THE INDIAN NUCLEAR BOMB - LONG IN THE MAKING

by M. V. Ramana

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On 11 May 1998, the Buddha's birth anniversary, India tested three nuclear devices. Two days later, two more tests were conducted. After these tests, the Indian Prime Minister Atal Behari Vajpayee triumphantly announced that India was now a Nuclear Weapon State. Though India's nuclear capability has been public knowledge for quite some time, the tests took the world by surprise. The decision to test was an immediate, political one; however, India's nuclear weapons program has a long history.

As early as 26 June 1946, when addressing a public gathering in Bombay, Pandit Jawaharlal Nehru, soon to be India's first Prime Minister, said: "As long as the world is constituted as it is, every country will have to devise and use the latest scientific devices for its protection. I have no doubt India will develop her scientific researches and I hope Indian scientists will use the atomic force for constructive purposes. But if India is threatened, she will inevitable try to defend herself by all means at her disposal."

The Indian nuclear program can be divided roughly into three stages. Nehru's sentiment underlay the first stage, which lasted from its inception to the mid-sixties. During this stage a large nuclear program, primarily aimed at producing energy, was planned. While the existing infrastructure did not permit the production of nuclear weapons, the possibility of using it for defense purposes was privately acknowledged and informed the plans. The second stage, beginning in the mid-sixties, culminated in publicly demonstrating India's nuclear capability through the "peaceful nuclear explosion" of 1974. During this stage the basic infrastructure to produce nuclear weapons was slowly put into place. But the military intent of the program was never publicly acknowledged. The third stage saw India maintaining that it had the option to build nuclear weapons but that it had chosen not to actually manufacture or deploy them. Simultaneously India was increasing its capability to build a nuclear arsenal as well as a missile program to deliver them. With the Hindu nationalist Bharatiya Janata Party coming to power in March of this year, the third stage culminated in the recent tests.

Nuclear Power: The Early Beginnings

The Indian nuclear program was started in the mid-forties, around the time it gained independence from over two centuries of British rule, and soon after the United States bombing of Hiroshima and Nagasaki. The legacy of colonial rule and the destruction of Hiroshima and Nagasaki had a powerful impact on Indian leaders. They saw India's technological backwardness and military inferiority as the main causes of colonization. It was natural that Indian leaders would be interested in the latest scientific and technological advance

at the time of independence - nuclear technology. Nuclear technology promised both energy for development and powerful weapons for defense.

From the very beginning, the Indian nuclear program was ambitious and envisaged having indigenous capability for covering the entire nuclear fuel cycle. Over the years, apart from nuclear reactors, India also developed facilities for mining Uranium, fabricating fuel, manufacturing heavy water, reprocessing spent fuel to extract Plutonium and, more recently, enriching Uranium. Investment in this wide range of activities was often uneconomical. But it was justified on the grounds of self-sufficiency, a theme popular in post-colonial India. Though only a part of the infrastructure needed to manufacture nuclear weapons was in place, the program never lost sight of the possibility that the facilities constructed and expertise gained could be used for military purposes.

> *Very early on, Robert Oppenheimer, head of the Manhattan project explained the connection between nuclear power and nuclear weapons. His comments, from 1946 on a proposal for the international control of nuclear weapons, are apt for India.*
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> *"We know very well what we would do if we signed such a convention: We would not make atomic weapons, at least not to start with, but we would build enormous plants, and we would design these plants in such a way that they could be converted with the maximum ease and the minimum time delay to the production of atomic weapons saying, this is just in case somebody two-times us; we would stockpile uranium; we would keep as many of our developments secret as possible; we would locate our plants, not where they would do the most good for the production of power, but where they would do the most good for protection against enemy attack."*

Several countries, like the U.K., Canada and the U.S., offered technical help to India's fledgling nuclear program. The framework for U.S. aid was the Atoms for Peace program. Eisenhower initiated this to forestall criticism of the use of atomic energy for military purposes and to wean away third world countries from the Soviet Union. As part of this initiative, the U.S. offered $80 million as a low interest loan towards the cost of the first Indian nuclear reactor at Tarapur, constructed by General Electric.

As it became clear that China was developing a nuclear bomb, there was even a proposal that the U.S. help India conduct a nuclear test. In a 1961 memorandum to Secretary of State Dean Rusk, George McGhee, Director of the Policy Planning Council, suggested that assisting India to test a nuclear device first was one way to reduce the political impact of a Chinese bomb. Rusk did not approve this idea, in part, because India's Prime Minister Jawaharlal Nehru was likely to reject it.

Nehru was a champion of the non-aligned movement and had made several disarmament proposals. Prominent among them was the Comprehensive Test Ban Treaty (CTBT). In a proposal dated April 8, 1954, he requested the nuclear weapon states to negotiate: "Some sort of what may be called `Standstill Agreement', in respect at least, of these explosions, even if arrangements about the discontinuance of production and stockpiling must await more substantial agreements among those principally concerned." The proposal, coupled with worldwide concern about the dangers of radioactive fallout, galvanized opposition to testing. It resulted in the Partial Test Ban Treaty of 1963. India was one of the first countries to sign it.

