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Nuclear Testing and Stability in Asia

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At 3:45 PM local time on 11 May 1998, Indian scientists conducted three nuclear tests, violating a global norm that had been honoured since 1996, when China conducted its last nuclear test. The tests culminated more than two decades of research and more than two years of secretive preparations and scientists pleading in vain for authorization from the government. The tests were finally made possible by the formation of a government led by the Bharatiya Janata Party (BJP, Indian People's Party), which had made nuclear nationalism one of its main campaign themes. These were followed by two more Indian nuclear tests on 13 May and six Pakistani tests two weeks later: five on 28 May and one on 30 May.

This paper summarizes the reasons the tests were carried out, then goes on to consider the possible implications of the tests for stability. It concludes with a brief reflection on the contrast between the Indian and Pakistani tests and China's last tests in 1996.

The immediate cause of the Indian tests was the formation of a government led by the BJP that was willing to authorize the tests that the nuclear establishment had been hoping to carry out since 1996. The Indian tests created an opportunity for Pakistani scientists to gain authorization for their own tests. Despite the apparent personal reluctance of Pakistani Prime Minister Mohammad Nawaz Sharif, the public and media outcry for tests and the military's growing fascination with nuclear deterrence as a means to compensate for conventional inferiority made it unlikely that Pakistan would not leap through the window of opportunity opened by India.

The tests might have a variety of implications for stability. Politically, the tests temporarily boosted the popularity and belligerence of the BJP, but both appear to have been short-lived. Militarily, the main effect of the tests was the effect it had on military technology transfer from Germany and the USA to India, which was immediately cut off. As a result, the foreign dependence of India's 'indigenous' military R&D programmes has been revealed. These programmes will have to be restructured or abandoned, leaving India more dependent on other arms suppliers. No clear decision on weaponization of nuclear capabilities has yet been made by either side. There are encouraging signs that India will limit the size of its arsenal and may not deploy it immediately. The situation in Pakistan is less clear, but indications are that the military continues to exaggerate the value of nuclear deterrence and may move more decisively toward weaponization of a provocative sort.

REASONS FOR THE TESTS

India and Pakistan conducted their nuclear tests for much different reasons. Authorization for India's tests was sought by the scientific establishment for reasons that may not have had much military relevance. The BJP is unusual among India's political parties in its eagerness to test and deploy nuclear weapons, and authorized the tests as a political statement to gain public support and differentiate itself. In contrast, Pakistan's political establishment is much more uniform in its enthusiasm for nuclear deterrence, as is the military, but both had been cowed from testing by the threat of sanctions, despite the perceived need to enhance the credibility of a series of deterrent

threats. India's tests provided a chance for Pakistan to test with the least risk of consequences. Prime Minister Nawaz's very public personal reluctance to test reinforced the perception on the part of some Western observers that Pakistan was less blameworthy in the wake of the tests.¹

India

Despite much speculation after the Indian tests about their possible military implications, they seem to have been conducted mainly as a scientific experiment and authorized in 1998 for political rather than security reasons.

Scientific reasons

Indian scientists had been requesting authorization to test since late 1995 at least. During a brief period in 1996 when BJP tried but failed to form a government, the party leadership authorized tests, but they were not conducted before the government fell.² No other government had been willing to authorize tests despite national opposition to the Comprehensive Test Ban Treaty (CTBT).

As seen in table 1, military, nuclear and space R&D have dominated Indian science right from the beginning.³ Indeed, the fraction of India's national on-budget R&D funding devoted military R&D was greater in 1996 than in any state other than the USA.⁴ While most of these funds are not spent on nuclear weapons and delivery systems -- indeed, funding of nuclear weapons apparently does not appear in official budget statistics -- they give an indication of the bureaucratic power enjoyed by the Big Science establishment associated with the nuclear weapon programme. Their clout was sufficient to reverse India's position in favor of the CTBT within two years, largely because of closer cooperation between Defence Research and Development Organization (DRDO) and the Department of Atomic Energy (DAE), which feared for its future if the option of testing was foreclosed.⁵

Although DRDO and DAE succeeded in convincing public opinion and a series of governments that the CTBT was not compatible with Indian security, they were not successful in gaining authorization to test before 1998. DAE sought such authorization to confirm the performance of advanced designs developed after the 1974 test and to

¹ See, for example, *Washington Post*, "A turn off the nuclear road", 31 Aug 1998, p. 20, reprinted as *International Herald Tribune*, "A choice for Pakistan", 1 Sep. 1998, p. 8.

