-fall munitions could be delivered with greater accuracy, another IAF airman observed that "one of the valuable lessons that emerged from the Kargil operations was the need for closer joint army–air force planning and consultations from the very beginning," whereby the targeting advice of Indian airmen "could, at the very outset, be incorporated into the army's plan for ground operations." This airman also explained why scarce air assets should not be "frittered away on insignificant targets like machine-gun posts and trenches, but [rather should be used] on large targets of consequence," such as the enemy supply camp at Muntho Dhalo and the enemy battalion headquarters atop Tiger Hill, against which it could be more effective in meeting the army's support needs at the operational and strategic levels.[141]

After the Kargil Review Committee's report was released, the Indian Army censured the responsible division commander and relieved the brigade commander—the latter of whom since won a lawsuit in which he successfully argued that his dismissal had been without valid cause.[142] No effort was undertaken beyond that, however, to allocate responsibility for the breakdown in jointness at the service leadership level and for the army's slowness to enlist the IAF's full involvement once an imminent clash was at hand.

A decade later, the former AOC for Jammu and Kashmir who had overseen IAF operations at the tactical level during the campaign wrote that one of the most important lessons spotlighted by the experience was the crucial need for "integration of higher military management and mission-based capability creation. That has not yet happened." He added that the IAF and Indian Army today are definitely creating communication networks with cross-service interfaces to plug into one another's network but noted further that "whether these will work in a network-centric environment remains unknown."[143] He also observed that the Kargil Review Committee's recommendations had still not yet been fully implemented "due to [persistent] differences between the army, navy and air force and the unwillingness of the political class to enact the binding legislation."[144]

On the plus side, once the army got past its initial disagreements with the IAF over precisely what kind of air support it needed and just how that support might best be provided, an atmosphere of harmony largely prevailed between the two services when it came time to move ahead with the implementation of Operation Vijay. In this respect, General Malik later recalled that once the scale and potential consequences of the intrusion had become fully understood and assimilated by the service chiefs, he went out of his way to persuade the Cabinet Committee on Security that India's substantial air and naval supremacy should be brought to bear not only in the immediate Kargil sector but also along India's entire western border.[145] He further recalled: "The Indian Air Force responded very quickly after the CCS approved the employment of airpower on India's side of the LoC.… After May 23, there were no professional differences whatsoever that could affect our teamwork or planning."[146]

KARGIL AND TODAY'S THREATS

This leaves us with the still-unanswered question as to whether the Kargil experience offers an instructive prototype for the most probable near-term threats that may face the IAF along India's borders with Pakistan and China in the decade ahead. Without question, the unusually demanding challenges presented by Operation Safed Sagar made for a sobering wake-up call for the IAF, which evidently had not given much thought to such a scenario and had not trained routinely at such elevations until it was forced to do so by operational necessity. Not long after the fighting ended, Indian defense experts began contemplating such limited engagements in time and scale as the most likely wave of the future with respect to any provocations of that sort that might arise anew along the volatile LoC running through Kashmir. In that regard, Air Commodore Singh voiced the opinion of many when he called Kargil "a template for limited war and future options if war becomes inevitable."[147]

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Viewed in hindsight, the Kargil War is replete with insights into the dynamics of deterrence in the Indo-Pakistani relationship. Especially important in this regard, Pakistan's military leaders miscalculated badly in their apparent belief that the international community would press immediately for a cease-fire in Kashmir out of concern over a possible escalation of the fighting to the nuclear level, with the net result that Pakistan would be left with an easily acquired new slice of terrain on the Indian side of the LoC. In addition, General Malik later suggested that those who concocted the incursion gambit had erroneously convinced themselves that a stable deterrent relationship between India and Pakistan at the nuclear level would enable a Pakistani conventional offensive into Kashmir with virtual impunity. That analysis was based on the putative premise that India would not counter the provocation with an all-out conventional response that would risk either escalation or ending in a costly stalemate.[148]

Since the Vajpayee government scrupulously kept its combat operations confined to Indian-controlled Kashmir, the international community had no compelling reason to intervene.

In the end, both of those likely Pakistani assumptions proved unfounded. The nuclear balance between the two countries did *not* deter a determined Indian conventional response, and the successful reaction that India ultimately mounted on the Kargil heights fell well short of being all-out in scale. Furthermore, since the Vajpayee government scrupulously kept its combat operations confined to Indian-controlled Kashmir, the international community had no compelling reason to intervene.

As a result, a remote but high-intensity and high-stakes showdown was allowed to run on for more than two months, something the Pakistan Army's leaders all but certainly did not anticipate when they first conjured up their incursion plan. Indeed, in the view of a retired Indian Army major general, Pakistan's military leaders "had not thought beyond the first week or 10 days" in their approach to planning the confrontation. They also, the general suggested, all but surely did not bargain on the combat involvement of Indian airpower.[149] An informed and insightful former Pakistan Army brigadier later well characterized the introduction of IAF fighters into the conflict on May 26 as an effective asymmetric vertical escalation that Pakistan could not match without running unbearable risks of a larger and more consequential confrontation.[150]

The Kargil experience also suggested that if China and Pakistan came to appreciate that India possessed an overwhelming conventional force preponderance in the region, that presence could act as a deterrent against such provocations in the future. Such a realization ultimately led to a new Indian declaratory policy toward that end that was

enunciated in January 2000 by India's then minister of defense, George Fernandes.[151] At a seminar in New Delhi that month, Fernandes observed that in precipitating the Kargil War, Pakistan "had not absorbed the real meaning of nuclearization—that it can deter *only* the use of nuclear weapons, but not all and any war." The overarching teaching of the war experience, he added, was that nuclear weapons had not rendered war in the region obsolete or made "covert war by proxy … the only option." A no less important teaching, Fernandes said, was that "conventional war remained feasible, but with definite limitations [now] if escalation across the nuclear threshold was to be avoided."[152]

> The Kargil experience suggested that if China and Pakistan came to appreciate that India possessed an overwhelming conventional force preponderance in the region, that presence could act as a deterrent against such provocations in the future.

