Ever since the 1998 nuclear tests, and indeed even well prior to that, India has been in the process of “modernizing” its nuclear arsenal, and more generally its military capabilities. The main focus of modernization in terms of its nuclear arsenal has been on increasing the diversity, range and sophistication of ways of delivering weapons. There has also been a wide ranging research effort that the government has sought to keep unconstrained.\(^1\) Though we do not explore the subject here in any detail, over the last decade, there has been a growing ballistic missile defence program that seeks to deploy a multi-layered system to intercept incoming attacks.

Much of the information in this chapter is based on independent estimates. There is little information available from India’s government on most nuclear weapon matters except at the most general level. The one exception is in the case of ballistic missiles, where every (successful) test launch is much lauded as a mark of the country’s prowess in destructive ability, with statements extolling the multiple characteristics of the missile, such as its accuracy, range, and the payload it can carry.

**STATUS OF INDIA’S NUCLEAR FORCES**

India’s nuclear weapons programme first became public knowledge in 1974 when it conducted a nuclear weapon test at the Pokharan site, not far from the border with Pakistan. It followed this test 24 years later in May 1998 with five nuclear explosions again at Pokharan, albeit with planned attempts in the early 1980s and 1995 to conduct nuclear tests.\(^2\) Much of what is known about the designs of the nuclear weapons in India’s arsenal comes from official statements in the immediate aftermath of the 1998 tests.

An official press release from 17 May 1998 put out by the Department of Atomic Energy (DAE) and the Defence Research and Development Organization (DRDO) stated that the nuclear establishment had carried out “design and development of various kinds of nuclear explosives, e.g. fission, boosted fission, thermonuclear and low yield” and tried to ensure “long shelf life of device components and optimisation of the yield-to-weight ratio.”\(^3\) In other words, officially, there were four different designs tested: a regular fission design, a thermonuclear (hydrogen bomb) design, a boosted fission design that served as the primary explosive to produce the radiation that compresses the secondary (fusion) part of the two-stage thermonuclear weapon, and a design that produces a relatively low explosive yield. In practice, however, it is likely that only one or two of these have been incorporated as weapons in the arsenal. Various heads of the DAE have maintained that the 1998 tests have given India “the capability to build fission and thermonuclear weapons with yields up to 200 kt.”\(^4\)

The most likely design to have been weaponized is the fission one, which was a more sophisticated and light-weight version of the design tested in 1974. Indeed, in a subsequent public talk in New Delhi in 2000, then Indian Atomic Energy Commission (AEC) chairman R. Chidambaram said, “The 15 kiloton device was a weapon which had been in the stockpile for several years.”\(^5\) He termed the others “weaponisable configurations” which had to be “converted into a weapon”. There is no official confirmation of whether this conversion has subsequently occurred, though one expects, going by past history,\(^6\) that the teams of scientists and engineers involved in designing the Pokharan explosions have been working on this and related tasks.

The 17 May 1998 press release also declared that the three “tests conducted on 11 May, 1998 were with a fission device with a yield of about 12 kT, a thermonuclear device with a yield of about 43 kT and a sub-kiloton device.”\(^8\) These yield estimates have been contested; based on seismic signals detected around the world, international seismologists suggested that the total yield was only 16–30 kilotons.\(^9\) Scientists and engineers from the DAE published a number of papers arguing for their version of the yields.\(^10\) Though there was no real resolution of this debate over the success of the tests, it seemed likely that some of the designs may not have worked.

Further evidence for the failure of one of the designs came in 2009 when one of the senior members of the DRDO, K. Santhanam, revealed that the yield of the “thermonuclear device test was much lower than what was claimed” so as to offer a reason for asserting “that India should not rush into signing the CTBT [Comprehensive Test Ban Treaty].”\(^11\) Eager to establish their credibility, the former and current heads of the DAE argued that Santhanam’s analysis and the “doubts” he had expressed about the 1998 tests had “no scientific basis”.\(^12\)
But their arguments were essentially a reiteration of their earlier claims with no new data offered in support. There is also considerable uncertainty about the low yield devices tested in 1998. First, seismic evidence suggests that these did not explode with the claimed yields. Again, DAE scientists tried to contest this by publishing papers, but these suffered from serious scientific flaws and were hardly convincing. Second, and perhaps more important, is the question of whether Indian nuclear planners envision developing and deploying tactical nuclear weapons with low yield. Officially, the low-yield devices that were tested in 1998 had “all the features needed for integration with delivery vehicles” and were for “developing low-yield weapons and of validating new weapon-related ideas and subsystems.” However, there is little evidence of India including, or desiring to include, tactical weapons with low-yield in its nuclear arsenal. Indeed, strategic analysts have argued that the “Indian nuclear arsenal does not need tactical nuclear weapons—and never will.”