² Joshi, M., "Nuclear shock wave", *India Today*, 25 May 1998.

³ Other major areas of scientific endeavour include, in descending order of funding in 1994/5, agriculture, industrial research, environment and forests, and science and technology. While these have also done well in recent years -- and agriculture and environment and forests were increased dramatically under the BJP-led government -- other areas have had anaemic support from the government. Chief among these are electronics and medicine, which together accounted for 2% of all government R&D funding in 1994/5. Government of India, Department of Science and Technology, Research and Development Statistics 1994-95 (The Offsetters: New Delhi, 1996).

⁴ Arnett, E., 'Military research and development', SIPRI Yearbook 1998: Armaments, Disarmament and International Security (Oxford University Press: Oxford, 1998), p. 274.

⁵ Deshingkar, G., "Indian politics and arms control: recent reversals and new reasons for optimism" in ed. E. Arnett, *Nuclear Weapons and Arms Control in South Asia after the Test Ban*, SIPRI Research Report No. 14 (Oxford University Press: Oxford, 1998).

Table 1. Expenditure on R&D by agencies of the Indian Government

Figures are in bn of current rupees, 1995 \$ mn

| Year | Defence ^a (A) | | DAE ^b (B) | | DOS ^c (C) | | Total (D) | | (A+B+C) /D (%) |
|---------|--------------------------|-----|----------------------|-----|----------------------|-----|-----------|------|-------------------|
| | Rs | \$ | Rs | \$ | Rs | \$ | Rs | \$ | |
| 1965-6 | [.12] | 41 | .20 | 69 | .. | .. | .52 | 180 | 50 |
| 1970-1 | [.22] | 55 | .29 | 73 | .. | .. | .89 | 220 | 55 |
| 1975-6 | [.52] | 75 | .54 | 78 | .37 | 53 | 2.24 | 320 | 64 |
| 1980-1 | .93 | 110 | .73 | 86 | .56 | 66 | 4.38 | 520 | 51 |
| 1981-2 | 1.21 | 130 | .88 | 92 | .75 | 79 | 5.47 | 570 | 52 |
| 1982-3 | 1.50 | 150 | 1.16 | 110 | .97 | 94 | 7.37 | 720 | 49 |
| 1983-4 | 1.97 | 170 | 1.43 | 120 | 1.10 | 95 | 8.32 | 720 | 54 |
| 1984-5 | 3.13 | 250 | 1.82 | 150 | 1.83 | 150 | 11.50 | 920 | 59 |
| 1985-6 | 3.94 | 300 | 1.43 | 110 | 2.13 | 160 | 13.35 | 1000 | 56 |
| 1986-7 | 4.92 | 340 | 1.61 | 110 | 3.10 | 220 | 15.33 | 1100 | 63 |
| 1987-8 | 6.33 | 410 | 1.79 | 110 | 3.66 | 230 | 18.08 | 1200 | 65 |
| 1988-9 | 6.80 | 400 | 2.10 | 120 | 4.22 | 250 | 20.47 | 1200 | 64 |
| 1989-90 | 7.36 | 410 | 2.50 | 140 | 3.99 | 220 | 22.07 | 1200 | 63 |
| 1990-1 | 7.99 | 410 | 2.76 | 140 | 3.86 | 200 | 23.13 | 1200 | 63 |
| 1991-2 | 8.39 | 370 | 3.06 | 140 | 4.60 | 200 | 25.55 | 1100 | 63 |
| 1992-3 | 9.54 | 380 | 3.11 | 120 | 4.99 | 200 | 27.55 | 1100 | 64 |
| 1993-4 | 12.45 | 470 | 3.76 | 140 | 6.95 | 260 | 35.33 | 1300 | 66 |
| 1994-5 | 14.93 | 510 | 4.18 | 140 | 7.57 | 260 | 39.32 | 1300 | 68 |

Source: Government of India, Department of Science and Technology.

a Defence includes R&D conducted by the Defence Research and Development Organisation and the armed services.

b Department of Atomic Energy

c Department of Space

produce data for computer models.⁶

Political

After the 1998 national elections, BJP was asked to form a government. Having failed at the task in 1996, the party leadership was desperate to succeed. Even with a very inclusive approach, however, they were not able to produce a majority government, and were forced to govern with support from parties outside their governing coalition.⁷ As a result, the BJP-led Government is doubly weak, needing to compromise and pass out favours to its coalition partners while wooing support from outside. The predictable result was paralysis, a state of affairs complicated by the political weaknesses and corruption problems of regional parties in the BJP's coalition.