A related question of note here concerns the extent to which the IAF's role in helping to enable India's successful outcome in Operation Vijay may offer a central ingredient of *conventional* deterrence against future such provocations. In this regard, a reflective IAF warrior/scholar suggested that the IAF's "never done before" high-elevation interdiction operations during the Kargil fighting contributed significantly to the achievement of the government's ultimate strategic goal of evicting Pakistan's forces from the positions that they had occupied. He further observed that its telling strikes against enemy troop emplacements and supply dumps "created a strategic effect" by forcing Pakistan's leadership to reassess its strategy of conducting an open-ended proxy war against India. This airman added that those operations "also silenced critics within India who [previously had] felt that airpower was essentially escalatory in nature."[153]

Without a doubt, the air balance throughout the Kargil War stood markedly in India's favor, with an overall fighter force ratio of 750 to 350. With respect to the most cutting-edge fighters then fielded by the two sides, Pakistan's inventory of just 26 U.S.-provided F-16As was greatly outmatched numerically, and perhaps qualitatively as well, by the IAF's 145 highest-performance aircraft (70 MiG-29s, 45 Mirage 2000Hs, and 30 Su-30s).[154] Air Commodore Singh suggested that this advantage in India's favor "clearly deterred Pakistan from using its air force to come to the rescue of its soldiers, whose large numbers were being killed by the Indian Army and Air Force [and were] being denied critically needed supplies like ammunition, rations, and reinforcements."[155]

Yet at the same time, prudent Indian defense planners will likely find themselves short-changed in their preparations for the full spectrum of possible challenges to their country's security in years to come if they draw undue comfort from the happy ending of

the Kargil experience and accept that conflict as their *only* planning baseline for hedging against future contingencies along the LoC. Much like NATO's air war for Kosovo that unfolded in the Balkans at roughly the same time, the Kargil War was a poor test of India's air warfare capability. The IAF's fighter pilots were consigned to do what they could rather than what they might have done in a less restricted engagement in which they would not have been bound by such operating constraints. Moreover, like NATO's roughly concurrent Operation Allied Force against Serbia, the enemy had the initiative throughout most of the Kargil War, and both the nature of the operational challenge the IAF faced in the Kargil heights and the targeting requirements that ensued from that challenge necessarily dictated an unconventional and suboptimal use of India's increasingly capable air weapon.[156]

Prudent Indian defense planners will likely find themselves shortchanged in their preparations for the full spectrum of possible challenges to their country's security in years to come if they draw undue comfort from the happy ending of the Kargil experience and accept that conflict as their *only* planning baseline for hedging against future contingencies along the Line of Control.

A decade after Operation Safed Sagar's successful conclusion, Air Marshal Patney observed that "Pakistan had a reasonably good air force but elected not to use it or was wary of the consequences of its use.... [It] handed over air dominance to India without a fight. Had Pakistan offered [aerial] combat... the pattern of air activity would have been very different. We would have had to fight for air dominance, even if it was at the cost of other air operations of the war."[157] That suggests that a bolder Pakistani risk calculus, or even an inadvertent escalation dynamic emanating from misjudgment on either side, could have resulted in a higher-intensity showdown over the same initial stakes. That escalated conflict, in turn, would have demanded a far more robust and sustainable Indian conventional force posture than that which prevailed well enough over Pakistan in 1999.

Ultimately, one can only speculate as to what kept a major aerial clash between the IAF and PAF from occurring at any time during the Kargil fighting. However, it is clear that a recurring border challenge along the LoC in years yet to come could end up presenting a more demanding test of the IAF's strength than the Kargil conflict that would require a more exacting approach to airpower employment. Insofar as India's clear preeminence in the bilateral air balance contributed materially to its success in 1999, the IAF should have every incentive henceforth to sustain a no-less-pronounced combat edge over Pakistan in its future force development. It should also have strong motivations to maintain at least a local preponderance of air capability along India's border with China.

For students of air warfare, the IAF's combat experience during the 1999 Kargil War reaffirmed a number of abiding characteristics of modern air arms around the world today. It showed, for example, that innovation and adaptability under the stress of confining rules of engagement—in this case the Vajpayee government's strict injunction that the IAF not cross the LoC under any circumstances—is a generic hallmark of modern airmanship. It further showed that professionalism in such operationally crucial matters as campaign planning, presentation of forces, accommodation of new and unique tactical challenges (in this instance the need to engage hard-to-see targets in unprecedentedly high-elevation Himalayan battlespace), and effectively underwriting the needs of a joint force commander is scarcely a monopoly of more familiar Western air arms. It demonstrated yet again how the effective application of air-delivered firepower, particularly if unmatched by the opposing side, can shorten and facilitate the outcome of an engagement that might otherwise have persisted indefinitely.

And when it comes to still-needed improvements in the joint arena, it showed that an absence of transparency in cross-service communication, to say nothing of interdependence in campaign planning, is by no means a malaise unique to the United States and its allies. On this important count, an informed Indian assessment of useful teachings to be drawn from the Kargil experience underscored the post-campaign "revelations about the quarreling between the air force and army chiefs over the use of airpower in Kargil" and concluded that "the problem is clearly not a minor one. At least one lesson … of Kargil appears not to have been sufficiently well learned—the high cost of bureaucratic politics."[158] The issue is still controversial, and many observers of India's military organization and defense decisionmaking arrangements, both in India and worldwide, have argued for some time that a major step toward ameliorating that high cost, at least at the margins, would be to create the position of chief of the Defense Staff. The job of the new chief would be to oversee and adjudicate interservice differences when it comes to the apportionment of military roles and resources, as has long been the practice in the United States (with its chairman of the Joint Chiefs of Staff) and in most other developed Western countries.

THE BROADER STRATEGIC OUTLOOK

As for the broader implications of the Kargil benchmark for deterrence and international security, that war was the first serious border conflict of sustained duration between two nuclear-armed antagonists that ended with a clear winner and loser at the conventional

level.[159] Although it is always risky to try to generalize from a singular and, in many ways, unique case of that sort, the Kargil War nonetheless offers much food for creative thought regarding a number of generic issue areas, such as the escalation dynamics that govern a bilateral nuclear relationship of major tension. It underlines the importance of avoiding such escalation-prone thresholds as India's crossing of the LoC to carry the fighting into Pakistan, and Pakistan's engagement of IAF fighters servicing NLI targets on India's side of the LoC. And it reminds military planners of the ever-present possibility that inadvertent leadership misjudgment on either side regarding the other's limits of tolerance could lead to a breach of the nuclear taboo that neither player wants or could possibly profit from.