Another possibility that was suggested by some analysts was that this involved the use of reactor-grade plutonium. The implications of this possibility are discussed below.

Finally, the 17 May 1998 press release also declared that the tests “significantly enhanced our capability in computer simulations of new designs and taken us to the stage of sub-critical experiments in the future, if considered necessary.” In 2009, DAE leaders again reiterated that there was “no need for so many tests” because of the increase in scientific knowledge and advancements in computer technology. Regardless of the veracity of these claims, the statement implies the desire, if not the actual ability, for using computer-based capabilities for refinements in weapons design.

**Delivery systems**

The primary focus of efforts at furthering India’s nuclear arsenal has been on developing delivery vehicles for the weapons designed and tested by DAE. In fact, because there is so little public discussion on the nuclear weapons themselves, the frequent testing of a diverse array of ballistic missiles, of increasingly longer range, is the most visible reminder of India’s growing nuclear capability. India has also developed or otherwise acquired components of an early warning system and an anti-ballistic missile (ABM) defence system.

Dating back to 2003, India’s official nuclear doctrine is very brief and gives little detail on what it envisions for its nuclear arsenal. However, a few years earlier, the National Security Advisory Board released a draft report on a nuclear doctrine (DND) for India that is far more detailed. Even though this document does not have official stature, the subsequent development of India’s nuclear arsenal has followed the broad elements laid out in the DND. The DND calls for India’s nuclear forces to be deployed on a triad of delivery vehicles of “aircraft, mobile land-based missiles and sea-based assets” that are structured for “punitive retaliation” so as to “inflict damage unacceptable to the aggressor”. This triad now comprises land-based missiles and missiles that can be fired from sea, including from submarines, and aircraft capable of carrying and dropping nuclear bombs.

The main land based nuclear delivery system is the Agni series of missiles. Work on the Agni started as part of the Integrated Guided Missile Development Programme in 1983, but the missile has been substantially redesigned since the 1998 nuclear tests. The most recent of the series, tested successfully in November 2011, is the 3500 kilometer (km) range, two-stage Agni-4 missile that is capable of carrying a payload of 1000 kg, sufficient for a nuclear warhead. The Agni-3 also had a range of 3500 km and was tested in June 2006, April 2007, May 2008, and February 2010. The Agni-2 missile with a range of 2000 to 2500 km has been flight-tested a number of times, the most recent of which was in October 2011. Likewise, the 700 km range Agni-I has been tested several times, most recently in December 2011. Finally, with a much smaller range of 150 km is the nuclear-capable Prithvi-1 missile, which has also been tested numerous times. Defence officials and media commentators routinely describe other missiles such as the Prithvi-2 and Prithvi-3 (Dhanush) as nuclear-capable, but it is not clear if these are really intended as nuclear delivery vehicles.

The Prithvi-I, Agni-1, and Agni-2 have been inducted into the military. The International Institute for Strategic Studies estimates that the military posses about 80 to 100 Agni-1 missiles and 20–25 Agni-2 missiles, and up to about 20 Prithvi-1 missiles. These numbers are much higher than the estimates for nuclear warheads because all of these are intended as capable of carrying both conventional and nuclear payloads.

Though it is clear that the Indian Air Force does have aircraft that it plans to use in nuclear strike missions, there is some dispute over which aircraft it would use. For example, the 2010 Nuclear Notebook of the Bulletin of the Atomic Scientists lists the Mirage 2000-H, the Jaguar IS/IB, and possibly the MIG-27 as likely contenders. Many media commentators mention the Russian Sukhoi-30 MKI planes as one that can be rigged to carry nuclear weapons. US strategic analyst Ashley Tellis, on the other hand, has argued that the Russian airplanes may not be well suited to the nuclear delivery role and has suggested that the Jaguar and the...
Mirage 2000 are the most likely aircraft to be used to drop nuclear weapons.33

The Navy’s part of the triad revolves around the nuclear submarine that India has been developing for over three decades, reportedly with some limited Russian help.34 By the late 1990s, a design for the reactor of this submarine was finalized. Testing of a prototype reactor commenced at Kalpakkam in southern India somewhere around 2000–2001.35 The submarine, named Arihant, was launched in 2009.36 A second nuclear submarine named Aridaman is reportedly under construction and construction of a third, as yet unnamed, submarine is in the early stages.37