Previously, some observers had predicted that the BJP would have to moderate its stance on the nuclear issue in order to govern a weak coalition with outside support.⁸ The BJP leadership instead took a much different approach from the moment they were asked to form the government. On the assumption that nuclear tests and their commitment to indigenous military technology would firm up their political support

⁶ Doordarshan Television (New Delhi), Interview with R. Chidambaram, 23 May 1998.

⁷ Such an arrangement may be inescapable for the foreseeable future in India. Deshingkar (note 5).

⁸ This is the main theme of Deshingkar (note 5).

and make other initiatives possible, they immediately offered DRDO Director General A. P. J. Abdul Kalam a cabinet post (which he declined) and told him and Atomic Energy Commission chair R. Chidambaram to prepare for nuclear tests at the earliest possible date.

Military

Military considerations were less important. Military and nuclear experts have stated that tests were not necessary for the credibility of India's nuclear capability, which is intended only to deter first use.⁹ India already had warheads and delivery systems appropriate for use against China or Pakistan, as was acknowledged by an unnamed official in the Prime Minister's Office after the tests.¹⁰ On 21 March, upon taking his post as defence minister, George Fernandes said, 'I don't think we need to test at this point'.¹¹

Pakistan

In contrast with their Indian counterparts, Pakistan's political elite is less abashed about the need for nuclear deterrence. Military fears that the Pakistani nuclear capability was not taken seriously in India combined with a feeling of growing military inferiority and abandonment to create an imperative to test that was only resisted before May 1998 because of the threat of sanctions. The Indian tests created a situation in which the Pakistani leadership saw both an even greater need to test and a possible opening to justify the test as a response that was both politically and strategically understandable.

Military

By 1998, the Pakistani military had grown very sensitive to the decline of its conventional military capabilities after US cooperation was virtually stopped by the Pressler Amendment in 1990. Between 1990 and 1996, when some US military equipment that had been paid for in the 1980s was released under a 'one-time waiver', Pakistan became dependent on Chinese arms that are far from the state of the art, while every major arms supplier (except China, which has been under pressure from the USA to reduce its military support to Pakistan) was involved in cooperation with India.¹² In

⁹ K. Sundarji, the former Chief of Army Staff, advocated signing the CTBT since -- in his judgement -- India did not need additional tests after 1974, even for a large arsenal deployed against China. Sundarji, K., "The CTBT debate: Choice before India", *Indian Express*, 4 Dec. 1995, p. 8. G. Balachandran, who is well connected in the defence ministry, wrote that a decision against testing "will not in any way worsen India's security". Balachandran, G., "CTBT & Indian security", *Times of India*, 3 Sep. 1996. Raja Ramanna, the scientist responsible for the 1974 test, is cited as saying no more tests were needed. Statesman (New Delhi), "No need for further tests", 28 Oct. 1996. An unnamed "senior scientist working with the Atomic Energy Commission" is cited to this effect in Sawhney, P., "Arjun, in its present form, is nothing more than a showpiece", *Asian Age*, 1 Feb. 1996, p. 13.

¹⁰ Burns, J. F., "India's line in the sand: 'minimum' nuclear deterrent against China", *International Herald Tribune*, 8 July 1998, p. 4.

¹¹ "N-tests ruled out", *Times of India*, 21 March 1998.