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The confrontation also showed India the downside strategic consequences of an avowed nuclear no-first-use policy that necessarily put the country's government in a reactive mode when it came to the prospect of inadvertent nuclear escalation. By the same token, for Pakistan's leaders, the unexpected—and unexpectedly sharp and intense—response that their provocation prompted from the Indian Army and IAF should make them think twice about the limits of their nuclear deterrent. More to the point, it should have had a tempering influence on their initial presumptions about the extent to which merely having a credible nuclear attack capability in and of itself empowered them to try conventional acts of territorial acquisition with impunity. To that extent, it should have instilled as well a healthy once-burned, twice-shy mind-set among those leaders and their successors who might be tempted to undertake a reprise of that gambit some day in the future—particularly in light of the persistent regional imbalance of conventional air-power in India's pronounced favor.

For both protagonists, the war represented a real-world battle laboratory for reconfirming something the leaders of NATO and the Warsaw Pact came to learn during the height of the Cold War in Central Europe a generation before. A stable bilateral nuclear deterrence relationship at the strategic level can markedly constrain in intensity and scale, if not inhibit entirely, recurrent flash points that, in the absence of such a relationship, might have every chance of erupting into an open-ended conventional showdown for the highest stakes. But the Kargil War demonstrated that nuclear deterrence is clearly not a panacea. The possibility of future conventional wars of major consequence along India's northern borders with Pakistan and China persists, and the Indian defense establishment must plan and prepare accordingly.

NOTES

1 Flight Level 200 (pronounced "two-zero-zero" in aviator parlance) is 20,000 feet above sea level.

2 A comprehensive assessment of the IAF and its near-term force development plans will appear in Benjamin S. Lambeth, *India's Transforming Air Posture: An Emerging 21st-Century Heavyweight* (Santa Monica, Calif.: RAND Corporation, forthcoming). Without question the most authoritative treatment of the IAF's evolution and capabilities to date from an informed Indian airman's perspective is the magisterial valedictory volume encapsulating a career's worth of involvement with the subject by Air Commodore Jasjit Singh, IAF (ret.), *Defence from the Skies: Indian Air Force Through 75 Years* (New Delhi: Knowledge World, 2007).

3 In a clear early testament to this fact, the IAF's inaugural No. 1 Squadron established on April 1, 1933, was expressly designated the "Army Cooperation Squadron," and all subsequent squadrons for years thereafter were formally assigned the "army cooperation role" as they were stood up. See Group Captain A. S. Bahal, IAF, "Strategic Roles of Air Power: Think, Plan, Equip and Train for It," *Air Power Journal* (New Delhi) (Spring 2007): 9.

4 Air Marshal V. K. Bhatia, IAF (ret.), "Forecast for 2030," *SP's Aviation* (New Delhi), September 2009, 40.

5 In a credible indicator of rank-and-file views in this regard, the most sophisticated effort yet undertaken to measure Indian popular attitudes toward foreign and strategic policy matters conducted by the Chicago Council on Global Affairs in 2007 found that terrorism, Islamic fundamentalism, and tensions between India and Pakistan all ranked higher on the roster of assessed threats than China's ongoing development as a military power. (Cited in Stephen P. Cohen and Sunil Dasgupta, *Arming without Aiming: India's Military Modernization* [Washington, D.C.: Brookings Institution Press, 2010], 14.)

6 *Into the Blue Yonder: Understanding Aerospace Power* (New Delhi: Indian Air Force, Air Headquarters, October 8, 2007), 22.

7 Singh, *Defence from the Skies*, 251.

8 Air Marshal P. K. Pandey, IAF (ret.), "Meeting the Challenges: IAF 2020," *Indian Defence Review*, (December 2007): 61. In keeping with India's fundamentally defensive strategic orientation and mindset, the most basic principle of the country's nuclear doctrine at the execution level is its insistence on no first use of nuclear weapons. No first use was initially proposed by India to Pakistan in 1994 (unsuccessfully) as a formal arms control measure and has been reaffirmed by a succession of India's political leaders ever since. For an informed discussion of the roots of this policy and its practical bearing on India's security situation and breadth of strategic options, see Ashley J. Tellis, *India's Emerging Nuclear Posture: Between Recessed Deterrent and Ready Arsenal* (Santa Monica, Calif.: RAND Corporation, MR-1127-AF, 2001), 302–12.

9 For informative overview assessments of this regional war, see Air Commodore Jasjit Singh, IAF (ret.), ed., *Kargil 1999: Pakistan's Fourth War for Kashmir* (New Delhi: Knowledge World, 1999); Ashley J. Tellis, C. Christine Fair, and Jamison Jo Medby, *Limited Conflicts Under the Nuclear Umbrella: Indian and Pakistani Lessons from the Kargil Crisis* (Santa Monica, Calif.: RAND Corporation, MR-1450, 2001); and Peter R. Lavoy, ed., *Asymmetric Warfare in South Asia: The Causes and Consequences of the Kargil Conflict* (Cambridge: Cambridge University Press, 2009).

10 The term "joint," in standard military usage, refers to the cooperative involvement of two or more armed services in a combat, peacekeeping, or humanitarian operation.

11 Air Commodore Jasjit Singh, IAF (ret.), "Kashmir, Covert Wars, and Air Power," *Air Power Journal* (New Delhi) (Summer 2005): 79.

12 Burton Stein, *A History of India* (Oxford: Oxford University Press, 2010), 358.

13 Preeti Kumar, "Sustaining Air Bridges," *Strategic Affairs* (New Delhi), (October 2008): 8. These two top military leaders were said to have obtained the "in principle" go-ahead from Pakistan's Prime Minister Nawaz Sharif without having offered him any specifics regarding the planned incursion. For an informed account of the motivations that most likely underlay this Pakistani initiative by a since-retired Pakistani Army brigadier, see Shaukat Qadir, "An Analysis of the Kargil Conflict 1999," *Journal of the Royal United Services Institution* (April 2002): 24–27.

