

An hourglass-shaped graphic with a globe inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is centered in the narrow neck of the hourglass. The text is centered within the hourglass.

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Indian and Pakistani Nuclear Weapons Status

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Abstract. Until 2005, India and Pakistan were the only states outside the Nuclear Nonproliferation Treaty to declare, openly, their nuclear weapons capability. In 1998, they tested nuclear weapons and since then, deployed ballistic missiles, enunciated nuclear doctrine, and made organizational changes to their nuclear establishments. In 2002, they teetered on the brink of war in Kashmir. This paper summarizes Indian and Pakistani nuclear weapon capabilities and thinking, and discusses some confidencebuilding measures in place intended to help avert nuclear war.

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Summary

Until 2005, India and Pakistan were the only states outside the Nuclear Nonproliferation Treaty to declare, openly, their nuclear weapons capability. In 1998, they tested nuclear weapons and since then, deployed ballistic missiles, enunciated nuclear doctrine, and made organizational changes to their nuclear establishments. In 2002, they teetered on the brink of war in Kashmir. This paper summarizes Indian and Pakistani nuclear weapon capabilities and thinking, and discusses some confidence-building measures in place intended to help avert nuclear war. It will be updated as events warrant.

Background

Almost 50 years of nuclear ambiguity were swept away by the May 1998 nuclear tests of India and Pakistan. Optimists hoped that overt nuclear weapons capabilities could help provide more conventional stability and that limited nuclear arsenals might dampen competition in missile development.¹ The 1999 conflict in Kargil and 2002 crisis in Kashmir challenged this viewpoint.² South Asia remains a nuclear flashpoint, and, potentially, a source for terrorists of access to weapons of mass destruction.

Indian Nuclear Weapon Capabilities and Thinking

India began its nuclear program shortly after independence in 1947. After a humiliating defeat in a border war with China in 1962, followed by China's first nuclear test in 1964, the drive for nuclear weapons intensified. The 1974 test of a "peaceful nuclear device" was an important milestone, but it took several more years to develop a nuclear weapons capability. Simultaneously, India developed a nuclear infrastructure that supported both civilian and military purposes. For example, India's development of

¹ See Joeck, Neil, *Maintaining Nuclear Stability in South Asia*, Adelphi Paper 312, International Institute for Strategic Studies, 1997.

² Riedel, Bruce O., "American Diplomacy and the 1999 Kargil Summit at Blair House," Policy Paper Series, Center for the Advanced Study of India, University of Pennsylvania. [<http://www.sas.upenn.edu/casi>].

reprocessing capabilities supported both its use of mixed oxide fuel (plutonium and uranium) for its nuclear power plants and its plutonium-based weapons.

The size of India's nuclear stockpile has been a topic of considerable debate within scientific and defense communities.³ Estimates vary from a few to 100, but several converge on around 30-35 weapons, probably stored in component form. The U.S. Department of Defense believes that India is capable of manufacturing complete sets of components for plutonium-based weapons and has a small stockpile of such components. India "probably can deploy a few nuclear weapons within a few days to a week...and can deliver these weapons with fighter aircraft."⁴ Most agree that India is expanding its stockpile, and that if India uses unsafeguarded reactor-grade plutonium, the potential to expand its stockpile is very significant.

India's delivery capability has long reflected two very different contingencies — China and Pakistan. Because of the distances involved and India's lack of long-range bombers, capability against China inevitably required ballistic missiles. Against Pakistan, however, Indian officials recognized early on that aircraft would be more valuable, particularly in a retaliatory strike; the Indian air force is significantly more sophisticated and capable than Pakistan's.⁵ India has some 35 Mirage 2000 fighters that are nuclear-capable, although other aircraft could also be used.

Ballistic missiles add considerable instability into the security equation because they are high priority targets; the pressure to use them quickly and, for the other side, to strike them preemptively, is great. Indian officials have said short-range *Prithvi* ballistic missiles (150km and 250km ranges) are conventionally armed. While nuclear-capable and able to reach almost all of Pakistan, the use of nuclear-armed *Prithvis* could pose major risks of fallout to India.⁶ India has deployed *Agni-II* missiles with a 1500 km range and tested an 800 km range version of the *Agni* earlier this year. These solid-fueled missiles, which reportedly can be launched within minutes, considerably enhance India's ability to respond rapidly in a crisis situation.