¹² In 1995, Bruce O. Riedel, the Deputy Assistant Secretary of Defense for Near Eastern and South Asian Affairs, told Congress, "US-Indian defense ties are better now than at any time in the past 30 years". US House of Representatives, Committee on International Relations, US Interests in South

Table 2. Indian and Pakistani arms imports 1972-1997
 Figures are in constant SIPRI trend-indicator \$ mn, percentages

| Year | 1972-7 | 1978-83 | 1984-9 | 1990-5 | 1996 | 1997 |
|---------------------|-------------------|--------------------|--------------------|-------------------|-------------------|-------------------|
| <i>To Pakistan:</i> | | | | | | |
| China | 683 (42) | 1776 (46) | 1491 (38) | 1906 (57) | 118 (16) | 41 (7) |
| USA | 105 (7) | 805 (21) | 2008 (51) | 217 (6) | 291 (40) | 43 (8) |
| France | 575 (36) | 881 (23) | 55 (1) | 38 (1) | 84 (12) | 76 (13) |
| UK | 57 (4) | 223 (6) | 148 (4) | 532 (16) | 0 (0) | 0 (0) |
| Other | 189 (12) | 150 (4) | 233 (6) | 670 (20) | 236 (32) | 412 (72) |
| Total | 1609 (100) | 3835 (100) | 3935 (100) | 3363 (100) | 729 (100) | 572 (100) |
| <i>To India:</i> | | | | | | |
| USSR/Russia | 6363 (75) | 8338 (82) | 15683 (76) | 5402 (72) | 970 (79) | 876 (74) |
| UK | 1190 (14) | 1532 (15) | 1603 (8) | 615 (8) | 33 (3) | 62 (5) |
| France | 138 (2) | 158 (2) | 2207 (11) | 320 (4) | 6 (0.5) | 0 (0) |
| Germany | 165 (2) | 0 (0) | 401 (2) | 399 (5) | 52 (4) | 11 (1) |
| Other | 576 (7) | 183 (2) | 803 (4) | 731 (10) | 169 (14) | 236 (20) |
| Total | 8432 (100) | 10211 (100) | 20697 (100) | 7467 (100) | 1230 (100) | 1185 (100) |

Source: SIPRI Arms Transfers databases

addition to major weapon systems, a number of inexpensive but militarily significant components and command and control technologies were ordered by or delivered to India, including laser-guided bombs, artillery-spotting radars, and reportedly an airborne warning and control (AWAC) aircraft.¹³

Pakistan's loss of its arms suppliers to India has led to a feeling of abandonment and resentment. As Asghar Khan, a retired Air Marshall said in March 1998, 'We have neither support from our friends, nor have any military equipment, or new aircraft'.¹⁴ Mohammad Sarwar Cheema, chair of the National Assembly's Standing Committee for Defence Affairs, agreed: 'The order in conventional arms ... has now been disturbed to a great extent'.¹⁵

The feeling of abandonment has reinvigorated the military's interest in nuclear deterrence of conventional war. Pakistani officials have been making statements intended to signal that their nuclear capability should make India reluctant to use conventional force. The utility of nuclear weapons as a deterrent to conventional war was specifically cited by Prime Minister Nawaz when he sought to explain his decision to authorize Pakistan's tests: 'These weapons are to deter aggression, whether nuclear

Asia (US Government Printing Office: Washington, 1997), p. 96.

¹³ Laser-guided bombs and related technology were delivered from France, Israel, Russia, the UK and the USA beginning in the early 1990s. Arnett, E., "Conventional arms transfers and nuclear stability in South Asia" in Arnett (note 5), pp. 79-81. Artillery-spotting radars were delivered from the USA in 1998. A Russo-Israeli AWAC system is apparently being developed for India.

¹⁴ Dawn, "No chance of India-Pakistan nuclear war", 22 March 1998.

¹⁵ News, 7 June 1998.

or conventional'.¹⁶ A similar view was put forward more completely by General Asad Durrani, the former director of Inter-Services Intelligence and former director of the National Defence College:¹⁷

Our deterrence is already working. ... Our aim is to prevent war, also a conventional one. ... The effectiveness of our deterrent lies in a known or a perceived capability, and in the notion that we might have a desperate propensity to use it.

Durrani specifically links Pakistan's interest in using nuclear weapons first in the early stages of a hypothetical war to Pakistan's conventional inferiority:¹⁸

Because of its known deficiencies in the conventional forces, [Pakistan is] likely to pull the nuclear trigger. ... In view of the upgraded potential that India should now be assumed to possess, we must be prepared to unleash our potential before it could be seriously impaired.