In December 2010, the Chief of the Navy stated that India would soon have an operational triad of aircraft, land-based missiles, and (nuclear-powered) submarine-launched missiles for delivery of nuclear warheads, and offered late-2011 or early-2012 as the date for operationalization of the Arihant.38 However, in January 2012, it was reported that the submarine is going to undergo the crucial sea acceptance trials in February of the year to be followed by weapon trials and that the submarine will likely be formally inducted into the Navy “hopefully in 2013”39

In addition to the domestic submarine, the Indian Navy has also leased a Nerpa class nuclear submarine from Russia so as to gain experience in operating such platforms.40 The lease is for a period of ten years and the contract is said to be worth over $900 million.41 The leased submarine is expected to be armed with 300 km range cruise missiles with conventional warheads but the Navy will use it “to train its sailors in the complex art of operating nuclear submarines”.42

The Arihant is likely to use the Sagarika, also called the K-15, with a range of 700 km as the submarine-launched ballistic missile to deliver nuclear weapons. The first four launches of the Sagarika were kept a secret; only the successful fifth test in February 2008 was publicly announced.43 A subsequent test was carried out in November 2009.

There are also plans to modernize or otherwise further advance delivery systems. The two main foci are the development and deployment of longer range missiles and fully inducting the nuclear submarine into active service. As mentioned earlier, the nuclear submarine is expected to be operationalized shortly. The head of the DRDO, V. K. Saraswat, announced in February 2010 that India would conduct a test of a 5000 km Agni-5 missile “within a year”.44 In May 2011, it was reported that Prime Minister Manmohan Singh took stock of the country’s nuclear arsenal, with discussions focusing on the status of the 5000 km range Agni-5 missile that is under development, and the Arihant submarine.45

Fissile materials

There are no official estimates of the size of India’s stockpile of fissile materials; unofficial estimates have considerable uncertainties. It is known though that India produces both highly enriched uranium (HEU) and weapon-grade plutonium. The HEU is believed to be of an enrichment level that is considerably lower than the level used in weapons deployed by countries like Russia and the United States and intended only to fuel the nuclear submarine fleet that India is building. For use in the explosive cores of nuclear weapons, India chose early on to use plutonium because HEU was believed to be more expensive and difficult to produce.

India has historically produced weapon-grade plutonium at its two production reactors, CIRUS and Dhruva, both at the Bhabha Atomic Research Centre (BARC), in Mumbai.46 BARC is the primary location where most of the nuclear weapons work in the country is carried out. Besides the reactors, the Trombay reprocessing plant, where plutonium is extracted from the spent fuel generated by these production reactors, is also located in BARC.47 Metallurgical activities involving plutonium are also carried out in the same complex.48

Of the production reactors at BARC, the 40 MWt CIRUS reactor, which began operating in 1963, was shut down in December 2010. On the basis of assumed capacity factors, India is estimated to have a stockpile as of the end of 2011 of weapon-grade plutonium of 0.52 ± 0.17 tons.49 Of this, about 0.09 tons may have been consumed in nuclear weapons tests and in the first core of the Fast Breeder Test Reactor. The remaining stockpile of weapon-grade plutonium should suffice to produce about 90 warheads.

There is also the possibility of using reactor-grade plutonium to make nuclear weapons. While there is no official confirmation of this possibility, there has been ample speculation that one of the devices tested in 1998 used reactor-grade plutonium.50 If this is the case, then the nuclear arsenal could potentially be much larger. The estimated stockpile of separated plutonium from power reactors is 3.8 to 4.6 tons.51 Assuming that about 8 kilograms of the material is required for a weapon, this stockpile could be used to make 475 to 575 weapons.

Officially, however, this stockpile of reactor-grade plutonium is intended for use as fuel for India’s planned fast breeder reactor programme.52 The official Indian doctrine calls for a “credible minimum deterrent” and although there has always been deliberate official ambiguity about what minimum means, the doctrine is usually interpreted as not calling for a very large arsenal, certainly not in the range of 500 weapons. There is thus no strong reason to assume that the reactor-grade plutonium will be used to make weapons. At the same time, this stockpile has been a reason for Pakistan to maintain that it needs to expand its fissile material stockpile significantly and block progress on the fissile material cut-off treaty at the Conference on Disarmament.53
The fast breeder programme, however, provides another potential source of producing weapon-grade plutonium. During the negotiations and public debates surrounding the nuclear deal that was negotiated with the United States, however, the DAE strenuously kept the Prototype Fast Breeder Reactor (PFBR) being constructed at Kalpakkam in southern India as well as eight other electricity production reactors outside of international safeguards. The PFBR can produce about 144 kilograms (kg) of weapon-grade plutonium every year if it operates at 75% efficiency. This is sufficient for fabricating nearly 30 weapons every year and would represent a major increase in weapons production capacity.