In January 2003, the Ministry of External Affairs released to the public a short document on India's nuclear doctrine. The doctrine reiterated some of the points in the 1999 draft document on nuclear doctrine produced by the National Security Advisory Board, and refined others. In summary, the document committed India to a credible minimum deterrent, defined as: 1. a posture of "No First Use" and no use against non-nuclear weapon states, with the exception of the right to retaliate with nuclear weapons

³ The Stockholm Peace Research Institute estimated 60-120 warheads in 1995, but 25-40 warheads in 2000. The *Bulletin of Atomic Scientists* estimated 50 in 1998 but 30-35 in 2002. Estimates often calculate how much material theoretically is available, but few estimates are based on information about actual weapons. Another variable is how much material is needed per weapon; traditionally it is thought to be 25kg of highly-enriched uranium or 8kgs of plutonium, but estimates often use smaller figures. One Indian researcher estimated in May 1998 that India had fewer than 10 weapons.

⁴ U.S. Department of Defense, *Proliferation: Threat and Response*, January 2001, p. 24.

⁵ Perkovich, George, *India's Nuclear Bomb: The Impact on Global Proliferation*, (University of California Press, CA, 1999) p. 248-249.

⁶ Perkovich, *op cit.* p. 248.

against a “major attack against India, or Indian forces anywhere, by biological or chemical weapons;” 2. Civil control in the form of the Prime Minister as head of the Nuclear Command Authority; 3. Nuclear retaliation against a first strike as massive and designed to inflict unacceptable damage.⁷ The document described the Nuclear Command Authority as being composed of a Political Council (chaired by the Prime Minister and authorize the use of nuclear weapons) and an Executive Council (chaired by the National Security Advisor).

Pakistani Nuclear Weapon Capabilities and Thinking

Pakistan’s nuclear program dates back to the 1950s, but it was the humiliating loss of East Pakistan (now Bangladesh) that reportedly triggered a political decision in January 1972 (just one month later) to begin a crash nuclear weapons program. Unlike India, Pakistan focused on the uranium route to weapons. Pakistan sought technology from many sources, including China and North Korea.⁸ This extensive assistance is reported to have included, among other things, uranium enrichment technology from Europe, blueprints for a small nuclear weapon from China and missile technology from China.

Most observers estimate that Pakistan has enough nuclear material (highly enriched uranium and a small amount of plutonium) for 30 to 50 nuclear weapons.⁹ Like India, Pakistan is thought to have “a small stockpile of nuclear weapons components and can probably assemble some weapons fairly quickly.”¹⁰

Pakistan could deliver its nuclear weapons using F-16s it purchased from the United States (28 F-16 and 12 trainer aircraft; 8 are no longer in service), provided the appropriate “wiring” has been added to make them nuclear-capable. In the 1980s, Pakistan moved assiduously to acquire ballistic missile capabilities and now deploys short-range ballistic missiles and a small number of medium-range missiles. AQ Khan, former head of Khan Research Laboratories, maintained that only the medium-range *Ghauri* missiles would be usable in a nuclear exchange (given fall-out effects for Pakistan of shorter-range missiles). Other observers view the 30 to 50 *Hatf2* short-range (300km) missiles (modified Chinese M-11s) as potential delivery vehicles for nuclear weapons. *Ghauri* missiles (1350 and 2300km), which reportedly are based on the North Korean *No-Dong* and *Taepo-Dong-1*, are capable of reaching New Delhi with large payloads.¹¹

⁷ See [<http://www.idds.org/acr2003/454d1SAN03.html>]

⁸ A 1976 cooperation agreement with China greatly aided the program but Pakistan also acquired significant technology from the West in the 1980s through the present, triggering a rash of sanctions. See CRS Report RS20995, *India and Pakistan: Current U.S. Economic Sanctions*.

⁹ *SIPRI Yearbook 1995*: 5-10 warheads; *SIPRI Yearbook 2000*: 15-20 warheads. *Bulletin of Atomic Scientists*, 1998: 12 warheads. January 2002: 30 to 50. Carnegie Endowment 2002: 50-55 (Joseph Cirincione, with Jon B. Wolfsthal and Miriam Rajkumar, *Deadly Arsenals: Tracking Weapons of Mass Destruction*, Carnegie Endowment for International Peace, Washington, DC, 2002).