14 See "The Lahore Declaration," Washington, D.C.: U.S. Institute of Peace, Peace Agreements Digital Collection, posted February 23, 1999.

15 Such a presumption could have animated the Pakistani incursion's planners even if, as seems most likely, the possibility of actual nuclear weapons use in the worst case never figured seriously in their calculations.

16 Major General G. D. Bakshi, Indian Army (ret.), "Kargil: Dynamics of a Limited War Against a Nuclear Backdrop," *CLAWS Journal* (Summer 2009): 43. The journal is a publication of the Centre for Land Warfare Studies in New Delhi.

17 Ibid., 44.

18 "1999 Kargil Conflict," GlobalSecurity.org. www.globalsecurity.org/military/world/war/kargil-99.htm.

19 Air Commodore Jasjit Singh, IAF (ret.), "Some Reflections on the IAF," *Air Power Journal*, (New Delhi) (Monsoon 2004): 179.

20 Bakshi, "Kargil: Dynamics of a Limited War Against a Nuclear Backdrop," 44.

21 Government of India, National Security Council Secretariat, Kargil Review Committee, *From Surprise to Reckoning: The Kargil Review Committee Report* (New Delhi: Sage, 2000), 227.

22 Pushpindar Singh, *Himalayan Eagles: History of the Indian Air Force*, Volume III: World Air Power (New Delhi: The Society for Aerospace Studies, 2007), 108.

23 Rahul Bedi, "Paying to Keep the High Ground," *Jane's Intelligence Review* (October 1999): 31.

24 Air Marshal Vinod Patney, IAF (ret.), "1999 War in Kargil and Its Aftermath," New Delhi: Centre for Air Power Studies, briefing to a group of successor-generation IAF officers, September 8, 2011.

25 For a well-researched assessment of the ground fighting conducted by the Indian Army during the 74-day counteroffensive, see John H. Gill, "Military Operations in the Kargil Conflict," in Lavoy, ed., *Asymmetric Warfare in South Asia*, 92–129. See also Captain Marcus P. Acosta,

"High-Altitude Warfare: The Kargil Conflict and the Future," thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts in National Security Affairs, Monterey, Calif.: Naval Postgraduate School, June 2003. A more condensed version of the latter account is presented in Major Marcus P. Acosta, "The Kargil Conflict: Waging War in the Himalayas," *Small Wars and Insurgencies* (September 2007): 397–415.

26 Air Commodore Arjun Subramaniam, IAF, "Kargil Revisited: Air Operations in a High-Altitude Conflict," *CLAWS Journal* (New Delhi), (Summer 2008): 186. At the time of the Kargil War, the IAF operated most of the Indian military's rotary-wing aircraft, including several variants of attack helicopters.

27 Acosta, "High-Altitude Warfare: The Kargil Conflict and the Future," 58.

28 Bedi, "Paying to Keep the High Ground," 31.

29 Comments on an earlier draft by Air Marshal Vinod Patney, IAF (ret.), August 16, 2011, and Patney, "1999 War in Kargil and Its Aftermath."

30 Western Air Command, comprising sixteen bases and headquartered in New Delhi, is the largest and most important of five IAF regional commands throughout India. Like the other four, it is both a force provider organization for joint combat and training operations and a theater-level warfighting command within its assigned area of responsibility.

31 Patney, "1999 War in Kargil and Its Aftermath."

32 "Kargil—Daily Progress of Op Safed Sagar," http://vayu-sena.tripod.com/kargil-summary1.html.

33 Patney, "1999 War in Kargil and Its Aftermath."

34 Air Chief Marshal A. Y. Tipnis, IAF (ret.), "Operation Safed Sagar," *Force* (New Delhi), (October 2006): 6.

35 Ibid., 8.

36 Ibid., 8–10.

37 Ibid. On this point, according to a still-serving senior IAF leader who was closely involved in preparations for the IAF's entry into the campaign at the operational and tactical level, "the army was caught unawares and … wanted to retrieve the situation by asking the IAF for help without taking the issue to the prime minister." That ultimately unsuccessful bid reflected "a poor appreciation of the situation by the army at that stage," as well as its "lack of knowledge about the limited operational capability of the IAF's helicopters." (Comments on an earlier draft, December 4, 2011.)

38 Tipnis, "Operation Safed Sagar," 8–10.

39 Ibid. In the retrospective view of a still-serving senior IAF leader, "the escalation aspect was overstressed" by the IAF chief, and the army leadership interpreted that legitimate avowed concern as the rationalization for an IAF reluctance to lend its support to the army, which "was absolutely wrong." (Comments on an earlier draft, December 4, 2011.)

40 Tipnis, "Operation Safed Sagar," 12. In a tacit affirmation of this recollection by Tipnis of the army's stance during its initial days of jockeying for bureaucratic position, the army chief, General Malik, later recalled that "on May 17, I asked the DGMO [Director General of Military Operations] and VCOAS [Vice Chief of Army Staff] if I should return to New Delhi immediately. Both advised me that as the situation was well within the capability of 15 Corps and Northern [Army] Command, there was no need for me to do so." (Ved Prakash Malik, *Kargil: From Surprise to Victory* [New Delhi: HarperCollins, 2006], 109.)

41 Tipnis, "Operation Safed Sagar," 12.

42 Comments on an earlier draft by a still-serving senior IAF leader who was closely involved in preparations for the IAF's entry into the campaign at the operational and tactical level, December 4, 2011.

43 Tipnis, "Operation Safed Sagar," 12.

44 "Kargil—Daily Progress of Op Safed Sagar," http://vayu-sena.tripod.com/kargil-summary1.html. The air chief also met with the IAF fighter squadron commanders and some of the line pilots ("my boys") at Srinagar who would take part in the looming counteroffensive. He later reported that they were "straining at the leash to get going." (Tipnis, "Operation Safed Sagar," 14.)

45 On the plus side, as one informed senior IAF leader later remarked with regard to these charges, "those in the [Indian] Army who had some first-hand knowledge [of the cross-service deliberations during the lead-up to Operation Vijay] have not been so exasperatingly vituperative." (Comments on an earlier draft by retired Air Marshal Vinod Patney, IAF, August 16, 2011.)