Despite the buildup of nuclear infrastructure, Nehru's avowed opposition to nuclear weapons as well as India's recent history of non-violent struggle for independence under Mahatma Gandhi, ensured that there was never any support for developing nuclear weapons. During

Nehru's tenure as Prime Minister, the issue of developing nuclear weapons was raised only once in the Indian Parliament. Soon after India lost the 1962 border war with China, Ramachandra Bade, a member of the Jan Sangh, the forerunner of the ruling Bharatiya Janata Party (BJP), said: "Only those who wish to see Russians or Chinese ruling India will oppose the development of nuclear weapons." Nehru maintained that the cost and effort involved in making nuclear weapons and the hypocrisy of doing so, while asking others to give them up, did not justify the small psychological benefit of nuclear status.

Nuclear Power or Nuclear Defense?

Three events mark the shift in India's nuclear program away from one that was entirely focused on generating energy. The first was the death of Jawaharlal Nehru. While encouraging the development of a militarily capable nuclear infrastructure, Nehru had always opposed explicit weaponization. The second was the completion of a reprocessing plant and the CIRUS research reactor, which began operating in 1960. The CIRUS, India's first heavy water reactor was originally called CIR for Canada-India-Reactor, because it was built with Canadian assistance. After the United States supplied the required heavy water for staring the reactor, it was renamed CIRUS. This gave India the ability to extract plutonium and thus to make nuclear weapons. The third event was the first Chinese nuclear test in 1964, barely two years after India lost the war with China.

Of these three, the Chinese nuclear test was the most significant. For the first time several influential individuals among the bureaucracy, political parties and intellectuals argued for India developing nuclear bombs. They were the forerunners of what became known as the "bomb lobby" in India. Over the years, the bomb lobby's influence on actual policy has varied, but they have always been a prominent part of the debate. While there were considerable differences in what they advocated, they all agreed that India had to develop nuclear weapons.

The chief arguments for developing nuclear weapons were largely based on the rationales used by the U.S. and the Soviet Union during the cold war. The bomb lobby argued that nuclear weapons are required to counter nuclear weapons, they guarantee security, and that they are relatively cheaper than conventional weapons and provide more destructive power. Many in India also identified having a nuclear bomb as a source of international prestige.

One of the key supporters of the development of nuclear weapons was the founder of the Indian nuclear program, Homi Bhabha. He was a successful theoretical physicist and a good institution builder. Bhabha belonged to the wealthy Parsi community, which migrated to the West Coast of India from Iran several centuries ago. After studying and working in Cambridge University, England, he worked for a few years at the Indian Institute of Science. Bhabha then started the Tata Institute of Fundamental Research, the birth place of the Indian nuclear program, in 1945. In a radio speech a week after the Chinese nuclear test, Bhabha claimed that nuclear weapons could be produced quickly and at a relatively low cost. Given Bhabha's prestige and influence, it was hard for others to argue against him.

However, after Bhabha's death in 1966, the Department of Atomic Energy slowed down the quest for nuclear weapons. Bhabha's successor, Vikram Sarabhai, felt that developing nuclear energy was more important than the defense uses of nuclear weapons. Some analysts trace the actual timing of the decision to conduct India's first nuclear test in 1974 to a few months after his death in 1971. Nevertheless, even during his tenure, scientists and technicians working in the nuclear establishment continued developing the capability to make nuclear weapons. Chief among them was actually separating Plutonium and setting up a research reactor called Purnima to study the behavior of fast neutrons, which was very useful in designing the 1974 device.

The negotiation of the Nuclear Non-Proliferation Treaty (NPT) in 1967 prompted another round of debate over nuclear weapons in India. After initial attempts to seek security assurances from the nuclear weapon states, India decided to vote against the treaty and argued against the its discriminatory aspects. The NPT, which seeks to prevent nuclear proliferation, divides its signatories into two categories: nuclear weapon states (NWS) and non-nuclear weapon states (NNWS). Only those states that had developed and tested nuclear weapons before the treaty was negotiated were included in the first category. These are the USA, USSR, Britain, France and China, who are also the permanent members of the UN Security Council, the so-called P-5.

India objected to this division and on more than one occasion described this as "nuclear apartheid." This emphasis on non-discrimination (i.e. treating all signatories as equal) has since come to mark the Indian position on arms control and disarmament initiatives. In 1968, when the treaty was open for signing, 61 countries joined the treaty. India was not among them. Currently it is one of three countries with nuclear facilities that have not acceded to this (or equivalent) treaty.

A little over a year after the NPT went into force, India and Pakistan fought their third war. During this war the US Seventh Fleet, led by the USS Enterprise, was sent into the Bay of Bengal. Henry Kissinger, Secretary of State at the time, claimed the move was designed not only to 'assist' Pakistan, but also to 'back up the Chinese'. For the Indians, however, the 1971 intrusion was a form of "gunboat diplomacy" that was possibly nuclear. This is widely regarded as a factor in the decision to conduct India's first nuclear test.