India has also produced HEU to fuel its nuclear submarine propulsion program at its Rare Materials Plant in Rattehalli, Mysore (Karnataka). The HEU is said to be between 30 and 45% of uranium-235, much less than weapon-grade. Assuming an enrichment level of 30%, India is estimated to have had a stockpile of 2.0 ± 0.8 tons of highly enriched uranium as of the end of 2011. There are at least some publicly known bases for estimating stockpiles of fissile materials. These include characteristics such as power levels of nuclear reactors and procurement records of equipment for making uranium centrifuges. This estimate provides an upper estimate of the number of weapons that could be manufactured from this stockpile. But there is almost no public information available to make knowledgeable guesses about how much of this stockpile has actually been converted into weapons.

In 2010, the Nuclear Notebook of the Bulletin of the Atomic Scientists estimated that India has 60 to 80 assembled nuclear warheads, with only about 50 fully operational. The 2011 yearbook from the Stockholm International Peace Research Institute estimated that as of January 2011, India had 80–100 nuclear warheads.

The Nuclear Weapons Complex

For some time now, there have been plans to expand the nuclear weapons and missile production complex. The nuclear establishment is in the process of building a new complex in the city of Vishakhapatnam, which will be larger than the existing BARC complex. It will host a plutonium production reactor that is to come up in the “2017–18 timeframe.”

The capacity to enrich uranium is also being enhanced. In addition to the existing Rattehalli complex, which is undergoing an expansion, there are also plans for a second uranium enrichment facility, the “Special Material Enrichment Facility,” in Chitradurga district in Karnataka. According to the Chairman of the Atomic Energy Commission, this facility will not be safeguarded and India is “keeping the option open of using it for multiple roles.” However, because the existing enrichment capacity is already sufficient for the nuclear submarine fleet that India is building, it is possible that this facility is used to produce low enriched uranium for power reactors.

The missile production complex is also undergoing expansion. The public sector company that manufactures the Agni and Prithvi missiles, in addition to a number of other missiles, is reported to be planning to invest Rs. 40 billion (approximately $0.8 billion) to open five new manufacturing units. In 2006–2007, the company first managed to produce 15 Prithvi missiles. Currently, the company is believed to produce 20 missiles every year. Plans to step up production of the Agni ballistic missiles were reportedly “in the pipeline” in 2007. The increased production rate was partly a result of opening up missile production to the private sector; “The private industry has emerged as a co-developer of the sub-systems of the missiles, which is helping us in cutting down development time,” according to DRDO head Saraswat.

The Role of the United States

India has relied extensively on other countries to further its modernization programmes. In recent years, its modernization efforts were supported enthusiastically by the United States, especially under President George W. Bush. As part of its effort to contain China, the Bush administration sought to aid Indian capabilities in a variety of ways, especially after the two countries entered into a broad agreement in January 2004. Termed the “Next Steps in Strategic Partnership” (NSSP) initiative, the 2004 agreement stated that the United States would provide India with access to aid, information, and technology [euphemistically termed “increased cooperation”] in civilian nuclear activities, civilian space programmes, and high-technology trade, as well as on missile defence. The purpose of this agreement was made clear by a US official who said the United States’ goal is to help India become a major world power in the 21st century. We understand fully the implications, including military implications, of that statement.

The most prominent agreement that followed NSSP was what became dubbed the US-India nuclear deal, the effort to get the Nuclear Suppliers Group to waive its usual requirements when exporting nuclear technology to India. Though ostensibly about civilian
nuclear energy, the debates underlying the US-India nuclear deal were all about whether or not India would gain or lose nuclear weapon capabilities. But gains to India’s military capabilities were desirable to the Bush administration. As Ashley Tellis, who was advisor to the US ambassador to India during those years, put it: “If the United States is serious about advancing its geo-political objectives in Asia, it would almost by definition help New Delhi develop strategic capabilities such that India’s nuclear weaponry and associated delivery systems could deter against the growing and utterly more capable nuclear forces Beijing is likely to possess by 2025.”71