46 For the full record of this pointed and, at times, intemperate contretemps, see Lieutenant General Harwant Singh, Indian Army (ret.), "Kargil Once More: Higher Defence Management Needs Reorganisation," *Force* (New Delhi), November 2006; Lieutenant General Harwant Singh, Indian Army (ret.), "Kargil Controversy: Mismanagement of Higher Defence," *Indian Defence Review* (New Delhi), October–December 2009; Air Marshal R. S. Bedi, "Kargil Controversy: An IAF Response," *Indian Defence Review* (New Delhi), January–March 2010; Lieutenant General Harwant Singh, Indian Army (ret.), "Kargil Controversy: Army Pinpoints IAF Failures," *Indian Defence Review* (New Delhi), April–June 2010; and Air Marshal Narayan Menon, IAF (ret.), "Kargil Controversy: IAF on the Ghosts of Kargil," *Indian Defence Review* (New Delhi), July–September 2010.

47 Singh, *Himalayan Eagles: History of the Indian Air Force*, Volume III: World Air Power, 111, and "Kargil—Daily Progress of Op Safed Sagar," at http://vayu-sena.tripod.com/kargil-summary1.html.

48 Singh, *Himalayan Eagles: History of the Indian Air Force*, Volume III: World Air Power, 111.

49 Air Commodore Ramesh V. Phadke, IAF, "Air Offensive in the High Himalayas," *Strategic Analysis* (New Delhi), (December 1999): 1606. Notably, the IAF assigned that designator to its impending counteroffensive over Kargil well before the code name for the joint-service Operation Vijay was coined. (Comments on an earlier draft by retired Air Marshal Vinod Patney, IAF, August 16, 2011).

50 The pilot, Flight Lieutenant Kambampati Nachiketa, was repatriated on June 3 after having been held prisoner of war for about a week.

51 Tipnis, "Operation Safed Sagar," 14.

52 Comments on an earlier draft by Air Marshal Vinod Patney, IAF (ret.), August 16, 2011. Air Marshal Patney later characterized Squadron Leader Ahuja's decision to divert from his assigned mission and to join the search for the downed MiG-27 pilot as an act of bravery beyond the call of duty. (Patney, "1999 War in Kargil and Its Aftermath.") Ahuja was posthumously awarded the Vir Chakra, India's third-highest decoration for gallantry under fire. He was the sole IAF member among eight Indian combatants in all who earned medals for gallantry during the Kargil War.

53 Tipnis, "Operation Safed Sagar," 14.

54 As reported by the Israeli Air Force commander, Major General Binyamin Peled, to Secretary of State Henry Kissinger during an after-action briefing on the war's results. Declassified White House memorandum, October 22, 1973.

55 Until the Kargil War erupted, only the IAF's MiG-23BNs and a few Jaguars and MiG-27s had been provisioned with infrared countermeasures against such surface-to-air missiles. Since then, the entire IAF fighter inventory has been fitted with such improvements. See Rupak Chattopadyay, "The Indian Air Force: Flying into the 21st Century," *Military Technology* (New Delhi), (May 2002): 44. In contrast, any IAF helicopters likely to venture into harm's way had long been configured with flare dispensers. (E-mail communication to the author by retired Air Marshal Vinod Patney, IAF, August 27, 2011.)

56 Subramaniam, "Kargil Revisited: Air Operations in a High-Altitude Conflict," 187.

57 Air Commodore Kaiser Tufail, PAF (ret.), "Kargil 1999: The PAF's Story," *Vayu Aerospace and Defence Review* (New Delhi), Issue 3 (2009): 98.

58 On this point, as the AOC-in-C of Western Air Command at the time later recalled, "I think my insistence to mount CAPs across the [command's entire area of responsibility] at different heights and times to give the message that I was ready and angling for an enlarged conflict helped. It was akin to throwing a glove, but it was not picked up." (Comments on an earlier draft by retired Air Marshal Vinod Patney, IAF, August 16, 2011.)

59 Tipnis, "Operation Safed Sagar," 13. Tipnis admitted that he had not formally sought such approval authority from the prime minister during the pivotal Cabinet Committee on Security meeting the day before the campaign started. However, he said, "I considered the 'liberty' an essential element for the success of the aerial air defense measures. In view of the [prime minister's] earlier 'nod' to the ground forces' hot pursuit, my conscience was not unduly burdened."

60 Group Captain D. N. Ganesh, IAF, "Indian Air Force in Action," in Singh, ed., *Kargil 1999: Pakistan's Fourth War for Kashmir*, 183.

61 E-mail communication to the author by Air Marshal Vinod Patney, IAF (ret.), August 27, 2011.

62 "1999 Kargil Conflict," www.globalsecurity.org/military/world/war/kargil-99.htm.

63 In 1971, IAF fighters had flown night strike missions against PAF airfields situated in flat lowlands, but those attacks presented a far less daunting challenge to mission planners and pilots than conducting night combat operations over the highly variegated mountain terrain of the Himalayas. (Comments on an earlier draft by retired Air Marshal Vinod Patney, IAF, August 16, 2011.)

64 Colonel M. Sabharwal, Indian Army, "Joint Operations in Modern Warfare," *Air Power Journal* (New Delhi), (Spring 2006): 19.

65 Tipnis, "Operation Safed Sagar," 12.

66 "Kargil—Daily Progress of Op Safed Sagar," at http://vayu-sena.tripod.com/kargil-summary1.html.

67 Gill, "Military Operations in the Kargil Conflict," 114.

68 E-mail communications to the author by retired Air Marshal Vinod Patney, IAF, August 27 and 29, 2011. See also the highlights of a briefing given by Patney on July 12, 1999, as reported in "Op. Safed Sagar: Western Air Command Operations in Kargil," *Vayu Aerospace Review 2000* (New Delhi), Issue 5 (1999).

69 Phadke, "Air Offensive in the High Himalayas," 1608.

70 Air Chief Marshal Tipnis personally observed this precedent-setting event while flying on the wing of the lead aircraft in the aft cockpit of a two-seat Mirage 2000TH. (Tipnis, "Operation Safed Sagar," 16.)