¹⁰ U.S. Department of Defense, *Proliferation: Threat and Response*, January 2001, p. 28.

¹¹ *Bulletin of Atomic Scientists*, January/February 2002, pp. 70-71.

Pakistan has not yet enunciated a nuclear doctrine, but it is clear that Pakistan's nuclear arsenal is seen as the key to military parity with India. Because of its fears of being overrun by larger Indian forces, Pakistan has rejected the doctrine of no-first-use. In May 2002, Pakistan's ambassador to the UN, Munir Akram, stated that "We have not said we will use nuclear weapons. We have not said we will not use nuclear weapons. We possess nuclear weapons. So does India ... We will not neutralize the deterrence by any doctrine of no first use."¹² On June 4, 2002, President Musharraf went further: "The possession of nuclear weapons by any state obviously implies they will be used under some circumstances."¹³

In recent years, Pakistan apparently has taken steps toward refining command and control of nuclear weapons. In April 1999, General Musharraf announced that the Joint Staff Headquarters would have a command and control arrangement and a secretariat, and a strategic force command would be established.¹⁴ The connection to civilian leadership was unclear, given a recent account of the 1999 Kargil incursion which suggested that Prime Minister Sharif was unaware that his own nuclear missile forces were being prepared for action.¹⁵ Pakistan established a National Command Authority (NCA) in February 2000, but little is publicly known about it. Pakistani officials have repeatedly said that their nuclear capabilities are safe. The new NCA is believed to be responsible for nuclear doctrine, as well as nuclear research and development, wartime command and control, and advice to President Musharraf about the development and employment of nuclear weapons.¹⁶

Role of Kashmir

Kashmir has been a flashpoint since Indian and Pakistani independence in 1947. Many analysts have feared that nuclear weapons could be used if conventional hostilities over Kashmir were to spiral out of control, especially if, as in 1965 Indo-Pakistan conflict, India opened a new front on the Punjab plains to break a stalemate in Pakistan or attempt to settle the issue decisively by confronting Pakistan with a mortal threat to its territorial integrity.¹⁷ Under these circumstances, some have suggested Pakistan might be tempted to detonate a small nuclear weapon on its own territory to halt forward Indian movement. Other observers, however, believe such a strategy would be akin to a state acting as a

¹² Barbara Crossette, "Pakistan Asks U.N. Council for Action on Kashmir," *New York Times*, May 30, 2002.

¹³ Laurinda Keys, "Pakistan President Says There are Circumstances For Use of Nuclear Weapons," Associated Press Newswire, June 4, 2002.

¹⁴ "Pakistan Should Respond, Says COAS," *Dawn*, April 13, 1999.

¹⁵ Riedel, *op. cit.*, p. 12. Since the military coup, there may be, ironically, less concern about civil vs. military control, but this may be an issue for future concern.

¹⁶ *Proliferation: Threat and Response*, January 2001, p. 27.

¹⁷ The war was preceded by a major tank engagement along the border with Pakistan's Sind Province in the Spring, which went in Pakistan's favor, and a subsequent war over Kashmir in August-September 1965. Pakistani troops only narrowly defeated an Indian counter-attack in the direction of Lahore, illuminating Pakistan's vulnerability.

suicide bomber.¹⁸ Some media reports have suggested that paradoxically, “the fact that both countries have very small nuclear arsenals increases the pressure on both sides to use their weapons against high-value targets.”¹⁹ Regardless of whether nuclear weapons might be used to stop war or to gain a military advantage, many observers agree that uncertainty about intentions could worsen stability.