The Indian elite largely shares this view of China being a great rival and a competitor not just for the domination of Asia, but also for the increasingly scarce resources, raw materials, and fuels needed to power the rapid economic growth in the two countries. Among the resources that have been often discussed in the media is water.72 Competition between the countries over resources has also received some attention from academics. Some are concerned that this competition would bring it into conflict with China.74

When added to the decades-old border dispute between the two countries, it provides Indian military planners a good justification, at least in the eyes of the elite, for an increased build-up in both conventional and high tech arenas. Typical of this strain of thinking was the 10 August 2009 speech of the outgoing chief of the Indian Navy, who said that coping with China will certainly be one of our primary challenges in the years ahead... China’s known propensity for ‘intervention in space’ and ‘cyber-warfare’ would also be major planning considerations in our strategic and operational thinking... On the military front, our strategy to deal with China must include reducing the military gap and countering the growing Chinese footprint in the Indian Ocean Region. The traditional or ‘attritionist’ approach of matching ‘Division for Division’ must give way to harnessing modern technology for developing high situational awareness and creating a reliable stand-off deterrent.75

The effort to bring the United States and India closer militarily has persisted under President Barack Obama as well. As US ambassador to India, Timothy Roemer, noted in a speech in New Delhi in April 2011, “On security, defense, and intelligence, our cooperation has taken off since the signing of the Counterterrorism Cooperation Initiative, which I signed in July 2010.”76 Speaking of the sales of C-130 aircraft, Roemer argued that the “sales strengthen the strategic partnership between our two countries, and demonstrate our enduring commitment to sharing the world’s best technology with India.”77

ECONOMICS AND POLITICAL ECONOMY

The expansion of India’s nuclear and missile arsenals are part of a larger military build-up since the tests. Contrary to claims by nuclear weapon advocates that building nuclear weapons would reduce conventional military expenditure, actual figures have been consistently increasing. As a fraction of gross domestic product (GDP), this has ranged from 2.3 to 3 percent, despite the significant increases in GDP that the country has witnessed over the decade.

As a result of the rapid pace of India’s military modernization and the inability of the domestic industry to supply the necessary equipment, India was the world’s largest recipient of major conventional weapons over the period 2006–10.80

Many of these “conventional” weapons are aimed at modernization of military capabilities. This effort has primarily focused on technology, its acquisition and its implementation in military capabilities and planning. The Indian Navy, for example, has been investing in “electronic intelligence” and other electronic warfare systems, seeking to spend half a billion dollars in this effort.83

These expenditures have gone largely unquestioned. There is little public or political debate on defence spending. Indeed it has been observed that in India “the defence budget has at times been approved by Parliament without a debate.”85

Historically, the nuclear and defence research establishments, which have been aptly termed a ‘Strategic Enclave’ by scholar Itty Abraham,84 have wielded considerable social, political, and economic power. The enclave has significantly influenced national policy on a variety of issues and greatly shaped the nature of India’s nuclear arsenal.85

In recent decades, this enclave has been joined by a variety of other players, including government labora-

| Table 1: Military expenditure (local currency, current prices for calendar years) |
|-----------------------------------|---|---|---|---|---|---|---|---|---|
| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| Military expenditure (bn Rs) | 703 | 722 | 774 | 964 | 1025 | 1091 | 1182 | 1475 | 1820 |
| Military expenditure (bn constant 2009 US $) | 22.6 | 22.5 | 23.0 | 26.7 | 28.2 | 28.4 | 28.8 | 32.1 | 35.8 |

Source: Stockholm International Peace Research Institute86
Discourse

Since 1998, nuclear advocates have been striving to make India's nuclear arsenal seem both a natural acquisition and a source of pride. Perhaps this mixture is best seen in the first full-length official statement after the 1998 tests presented by Prime Minister A. B. Vajpayee to the Indian parliament. Entitled "The Evolution of India's Nuclear Policy," the paper states that India is a "Nuclear Weapons State" and this status is "India's due" and "the right of one-sixth of humanity." Thus, the possession of nuclear weapons is portrayed as giving its possessor a special status, implicitly that of a great power, but that very status is a natural one for India to possess.

Over the years, the idea that India has the right to these weapons, and that it should have ability to possess and make more of these weapons, has become widely shared, across much of the political spectrum. This shared belief was made clear during the course of the very contentious and long-drawn debate over the US-India nuclear deal, when both the government and the main party in opposition, the Bharatiya Janata Party, differed primarily over whether going through with the deal—particularly the proposed separation of civilian and nuclear facilities—would make more difficult the creation of a large nuclear arsenal, but expressed no doubts about the desirability of such a large arsenal.