71 Singh, *Himalayan Eagles: History of the Indian Air Force*, Volume III: World Air Power, 125.

72 Prasun K. Sengupta, "Mountain Warfare and Tri-Service Operations," *Asian Defence Journal* (October 1999): 25.

73 Ibid., 121.

74 Ganesh, "Indian Air Force in Action," 184.

75 Comments on an earlier draft by retired Air Marshal V. K. "Jimmy" Bhatia, IAF, August 18, 2011. On this point, in the retrospective view of a still-serving IAF leader who headed the initial integration of the Litening pod with the Mirage 2000H and Jaguar and who flew most of the associated fight test sorties, "the Mirages with the LGBs should have been used from Day One," since the integration had been essentially completed and declared fit for operational use three months before, in January 1999. A duly conservative final certification of the pods for actual combat employment, he added, might have required as much as a week to complete once the start of Operation Safed Sagar was clearly imminent, but "ego hassles" and other sources of bureaucratic pushback occasioned a needless—and costly—delay in the first use of laser-guided bombs until June 24. (Comments on an earlier draft, December 4, 2011.)

76 Singh, *Himalayan Eagles: History of the Indian Air Force*, Volume III: World Air Power, 122, and Bedi, "Kargil: An IAF Perspective," 152.

77 Bakshi, "Kargil: Dynamics of a Limited War Against a Nuclear Backdrop," 45.

78 For a well-documented account of the various conflicting casualty numbers on both sides, see Gill, "Military Operations in the Kargil Conflict," 122.

79 "1999 Kargil Conflict," www.globalsecurity.org/military/world/war/kargil-99.htm.

80 Bedi, "Kargil: An IAF Perspective," 151.

81 Tufail, "Kargil 1999: The PAF's Story," 97–98.

82 Bedi, "Paying to Keep the High Ground," 31.

83 Ganesh, "Indian Air Force in Action," 178–79.

84 E-mail communication to the author by Air Marshal Vinod Patney, IAF (ret.), August 27, 2011.

85 Jaswant Singh, *In Service of Emergent India: A Call to Honor* (Bloomington, Ind.: University of Indiana Press, 2007), 203.

86 As a still-serving IAF fighter pilot later explained in this regard, such factors had "never been calculated by any manufacturer for this type of altitude," with the result that "the very different attributes of the atmosphere at that altitude … cause weapons to go off their mark." See Ganesh, "Indian Air Force in Action," 180.

87 Acosta, "High-Altitude Warfare: The Kargil Conflict and the Future," 62.

88 E-mail communication to the author by Air Marshal Vinod Patney, IAF (ret.), August 27, 2011.

89 Comments on an earlier draft by Air Marshal Vinod Patney, IAF (ret.), August 16, 2011.

90 The effectiveness of artillery was also hampered at times by stark terrain features on the high mountain battlefield that dictated inefficient trajectory angles and often prevented the observation of hits.

91 On this still-contentious debating point in some Indian Army and IAF circles, however, Air Chief Marshal Tipnis himself was magnanimous to a fault in conceding freely six years later that "it was the army's leadership in this operation, we were only in support." (Tipnis, "Operation Safed Sagar," 16.)

92 Sayan Majumdar, "The IAF's M-MRCA Requirement: The Mirage Factor," *Vayu Aerospace and Defence Review* (New Delhi), Issue 5 (2005): 30.

93 Tellis, Fair, and Medby, *Limited Conflicts Under the Nuclear Umbrella*, 71.

94 "1999 Kargil Conflict," www.globalsecurity.org/military/world/war/kargil-99.htm.

95 Air Chief Marshal Fali Homi Major, IAF, "National Defence and Aerospace Power," *Air Power Journal* (New Delhi), (Spring 2009): 3.

96 "I Do Not See China to Be a Major Concern in My Area of Responsibility," interview with Air Marshal P. K. Barbora, IAF, Air Officer Commanding-in-Chief, Western Air Command, *Force* (New Delhi), (October 2008): 28.

97 Kargil Review Committee, *From Surprise to Reckoning*, 22, 105.

98 Bakshi, "Kargil: Dynamics of a Limited War Against a Nuclear Backdrop," 48, 50.

99 Acosta, "High-Altitude Warfare: The Kargil Conflict and the Future," 2. Close air support is commonly understood worldwide to entail "air action by fixed- and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and that require detailed integration of each air mission with the fire and movement of those forces." Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms* (Washington, D.C.: U.S. Government Printing Office, April 12, 2001), 90.

100 Acosta, "High Altitude Warfare: The Kargil Conflict and the Future," 58.

101 Comments on an earlier draft by Air Marshal Vinod Patney, IAF (ret.), August 16, 2011.

102 Tufail, "Kargil 1999: The PAF's Story," 98. GPS is an abbreviation for the American satellite-based Global Positioning System.

103 E-mail communication to the author by Air Marshal Vinod Patney, IAF (ret.), August 22, 2011. The low operating altitude of 500 feet above the terrain was permissible at night because the Pakistani intruders could not visually acquire the IAF's aircraft for targeting using the optical sights on their shoulder-fired surface-to-air missiles. Of course, this GPS-aided level bombing technique was limited significantly by the accuracy of the target coordinates provided to the IAF's pilots. As Air Marshal Patney recalled, "the army was only able to give us rough coordinates, as they had no means to be accurate given the size and nature of the targets that were difficult to discern from the ground as well as from the air.… Hence air-to-ground attacks were at best against approximations of target positions.… As an illustration of the wisdom of the technique, on a mission at night, we launched six aircraft with two bombs each at intervals of one minute against the same target. The next morning, a reconnaissance run showed that there were 10 craters in the snow in really close proximity. Unfortunately, the target coordinates were faulty." Ibid.