Before the 1998 tests, Indian officials had spoken and written about their doubts that Pakistan had mastered the technology of uranium enrichment. P. K. Iyengar said in 1994 that he doubted 'there is any proof that Pakistan has this capability' to make nuclear weapons.¹⁹ Raja Ramanna elaborated:²⁰

From our experience in using centrifuges to enrich uranium we know that these are difficult to maintain. And given the state of their industrial capability, it is apparent that Pakistan's plant is working nowhere to the capacity planned ... In the past, Pakistan got plenty of mileage by making tall claims. But that is now turning into paper mileage.

This scientific scepticism may have been a factor in Indian military planning. Before the 1998 tests, the Indian military may not have 'believe[d] that Pakistan has a viable deterrent', according to P. R. Chari, former Additional Secretary of Defence, the second ranking civilian responsible for the Indian Air Force.²¹ Former Chief of Army Staff General V. N. Sharma shared this view: 'I don't see any threat of nuclear capacity or capability in Pakistan'.²²

¹⁶ Pakistan Television (Islamabad), Address to the nation by Prime Minister Mohammad Nawaz Sharif (in Urdu), 28 May 1998, in FBIS-NES-98-148, insert date 29 May 1998.

¹⁷ Durrani, A., "Our friend, the enemy", *News*, 11 June 1998. Then-President Ghulam Ishaq Khan, the civilian political leader who has taken the greatest interest in Pakistan's nuclear planning, confirmed in 1990, "In the event of war with India, Pakistan would use nuclear weapons at an early stage." McDonald, H., "Destroyer of worlds", *Far East Economic Review*, 30 April 1992, p. 24.

¹⁸ Durrani, A., "Pakistan's nuclear card", *Defence Journal*, June 1998.

¹⁹ Prabhu, R., "US targeting Indian high-tech capability: P. K. Iyengar", *Indian Express*, 12 May 1994.

²⁰ Ramanna, R., "We have enough plutonium", *India Today*, 15 Sep. 1994, p. 53.

²¹ Chari, P. R., *Indo-Pak Nuclear Standoff: The Role of the United States* (Manohar: New Delhi, 1995), pp. 112-15, 127; and Chari, P. R., "Pakistan's bomb: a strategy of deterrence crafted on make believe", *Indian Express*, 28 Aug. 1994.

²² Sharma, V. N., 'It's all bluff and bluster', *Economic Times* (Bombay), 18 May 1993.

Viewed from Pakistan, the Indian military's belief that Pakistan's nuclear capability was a bluff appeared to be responsible for India continuing to emphasize its option to wage conventional war. Just before India's nuclear tests, retired Lt. Gen. V. K. Nayar told the Indian press that the army could even intentionally prolong a conventional war to achieve unspecified strategic objectives.²³

The Pakistani military therefore saw nuclear tests as indispensable for making credible their nuclear deterrent, on which they based their claim to be able to keep the nation secure.

The rampant feeling of resentment against the West and the USA in particular has made it easier for Islamists to recruit followers in the armed forces and limited the influence of US representatives who hoped to persuade Nawaz not to authorize the tests. Furthermore, the Pressler sanctions made it impossible for US President Bill Clinton to promise military aid in response for a decision not to test; he could only promise to ask the hostile US Congress to waive the sanctions.

Political

Despite pressure from the military and the opportunity opened by the Indian tests, Nawaz was apparently reluctant to authorize them. On 19 May, a week after the Indian tests, he said, 'Why we are not testing this capability is because of the fact I want to show the world that Pakistan is a responsible country. ... If India is doing it out of sheer madness, we do not have to blindly follow suit'.²⁴ With constitutional reforms passed in 1997, Nawaz was in a stronger position *vis-à-vis* the Army than any of his predecessors since the *coup d' état* that brought General Mohammad Zia ul-Haq to power in the 1980s. He could not be dismissed and, with Benazir Bhutto in legal trouble but still leading the opposition, there was no alternative outside his party, the Pakistan Muslim League-Nawaz.