The arguments for acquiring nuclear weapons have also changed over the last two decades. During the early to mid-nineties, one oft heard argument from those espousing nuclear weapons in India was that while these were evil, they were a necessary evil. Today, it is common to see an unabated enthusiasm for the development of a full-fledged arsenal so that India can become a bonafide nuclear weapon power that can exercise its military might at least across the Indian Ocean and South Asian regions, if not the world at large.

The nuclear establishment and the media have also frequently catered to what historian Vinay Lal identifies as the national obsession for records. Records, especially those that measure the nation-state's achievements in comparison to other countries, are particularly important to the Indian elite. "It is the political and economic elite in India who reminds us that India stands third in the strength of its scientific manpower, that it is a member of the 'Nuclear Club', that its software engineers have conquered (so to speak) the heights of Silicon Valley, and that it is only Third World nation to join a few of the post-industrial countries as an exporter..."
of satellite and rocket technology."97 Thus, for example, the Indian navy leasing a nuclear submarine from Russia was announced in the *Times of India*, a widely circulated newspaper, with the storyline "India becomes 6th nation to join elite nuclear submarine club".98

As in many other countries, scientists and engineers involved in the nuclear and missile development efforts have been feted. The most prominent of these was Abdul Kalam, who was awarded the Bharat Ratna, the highest civilian honor, and became the president of the country. Kalam, a mild mannered engineer,99 was immensely popular, especially among the elite and his appointment is representative of the way they (the Indian elite) view nuclear weapons, missiles, and other accouterments of military power. For the elite, Kalam symbolized, in the words of a prominent media commentator, "the hopes and ambitions of an emerging India, a new age guru for a new India."100

One notable characteristic of Kalam has been his abiding faith in the military-industrial complex as the motor of progress.101 In his numerous addresses to audiences ranging from school children to elite policy makers as well as his prolific writings, Kalam often extolled the importance of various military and nuclear technologies for broader development, to make India what he calls a "developed nation".102 Such identification is deeply appealing to elite Indians because it provides an easy way to deflect the standard "guns versus butter" arguments that are not surprisingly often invoked in a country like India with a large poor population.

The effort to publicly extol participants in the nuclear and missile enterprises includes not just the top leaders of the DAE and the DRDO, but also lower-level officials. A good example of the effort to make prominent such officials is the case of Tessy Thomas, the leader of the team that oversaw the development of Agni IV. In her case, the press made much of her being a woman overcoming the "glass ceiling" and breaking "gender barriers in the decidedly male preserve of strategic weapons and nuclear-capable ballistic missiles."103 While these barriers are real and Thomas must have had to perform extremely well in order to be promoted to her position, the effect of this praise is to make the development of nuclear-capable missiles a goal to be aspired to for women as well.

**INTERNATIONAL LAW**

The shift in discourse in India's official positions on nuclear weapons is also apparent with regard to international law.

Ever since the 1974 nuclear test, the Indian government's focus in arms control diplomacy has been to resist signing onto any international treaties that impose any obligations on its nuclear arsenal. This allows the government to maintain that it is a responsible member of the international community because it has not breached any agreement. Indeed, in a press statement from 18 May 1998, Jaswant Singh, a senior government official and a key strategist for the Bharatiya Janata Party, stressed precisely this when he said, "In undertaking these tests, India has not violated any international treaty obligations."104 Since then India has held fast to the position that even though it has a moratorium on nuclear tests, it will not sign the Comprehensive Test Ban Treaty. Neither has it agreed to a freeze on fissile material production pending the negotiation of a fissile material treaty. There are thus no legal constraints on any modernization activities that may affect the quantity or quality of its nuclear weapons.

Yet, its activities may not be in complete concordance with international law. In 1996, the International Court of Justice (ICJ) offered an historic Advisory Opinion where it ruled that "the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of international humanitarian law" and endorsed unanimously a legal obligation on all states “to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control”.105 The ICJ maintained that the obligation for disarmament is not restricted to signatories of the nuclear Non-Proliferation Treaty (see the chapter on international law for further details).

Earlier, as the case was being considered, India submitted a memorial that stands in blatant contrast to the positions Indian officials have maintained since the 1998 nuclear weapon tests. To better understand the contrast, we start with the official nuclear doctrine of the country issued in January 2003.106 In its very first statement, the doctrine states that the country’s policy is to build and maintain "a credible minimum deterrent". It then goes on to warn: “nuclear retaliation to a first strike will be massive and designed to inflict unacceptable damage.” Unacceptable damage, in plain English, means that these nuclear weapons would be dropped on cities, each killing hundreds of thousands or even millions of innocent people.