Since 1998, both India and Pakistan appear to be integrating nuclear weapons into security strategy and planning. With the ominous logic of nuclear deterrence, each side’s desire to make its nuclear forces more credible may make those nuclear forces more usable. Ballistic missiles offer both sides advantages over using aircraft as delivery vehicles, but the short ranges create a hair-trigger situation. From launch to impact, missile flight times may be as short as 5 minutes. In the past, both sides appeared to use the separation of warhead components as a form of command and control (in the sense of lowering the risk of unauthorized or accidental use). Some observers have noted that this approach becomes risky when the other side can launch short-range ballistic missiles against which there is no defense. These observers have called for improving command and control of nuclear forces, while noting, ironically, that reduced ambiguity could conversely increase the likelihood of war.²⁰

The Defense Intelligence Agency reportedly has estimated that a nuclear exchange could kill between 9 and 12 million persons on both sides, with 2 to 6 million injured. These estimates are likely predicated on nuclear exchanges aimed at cities; e.g., Indian Defense Secretary Yogendra Narain suggested in 2002 that “India would retaliate against Pakistani aggression and that both sides should be prepared for mutual destruction.” President Musharraf’s interview in June 2002 with CNN offered respite from the nuclear rhetoric when he stated, “I don’t think either side is that irresponsible to go to that limit [i.e., nuclear conflict]. ... One shouldn’t even be discussing these things, because any sane individual cannot even think of going into this unconventional mode, whatever the pressures.”²¹

Confidence-Building Measures

India and Pakistan have a 30-year history of confidence-building measures. These include hotlines between army commanders and prime ministers, a joint India-Pakistan Military Commission (created in 1990), and agreements to provide prior notification of troop movements and ballistic missile tests. In 1991, both sides agreed not to attack

¹⁸ Salman Rushdie, “The Most Dangerous Place in the World,” *New York Times*, May 30, 2002.

¹⁹ “U.S. is Limited in Ways it Can Act To Subdue India-Pakistan Tension,” *Wall Street Journal*, June 3, 2002. “High-value targets” could be military installations, key infrastructure or cities.

²⁰ Jock, *op. cit.*, p. 50, p. 76.

²¹ [<http://www.cnn.com/2002/WORLD/asiapcf/south/06/01/musharraf.transcript/index.html>]

nuclear facilities.²² Implementation, however, has been sporadic.²³ In February 1999, the two parties concluded the Lahore Agreement. That agreement envisioned a plan for future work, to include measures to reduce the risk of unauthorized or accidental use of nuclear weapons, reviews of confidence-building measures and communications links, prior notification of ballistic missile tests, continuation of unilateral moratoria on nuclear testing, and dialogue on nuclear and security issues. The Lahore process was undermined by the summer 2001 military incursion by Pakistan in the vicinity of Kargil, but the two sides began a dialogue in 2004. In September 2004, India and Pakistan announced 13 confidence-building measures. Three security-related ones included:

- Experts' meetings on conventional and nuclear CBMs, including discussions on a draft agreement on advance notification of missile tests;
- Biannual meeting between Indian Border Security Force (BSF) and Pakistan Rangers;
- Implementation of the agreement reached between the defense secretaries in their talks in August to discuss "modalities for disengagement and redeployment" on the Siachen glacier.²⁴

Foreign secretaries reported progress in their discussions on missile notifications in December 2004.²⁵

Issues for Congress

Since the passage of the 1978 Nuclear Nonproliferation Act, Congress has been closely involved in efforts to prevent or slow the development of nuclear arsenals by India and Pakistan. In the light of the global war on terrorism, and limited Pakistani cooperation in nonproliferation, Congress might consider the following questions:

- What sources of leverage does the U.S. now have toward India and Pakistan?
- Are new sources of leverage vis-a-vis Indian and Pakistani proliferation needed? Should new leverage be focused on averting nuclear use rather than on limiting nuclear proliferation?
- Should India and Pakistan be priority recipients of cooperative threat reduction assistance? What options exist in this regard that do not undermine U.S. obligations as a party to the Nuclear Nonproliferation Treaty?
- How effective are economic or other sanctions, and which might work best?

²² Annual data exchanges on the facilities, according to some, were at first less than forthcoming. See Hibbs, Mark, "India and Pakistan Fail to Include New SWU Plants on Exchanged Lists," *Nuclear Fuel*, March 30, 1992, p. 6.

²³ The hotlines were not used to good effect either in Operation Brass Tacks in 1987 or in May 1998 around the nuclear tests.

²⁴ See [<http://www.southasiamonitor.org/diplomacy/2004/sep/8dip5.shtml>]

²⁵ See [<http://www.southasiamonitor.org/diplomacy/2004/dec/28dip1.shtml>]