Opinion polls showed the electorate supported testing, a view that was driven home to Nawaz in a meeting with prominent newspaper editors on 21 May.²⁵ In announcing his decision to the world, he exclaimed, 'Oh, God! What step are my people asking me to take?'²⁶

IMPLICATIONS FOR STABILITY

The 1998 nuclear tests may have significant direct and indirect political and military implications for stability. Some of these may be less significant than expected in the days immediately following the tests, while others may still be under-estimated. The three central questions are whether the BJP remains an ascendant political force in India, what approach India takes to compensating for the loss of military technology partners, and how India and Pakistan address the problem of weaponizing their nuclear capabilities.

²³ *Asian Age*, 2 May 1998, p. 2.

²⁴ Shaikh, S, "Pakistan not to sit back if India attacks, declares Nawaz", *News* (Islamabad), 20 May 1998.

²⁵ Husain, F., *Nation* (Islamabad), 22 May 1998.

²⁶ Pakistan Television (note 16).

The tests and BJP power

India's nuclear tests may have been intended in part to enable the BJP to govern with less resistance and to bolster the government they lead, but after 100 days leading the government -- one month after the tests -- the picture was already mixed in opinion polls. In a survey, 52 per cent thought the government had done a 'good' job in its first hundred days and 76 per cent supported the tests, but 52 per cent thought the government would not last its full five-year term without falling. Nevertheless, 59 per cent thought Prime Minister Vajpayee was a better choice for the office than Congress Party leader Sonia Gandhi, who received only 13 per cent support.²⁷

In these circumstances, it is not unimaginable that a greater portion of the Indian electorate will conclude that the BJP's difficulties in governing arise not from intrinsic problems with its agenda and methods, but with the necessity of governing with a rickety minority coalition. If so, BJP may make long-term gains from its period in government, although the net effect of the nuclear tests on these gains may be slight. If not, it nevertheless seems unlikely that the BJP will be significantly weakened. BJP's local organizations have been very effective in attracting support and introducing recruiting and indoctrination measures in areas where they govern.

It remains to be seen whether the party's positions on the conflict over Kashmir has been meaningfully moderated. War is unlikely in South Asia unless Pakistani support to the Kashmir insurgency escalates and the Indian government judges it to have crossed a threshold and chooses to use armed force in response. In 1997, neither the Pakistani provocation nor the Indian military response seemed likely.²⁸ After the BJP formed a government in March 1998, the warm relationship between the two countries created by Nawaz and the previous Indian prime minister, I. K. Gujral, quickly soured. After the Indian nuclear tests in May, Indian officials specifically linked their nuclear capability to the option of conventional war to seize the part of Kashmir on the Pakistani side of the line of control. Home Minister L. K. Advani, the BJP-led government's highest official responsible for Kashmir and one of the party's most influential figures, told the press on 19 May, 'Our policy has to be pro-active, and we cannot restrict ourselves to reactive measures'. His statement was understood to be a signal that India was willing to use military force to seize territory held by Pakistan.²⁹ At the same event, Jammu and Kashmir Chief Minister Farooq Abdullah added, 'We have to be prepared for war'.³⁰ Advani said he agreed, but was later criticized in the press for not following through.³¹

The effect of withdrawing military cooperation on India's military power

²⁷ Dasgupta, S., "100 days of just being there", *India Today*, 6 July 1998.

²⁸ Deshingkar (note 5). A highly regarded 1997 report on stability in the region from RAND identified election of a militant government in India as the greatest potential problem for stability. Tellis, A. J., *Stability in South Asia DB-185-A* (RAND: Santa Monica, Calif., 1997), p. 69.

²⁹ *Asian Age*, "Anti-India policy futile: Advani", 19 May 1998.

³⁰ *Economic Times*, "Stop fiddling in J&K, Advani tells Pakistan", 19 May 1998.

³¹ Mitra, S., and Vinyak, R., "L. K. Advani: Whatever happened to Mr Tough?", *India Today*, 17 Aug. 1998.