The Indian memorial to the ICJ, on the other hand, argued that nuclear deterrence should be considered “abhorrent to human sentiment since it implies that a state, if required to defend its own existence, will act with pitiless disregard for the consequences of its own and adversary’s people.”107 The memorial also asks whether “the use of nuclear weapons would be lawful as a measure of reprisal or retaliation if the same is used by any adversary in the first instance” and goes on to argue that even where a wrongful act involved the use of a nuclear weapon, the reprisal action cannot involve use of a nuclear weapon without violating certain fundamental principles of humanitarian law. In this sense, prohibition of the use of a nuclear weapon
in an armed conflict is an absolute one, compliance with which is not dependent on corresponding compliance by others but is requisite in all circumstances. In view of the above, the use of nuclear weapons even by way of reprisal or retaliation appears to be unlawful.

In just a few years, therefore, India moved from a clear and forthright condemnation of deterrence and nuclear retaliation to an enthusiastic invocation of deterrence and a policy of “unacceptable damage”. Its ideas on non-proliferation—when interpreted as just the prevention of acquisition of nuclear weapons by new states—have also changed. Such a shift in attitude was on display during the unexpected vote against Iran at the International Atomic Energy Agency in 2005. In an earlier era, Indian leaders would have denounced the hypocrisy of the United States, with its immense nuclear arsenal, lecturing Iran about its small uranium enrichment plant. Now, India’s rhetoric focuses on why nuclear proliferation is dangerous and why Iran should not be allowed to have nuclear technology. Non-proliferation, which used to be seen as immoral, has come to take the place of disarmament as the most important goal of Indian diplomacy.

CONCLUSION

In international fora, India has often advanced initiatives in favour of global nuclear disarmament. Historically it supported numerous resolutions at the United Nations General Assembly (UNGA) calling for the elimination of nuclear weapons. One initiative that Indian diplomats and government officials appear to be particularly proud of is former Indian Prime Minister Rajiv Gandhi’s plan (RGP) for time bound nuclear disarmament, which was initially unveiled at the UNGA’s third special session on disarmament in 1988. This plan has since been revived. In September 2011, for example, Prime Minister Manmohan Singh said at the UNGA that the RGP “provides even today a concrete road map for achieving nuclear disarmament in a time-bound, universal, non-discriminatory, phased and verifiable manner.” Earlier in the year, the government set up a panel to revisit the RGP and push for global nuclear disarmament.

Such public advocacy for the RGP, however, is somewhat hypocritical when viewed in light of the ongoing modernization plans described in this paper. The original RGP is unequivocal in its call for strong restraints on weaponization and modernization: “The very momentum of developments in military technology is dragging the arms race out of political control. The race cannot be restrained without restraining the development of such technology... The disarmament approach must devise arrangements for controlling the continuous qualitative upgrading of nuclear and conventional weapons.” Current Indian policy, on the other hand, has encouraged continuous upgrading, i.e., modernization, of nuclear weapons and missiles. Furthermore, it has also attempted to directly or indirectly thwart any international treaties to control such efforts.

NOTES

1. Some months after the May 1998 nuclear tests, while speaking in the Indian parliament, Prime Minister Vajpayee assured its members: “While our decision is to maintain the deployment of a deterrent which is both minimum and credible, I would like to reaffirm to this House that the government will not accept any restraints on the development of India’s R&D capabilities.” Brahma Chellaney, “Expert Comment: New nuclear clarity with old waffle,” Hindustan Times, 3 January 1999.


5. PTI, “One of the 5 nuke devices at Pokhran-II was a weapon,” Indian Express, 21 June 2000. Elsewhere, Chidambaram has described one of the objectives of the 1998 tests as being the “[c]ertification of the fission nuclear weapon of 15 kt yield, evolved from the PNE device tested in 1974, with substantial changes that were needed to make it smaller in size and weight from the point of view of weaponisation.” Chidambaram, “The May 1998 Pokhran Tests: Scientific Aspects,” op. cit.


7. In 1999, Anil Kakodkar, who was to go on to become the head of the AEC, told the press that nuclear weapons “research is on. We have not stopped.” Anonymous, “India can make neutron bomb: Chidambaram,” The Hindu, 17 August 1999.


10. The first of these was S. K Sikka, Falguni Roy, and G. J Nair, “Indian Explosions of 11 May 1998: An Analysis of Global Seismic Body Wave Magnitude Estimates,” Current Science 75, no. 5, 1998, pp. 486–491. Several follow-up articles were published in this journal, including a few by members of the Atomic Weapons Establishment in the United Kingdom arguing for a much lower figure than the DAE’s estimate of the total yield.