104 Tipnis, "Operation Safed Sagar," 16.

105 Ganesh, "Indian Air Force in Action," 186.

106 Sengupta, "Mountain Warfare and Tri-Service Operations," 26.

107 The air component commander in support of Operation Vijay later expounded further on these instances of IAF improvisation under duress: "Difficulties in establishing target coordinates accurately and the small, well-camouflaged nature of the targets prompted one of our younger pilots to carry a small video camera with him in a fighter and to film the area of interest so that an immediate reconnaissance report was available and at an expanded scale. This is only one of many instances where initiative was used and out-of-the-box thinking was resorted to. Other examples were the system of area radar coverage [in support of the IAF's CAP operations] and the use of the MiG-25R at a lower altitude to improve the resolution of its pictures." (E-mail communication to the author by Air Marshal Vinod Patney, IAF [ret.], August 22, 2011.) Such improvised development of solutions to major problems under the pressure of immediate operational need, more often than not by exceptionally clever and creative junior officers, is a distinctive cultural trait of professional airmen the world over known in Indian parlance as *jugaad*, sometimes translated loosely as "frugal engineering." (Comments on an earlier draft by retired Air Marshal V. K. "Jimmy" Bhatia, IAF, August 18, 2011.)

108 Acosta, "High Altitude Warfare: The Kargil Conflict and the Future," 60 and Bedi, "Paying to Keep the High Ground," 31.

109 Tipnis, "Operation Safed Sagar," 14.

110 Bedi, "Paying to Keep the High Ground," 31.

111 Singh, *Himalayan Eagles: History of the Indian Air Force*, Volume III: World Air Power, 125, reported that the IAF delivered a total of nine laser-guided bombs against enemy targets during the Kargil war, eight by Mirage 2000Hs and one by a Jaguar. The air commander for the campaign, however, distinctly recalls that only two were expended in toto, both against the target complex on Tiger Hill. In his words, "we could not find a suitable target for more such attacks. For the more spread-out interdiction targets, well-directed 1,000-pound [unguided] bombs were the weapon of choice." (E-mail communication to the author by Air Marshal Vinod Patney, IAF [ret.], August 2, 2012.) Either way, what matters most here is not the total count, but the fact that the use of laser-guided bombs during the Kargil campaign was a significant and militarily effective combat first for the IAF.

112 Singh, *Himalayan Eagles: History of the Indian Air Force*, Volume III: World Air Power, 124.

113 Subramaniam, "Kargil Revisited: Air Operations in a High-Altitude Conflict," 186.

114 Harinder Baweja, *A Soldier's Diary: Kargil The Inside Story* (New Delhi: Books Today, 2000), 68.

115 Ganesh, "Indian Air Force in Action," 180–81. By blindly adhering to just such a "dogged tendency," the Soviet Air Force lost more than a hundred of its ground attack fighters and 300 attack helicopters to mujahideen infrared surface-to-air missiles and antiaircraft guns during its ten-year combat involvement over similar hostile terrain in Afghanistan. (General Mohammad Yahya Nawroz, Afganistan Army [ret.] and Lieutenant Colonel Lester W. Grau, USA [ret.], "The Soviet War in Afghanistan: History and Harbinger of Future War?" Fort Leavenworth, Kans.: Foreign Military Studies Office, 1995.

116 Acosta, "High Altitude Warfare: The Kargil Conflict and the Future," 43. On this point, in all fairness to the IAF, the air component commander for Operation Vijay later remarked that "there is no way that anyone can give an accurate account of the results of CAS missions," since "the targets were small and the army generally referred to a general area and not to exact and accurate coordinates…. The targets were so small that a post-attack reconnaissance pass would not help." (E-mail communication to the author by retired Air Marshal Vinod Patney, IAF, August 29, 2011.)

117 Ganesh, "Indian Air Force in Action," 185.

118 It also might be noted that in the case of laser-guided bomb employment, a higher release altitude is actually preferable tactically because it gives the weapon more time to acquire its target and to gain energy while guiding to its laser spot.

119 Acosta, "High Altitude Warfare: The Kargil Conflict and the Future," 34. On this still-disputatious point among many land combatants who have studied the Kargil War, it may well be that given the near-prohibitive environmental and operational circumstances that prevailed in the high mountain war zone, close air support, strictly defined, "was a bust at Kargil," as a U.S. Marine Corps officer later alleged. (Lieutenant Colonel Scott W. Pierce, USMC, "Mountain and Cold Weather Warfighting: Critical Capability for the 21st Century," Fort Leavenworth, Kans.: School of Advanced Military Studies, United States Army Command and General Staff College, 2008, 35.) By no means, however, could the same be said of the broader indirect fire support and interdiction that the IAF provided to 15 Corps during Operation Vijay. Most Indian Army commentators have readily acknowledged the latter to have been both effective and deeply appreciated, especially during the campaign's last two weeks.

120 Ganesh, "Indian Air Force in Action," 185.

121 Comments on an earlier draft by Major General G. D. Bakshi, Indian Army (ret.), August 24, 2011.

122 "1999 Kargil Conflict," www.globalsecurity.org/military/world/war/kargil-99.htm.

123 Ganesh, "Indian Air Force in Action," 184.

124 E-mail communication to the author by Air Marshal Vinod Patney, IAF (ret.), August 29, 2011.

125 Singh, *Himalayan Eagles: History of the Indian Air Force*, Volume III: World Air Power, 108–109.

126 It should be added in passing here that senior officers from all three Indian services have since opined that the Vajpayee government's insistence that Indian forces not cross the LoC under any circumstances during the Kargil War constituted a major "lost opportunity" in the country's systemically conflicted relationship with Pakistan. (Comments on an earlier draft by retired Air Marshal Vinod Patney, IAF [ret.], August 16, 2011.) For example a former Indian Army vice chief wrote in 2009: "There was no great captain in the Indian military who could urge the political executive to let him seize the opportunity offered by Pakistan to take the bull by the horns.… Instead, the army chief acquiesced to troops being condemned to frontal attacks.… Our timid response at Kargil laid the foundation for future terrorist attacks.…" (Harwant, "Kargil Controversy: Mismanagement of Higher Defence.") More recently, a former Indian Navy chief also characterized Kargil as "the last battle of World War II fought with massive frontal attacks and artillery barrages," adding that "had there been some cool-headed, joint, and strategic thinking when the Kargil intrusions were detected, we could have widened the conflict, kept the Paks engaged on land, and blockaded them by sea. Already in dire economic straits, they would have come to their knees soon. Of course, this would have required political will." (E-mail communication to the author by former chief of Naval Staff Admiral Arun Prakash, Indian Navy [ret.], August 18, 2011.)