Among other international responses to India's tests, Germany and the USA stopped their technical cooperation on military projects. Although the projects being pursued by the DRDO were funded in part to make India less vulnerable to disruptions in relationships with unreliable suppliers, most of the major projects were discovered to be dependent on foreign cooperation. US firms were supplying technology to the Light Combat Aircraft, the Advanced Light Helicopter (ALH) and Bharat Electronics Ltd, which is involved in DRDO-designed missiles. German firms supplied technology for the ALH and Arjun tank. These projects will have to be taken up by French, Israeli and Russian suppliers or replaced by importing complete systems.³² India and Russia negotiated a new ten-year arms supply arrangement, worth some \$8 billion, after the tests.³³

Although the BJP-led government increased India's military R&D budget by 30 per cent to a purchasing-power level higher than any non-nuclear weapon state, it is unlikely that more money alone would have allowed India to deploy the vast array of systems said to be in development, even if technology transfer had not been interrupted by the tests. Since economic liberalization began in the early 1990s, government organizations like DRDO are seen as undesirable and unprofitable employers, in good measure because of their inability to bring major system designs to fruition. These problems will be all the worse if Germany and the USA are successful in encouraging other suppliers to join them in embargoing India.

On the other hand, India's military capability would probably increase if the disruption of technology transfer to its ostensibly indigenous programmes led to the purchase of superior systems from abroad. Major systems will have to be imported in any case because of delays created by the German and US embargoes, but the increases in military R&D funding make it difficult to pay for imported weapons.

WEAPONIZATION?

Both India and Pakistan expressed determination to press ahead with the weaponization and deployment of their nuclear capabilities after the tests. On the Indian side, there has been a vigorous public discussion and it appears that weaponization may be kept modest and deployment will not necessarily happen in the immediate future. In Pakistan, there are fewer public indications of the course to be followed, but there is evidence of a crisis mentality in which nuclear weapons might soon be deployed in provocative ways.

India

India's nuclear capability is apparently intended to dissuade Pakistan from using nuclear weapons first while preserving India's option to use conventional forces in response to, say, an increase in Pakistani support to Kashmiri insurgents.³⁴ In principle, relatively

³² France is supplying India with avionics for its Russian Su-30 attack aircraft. Israeli firms have supplied India with smart-bomb technology and technical assistance with the T-80 Fast Attack Craft, and one is reported to be supplying the radar for an airborne warning and control system (AWACS). Laskar, R. H., "Navy built vessel with Israeli help", *Asian Age*, 24 June 1998.

³³ *Pioneer*, "Pact with Russia on defence needs", 23 June 1998.

³⁴ Indian officials were quick to articulate a no-first-use position after the tests, even as they

few nuclear weapons would be needed for this posture. Defence Minister Fernandes said after the tests that the nuclear arsenal would not cost more than Rs 200 billion, about \$5 billion equivalent foreign exchange or \$20 billion equivalent purchasing power.³⁵

The number and type of weapons to be deployed will be decided after the conclusion of the Strategic Defense Review, which in turn awaits the formation of a National Security Council. The council's membership is to be based on the recommendations of retired Air Commodore Jasjit Singh and former Minister of Defense K. C. Pant. Singh wrote after the tests that India should develop a triad of roughly three dozen weapons over 15 to 20 years, reserving the decision to deploy them until its security situation demanded. Tactical nuclear weapons would not be necessary. The Air Force would 'retain' the primary responsibility for nuclear delivery, with ballistic missiles and sea-based weapons being deployed later if necessary.³⁶ Previously, military officials had expressed scepticism about the utility of ballistic missiles for nuclear missions: 'We could probably get better results with a water buffalo cart'.³⁷

Pakistan

Since Pakistan's ability to produce nuclear weapons was made clear publicly in 1990, it has generally been assumed that they could be delivered by aircraft.³⁸ Since Pakistan fears losing air superiority to India relatively early in a war -- a loss that would make its air bases vulnerable to heavier and more accurate bombardment from the air -- and seeks the flexibility to use nuclear weapons first against military targets, short-range ballistic missiles (SRBMs) have a definite military appeal.³⁹ Pakistan received SRBMs from China in the early 1990s.⁴⁰ A. Q. Khan stated that the May 1998 tests included warheads for SRBMs.⁴¹

reiterated their willingness to use military force. See for example, the remarks of Home Minister Advani in *Times of India*, "Pakistan to roll back anti-India policy", 19 May 1998. See also *Hindu*, "India declares moratorium on nuclear testing", 22 May 1998. Prime Minister Vajpayee has also said that India's nuclear arsenal "should prevent the use of these weapons". Cooper, K. J., "Leader says India has a 'credible' deterrent", *Washington Post*, 17 June 1998, p. A21.