20. M. V Ramana, R. Rajaraman, and Zia Mian, “Nuclear Early Warning in South Asia: Problems and Issues,” Economic and Political
42 Assuring destruction forever


23. The early Agni missile used both solid and liquid propellants and was never deployed.


36. Manu Pubby, “India’s n-sub club, Arihant to be inducted in next two years,” Indian Express, 27 July 2009.


39. Anandan, “Second nuclear submarine headed for year-end launch,” op. cit. In typical media fashion, the 2013 date was appended with the qualifier: “when the country will attain the much-desired nuclear triad” with no indication of who exactly desires the nuclear triad. The impression created, deliberately or inadvertently, is that the nuclear triad is sought after by every country in South, East and South-East Asia.


42. Rajat Pandit, “India Becomes 6th Nation to Join Elite Nuclear Submarine Club,” The Times Of India, 24 January 2012, http://articles.timesofindia.indiatimes.com/2012-01-24/india/30658507_1_nuclear-submarine-extensive-sea-trials-ins-chakra. Characteristics of the Indian elite’s penchant inadvertently, is that the nuclear triad is sought after by every country in South, East and South-East Asia. The impression created, deliberately or inadvertently, is that the nuclear triad is much-desired nuclear triad” with no indication of who exactly desires the nuclear triad. The latter is less desirable for use in nuclear weapons, but it is possible to use reactor-grade plutonium to make nuclear weapons.


46. Weapon-grade plutonium refers to plutonium that has low concentrations of the higher isotopes of plutonium, especially plutonium-239. This is in contrast to reactor-grade plutonium that has greater concentrations of these higher isotopes. The latter is less desirable for use in nuclear weapons, but it is possible to use reactor-grade plutonium to make nuclear weapons.


53. Zia Mian and A. H. Nayyar, “Playing the Nuclear Game: Pakistan and the Fissile Material Cutoff Treaty,” Arms Control Today, April 2010. Pakistan has also a more long-standing objection to the FMCT as envisioned by the nuclear weapon states which want its scope to be restricted to only future production, allowing them to maintain their much larger stockpiles.


60. Ibid.


65. Pandit, “India steps up production of Prithvi and BrahMos,” op. cit.


77. Ibid.


79. SIPRI Yearbook 2011, op. cit., pp. 198–211.

80. Ibid., p. 168.


82. Anjali Ghosh, India’s Foreign Policy. New Delhi: Pearson Education India, 2009, pp. 80–82.


91. Harsh V. Pant and Gopalaswamy Bharath, “India’s Emerging Missile Capability: The Science and Politics of Agni-III,” Comparative Strategy 27, no. 4, 2008, pp. 376–387, http://www.tandfonline.com/doi/abs/10.1080/10495530802058368. There has also been movement among personnel employed in defence and space research. The most prominent of these was the head of the missile programme, Abdul Kalam. Kalam began his career as a scientist in the Defence Research and Development Laboratory (DRDL), was moved to the Indian Space Research Organisation in the 1970s to head up the Satellite Launch Vehicle programme, and then was moved back returned to DRDL in the early 1980s to lead the Integrated Guided Missile Development Programme that developed the Prithvi and Agni missiles. W. P. S Sidhu, “The development of an Indian nuclear doctrine since 1980,” Ph.D., Emmanuel College, Cambridge University, 1997.

92. Somasekhar, “All fired-up on the missile front,” op. cit.


96. The other main parliamentary opposition of that time came from the coalition of left parties, who declared that they were not for nuclear weapons but were opposed to bartering away India’s ‘right to test’ even as they were not saying that it should exercise this right.


99. For all his mild-manneredness, Kalam is reported to have recorded his reactions to the 1998 nuclear tests as: “I heard the earth thundering below our feet and rising ahead of us in terror. It was a beautiful sight.” See Amartya Sen, The Argumentative Indian: Writings on Indian History, Culture, and Identity, Macmillan, 2006, p. 253.


106. Press Release: Cabinet Committee on Security reviews progress in operationalizing India’s nuclear doctrine, op. cit.


108.Ibid., 259–260.

109. The opportunistic switch in stance is somewhat akin to what has been called the third class railway compartment syndrome. Those waiting on a crowded platform clamour in the name of justice and fairness to be let into compartment. But once inside, the opportunist shuts the door and keeps the others outside, with force if necessary.