127 Gill, "Military Operations in the Kargil Conflict," 107–108.

128 See Kargil Review Committee, *From Surprise to Reckoning*.

129 Ibid., 20.

130 Phadke, "Air Offensive in the High Himalayas," 1605.

131 Ibid., 1609.

132 Malik, "The Kargil War," 3, 12.

133 Rajesh M. Basrur, "The Lessons of Kargil as Learned by India," in Lavoy, ed., *Asymmetric Warfare in South Asia*, 315.

134 Manu Pubby, "Kargil Revisited: Vigil Without End," *Defence and Technology* (New Delhi), (July–August 2009): 29.

135 Group Captain R. G. Burli, IAF, "Offensive Air Power in the High Mountains," *Air Power Journal* (New Delhi), (Spring 2007): 91–92.

136 Subramaniam, "Kargil Revisited: Air Operations in a High-Altitude Conflict," 185.

137 Tufail, "Kargil 1999: The PAF's Story," 97–99.

138 *Doctrine of the Indian Air Force* (New Delhi: Indian Air Force, Air Headquarters, Air War Strategy Cell, IAP 2000, October 6, 1995), 67.

139 This experience, it might be noted, was a remarkable precursor to U.S. Central Command's similarly flawed Operation Anaconda in Afghanistan in March 2002, in which CENTCOM's land component also sought initially to go it alone and the air component likewise intervened in barely sufficient time to help underwrite a satisfactory outcome in the end. For a comparison of Operations Vijay and Anaconda that draws out the many similarities between the two, see Subramaniam, "Kargil Revisited: Air Operations in a High-Altitude Conflict," 191–94. A full account of the latter experience may be found in Benjamin S. Lambeth, *Air Power against Terror: America's Conduct of Operation Enduring Freedom* (Santa Monica, Calif.: RAND Corporation, MG-166-1-CENTAF, 2005), 163–231.

140 Subramaniam, "Kargil Revisited: Air Operations in a High-Altitude Environment," 187.

141 Ganesh, "Indian Air Force in Action," 185.

142 See www.ndtv.com/news/india/wronged-kargil-hero-gets-his-due-28060.php.

143 Air Marshal N. Menon, IAF (ret.), "Remember Kargil," *SP's Aviation* (New Delhi), (June 2009): 40. To cite just one illustration in point here, a notable interoperability problem highlighted by the Kargil experience was that the Indian Army and the IAF used different communications systems, with only army units at the time equipped with digital radios. Anil R. Pustam, "Mountain Air Support Demands Special Equipment and Training," *Proceedings*, U.S. Naval Institute, September 2000, 70–71.

144 Menon, "Remember Kargil," 40.

145 With regard to the maritime dimension of India's response, in a determined anticipatory move to help deter Pakistan from escalating the fighting into a larger war once India was fully engaged against the NLI intruders, the Indian Navy went on full alert as early as May 20 and readied itself to blockade Pakistan's ports, principally Karachi, should an assessed need for such action arise. Toward that end, surface combatants configured for conducting missile firing and antisubmarine and electronic warfare were deployed in the North Arabian Sea. In the ensuing Operation Talwar (Hindi for "sword"), India's eastern and western fleets joined assets and blocked the Arabian Sea routes to Pakistan. Later, Pakistan's former prime minister Nawaz Sharif disclosed that Pakistan had been left with just six days of fuel to sustain combat operations had a full-scale war broken out. For a fuller treatment of this effective exercise in lateral escalation, see Vice Admiral G. M. Hiranandi, Indian Navy (ret.), *Transition to Guardianship: Indian Navy 1991–2000* (New Delhi: Lancer Publishers, 2009), 63–71.

146 Ibid., 11.

147 Singh, "Kashmir, Covert Wars, and Air Power," 83.

148 General V. P. Malik, Indian Army (ret.), "The Kargil War: Some Reflections," *CLAWS Journal* (New Delhi), (Summer 2009): 2.

149 Bakshi, "Kargil: Dynamics of a Limited War against a Nuclear Backdrop," 45. Of this short-sighted military leadership comportment going into Pakistan's Kargil imbroglio, the PAF's director of operations during the conflict recalled later that in an effort to keep its plan secret, "the army trio [of planners] led by Army Chief of Staff General Pervez Musharraf took no one into confidence" and presided over a "closed-loop thought process" that engendered "a string of oversights and failures," including a "failure to grasp the wider military and diplomatic ramifications of a limited tactical operation that had the potential of creating strategic effects, failure to correctly visualize the response of a powerful enemy to what was, in effect, a major blow in a disputed sector," and "failure to appreciate the inability of the [Pakistani] army officers to evaluate the capabilities and limitations of an air force." (Tufail, "Kargil 1999: The PAF's Story," 99.)

150 Qadir, "An Analysis of the Kargil Conflict 1999," 27.

151 Group Captain T. D. Joseph, IAF, *Winning India's Next War: The Role of Aerospace Power* (New Delhi: KW Publishers, 2008), 155.

152 Quoted in Singh, "Kashmir, Covert Wars, and Air Power," 86–87, emphasis added.

153 Air Commodore Arjun Subramaniam, IAF, "The Strategic Role of Air Power: An Indian Perspective on How We Need to Think, Train, and Fight in the Coming Years," *Air and Space Power Journal* (Fall 2008): 64.

154 Singh, "Kashmir, Covert Wars, and Air Power," 80.

155 Ibid., 81.

156 These points are developed in Patney, "1999 War in Kargil and Its Aftermath."

157 Air Marshal Vinod Patney, IAF (ret.), "Air Dominance: Concept and Practice," *Air Power Journal* (New Delhi), (Summer 2009): 133, 144.

158 Basrur, "The Lessons of Kargil as Learned by India," 319.

159 For the most incisive reflections to date on the many aspects of the Kargil experience as viewed from this perspective, see the chapters by Timothy Hoyt, Peter Lavoy, and Robert Jervis in Lavoy, ed., *Asymmetric Warfare in South Asia*, 144–70, 171–206, and 377–97, respectively.

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