³⁵ *Asian Age*, "5 Pak tests doubtful: George", 1 June 1998. See also *Times of India*, "Tests are nowhere near India's: Fernandes", 1 June 1998.

³⁶ Aneja, A., "Defence institute chief for small nuclear arsenal", *Hindu*, 20 July 1998; and Singh, J., "Defence: Budgeting for security needs", *Frontline*, 18-31 July 1998. See also Singh's remarks in Cooper, K. J., "Nuclear dilemmas: vital issues face India as a nuclear power", *Washington Post*, 25 May 1998, p. A1.

³⁷ Mann, P., "Washington outlook: You're kidding", *Aviation Week and Space Technology*, 13 June 1994, p. 21.

³⁸ Former Pakistani Chief of Army Staff General Mirza Aslam Beg said in 1998 that the ability to deliver nuclear weapons by aircraft was achieved late in 1990, several months after the Kashmir crisis of the previous spring. A. Rashid and S. Sidhva, "Might and menace", *Far East Economic Review*, 4 June 1998, p. 34.

³⁹ Arnett (note 13).

⁴⁰ Arnett, E., "Military research and development in southern Asia: limited capabilities despite impressive resources" in ed. E. Arnett, *Military Capacity and the Risk of War: China, India, Pakistan and Iran* (Oxford University Press: Oxford, 1997), pp. 268-71. First deliveries may have been as early as 1988.

⁴¹ Iqbal, A., "Pakistan can explode H-bomb: A. Q. Khan", *News*, 30 May 1998.

Pakistan has also sought to develop or acquire longer-range ballistic missiles. The Hatf III project for a 600-800 km ballistic missile was launched in 1987.⁴² On 6 April 1998, Pakistan flight-tested a new, longer-range missile designated Hatf V or Ghauri. The nominal range given for the Ghauri is 1500 km with a payload of 700 kg, but the range demonstrated in the test was 1100 km.⁴³ Then-Foreign Minister Gohar Ayub Khan confirmed that the Ghauri was intended to be a nuclear delivery system.⁴⁴

A. Q. Khan suggested that a decision test weapons without deploying them might be a distinction without a difference: 'We can deploy [nuclear weapons] within days'.⁴⁵ Nevertheless, Foreign Secretary Shamshad Ahmed said, 'We do not wish to engage in nuclear arms race and do not want to embark on a weaponisation programme or one that involves deployment of nuclear warheads on our missiles'.⁴⁶

CONCLUSION

The net effect of the 1998 nuclear tests has been to aggravate a difficult situation. The tests underlined the BJP's belligerent approach to foreign policy, reinvigorated the Pakistani enthusiasm for nuclear deterrence, and opened the door for Pakistan to move quickly in the direction of provocative nuclear deployment, an activity that might not be easily observed by other governments. While nuclear war is not inevitable, the implications of the tests for stability are mainly negative. In contrast, China's last tests were undertaken with the understanding that they would make observance of the global norm against testing possible. More importantly, China's decision to stop testing and sign the CTBT came over the objections of the military in the midst of a nuclear modernization effort. In this sense, the decision was doubly encouraging: it not only averted potentially destabilizing modernization, it demonstrated to concerned observers that the Chinese government cares more about reassuring the international community than the military's preference for nuclear modernization. Indeed, no nuclear modernization programme was affected as much as China's, and no other state did as much to reassure others about its intentions by signing the CTBT.

⁴² Muslim, 'Hataf-III is superior to Prithvi: Beg', 5 July 1997. The designations Hatf I and Hatf II refer to Pakistan's SRBMs.

⁴³ A. R. Koch and W. P. S. Sidhu, "South Asia goes ballistic, then nuclear", *Jane's Intelligence Review*, June 1998, p. 36.

⁴⁴ "Pak declares self a n-weapons state", 30 May 1998.

⁴⁵ Hussain, Z., "Interview, A. Q. Khan", *Newsline* (Karachi), June 1998.

⁴⁶ Sehbai, S., "Pakistan reassessing position on CTBT", *Dawn*, 1 July 1998.