The "Peaceful Nuclear Explosion" and After

On May 24, 1974, at the height of a nation-wide railway strike (led by the current Defense Minister, George Fernandes), India conducted its first nuclear test at Pokharan in the desert in Rajasthan. The telegram sent to the Prime Minister Indira Gandhi by Raja Ramanna, the leader of the team that carried out the explosion, read "The Buddha is Smiling" – a phrase that has become the source of several article titles. The device tested is believed to have been large and heavy with a yield of about 8-12 kilotons, a little less than the weapon that was dropped on Hiroshima.

India termed the test a "Peaceful Nuclear Explosion" and launched a diplomatic offensive trying to prove that it was indeed peaceful. Part of the motivation to call the tests "peaceful," was to maintain technological ties with the U.S. and Canada. When Canada and the US agreed to provide assistance in building and operating India's CIRUS research reactor, India pledged to use the facility and the fissile material coming out of it for purely peaceful purposes. By terming its test a peaceful nuclear explosion - which was well within the terms of nuclear discourse at that time - India maintained that it had not violated its pledge. Despite this, the test led to the withdrawal of practically all cooperation in nuclear technology with the US and Canada.

To avoid such problems in the future, India subsequently built a similar, but larger, research reactor called Dhruva. Dhruva started functioning in 1985. It has been estimated that India could have accumulated about 300-500 kgs of Plutonium from these two reactors. Judging from the sophistication of the recent tests, Indian designs probably use less than 5 kg of Plutonium for each nuclear bomb. Hence, India has sufficient stocks of fissile material for over 60 to 100 bombs.

It is striking that all the leaders of the group that conducted the 1974 test went on to head the Department of Atomic Energy. The first, Raja Ramanna, is known for his hawkish views. He went on to become the science advisor to the Minister of Defense in 1977-1979 and the minister of state for Defense in 1989-91. According to recent revelations, it was during his tenure as science advisor that the manufacture of nuclear weapon components, which had been temporarily stopped after the 1974 test, was restarted.

The next of the Pokharan leaders who went on to head the Department of Atomic Energy, P. K. Iyengar, also continued to expand the infrastructure to make nuclear weapons. The third leader of the group to also become head the DAE was R. Chidambaram. In a 1994 interview, while denying reports of radioactivity releases from the 1974 test explosion, he went on to triumphantly assert, "that's how good our bomb was." This was the first time a high official within the Department of Atomic Energy had publicly called the "peaceful nuclear explosion" what it was - a bomb.

The Missile Program

The quest for nuclear capability also extended to developing vehicles for delivering nuclear weapons. In 1983, the Integrated Guided Missile Development Program (IGMDP) was set up. The guiding force behind the program, Abdul Kalam, was born in a poor family in Southern India. Inspired by an article on the British Spitfire, he took up Aeronautical Engineering at the Madras Institute of Technology (known locally as MIT!). After working as a leading scientist in India's defense related research agencies, he headed the Satellite Launch Vehicle Program in India's civilian space program, before finally leading the missile program.

Abdul Kalam brought a more open management style practiced in the Indian civilian space program to the relatively closed defense research program. This included involving academic institutions in defense research as well as subcontracting projects and the manufacture of components to private firms. He also acquired technology from the civilian space program for the military missile program. This form of integration of civilian scientific programs with national security goals was clearly a result of the 1974 test. Kalam won great acclaim for his role in successfully developing guided missiles. He was appointed to head India's main defense research agency, and was subsequently awarded India's highest civilian honor - the Bharat Ratna.

The Indian guided missile program started with the development of five missile systems - the short range Prithvi (Earth), the intermediate range Agni (Fire), the surface to air missiles Akash (Sky) and Trishul (Trident), and the guided anti-tank Nag (Snake). By 1988, the results of the new program were visible - the first test of Prithvi was conducted on 25 February 1988. This was followed the next year with a test of Agni. More recently, other missile systems are under development – the Pinaka, the Sagarika and the Astra.

Round Two of the Non-Proliferation Treaty (NPT)

The indefinite extension of the NPT in 1995 was another blow to the Indian position on nuclear disarmament. Under the NPT, Non-Nuclear Weapon-States abjure nuclear weapons and in exchange Nuclear-Weapon States agreed to "pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a Treaty on general and complete disarmament under strict and effective international control." While the Non-Nuclear Weapon-States have almost without exception kept their end of the bargain, the Nuclear Weapon-States have failed to keep theirs. Since the NPT was signed, the

Nuclear Weapon-States have conducted innumerable nuclear weapons tests and increased the size and destructive power of their arsenals.

In 1995, the NPT came up for review and a decision about extending it had to be made. Despite opposition by the Non Nuclear Weapon-States, the Nuclear Weapon-States, led by the US, forced through an indefinite extension of the NPT. This was widely interpreted in India as the permanent entrenchment of an unequal system. The indefinite extension of the NPT strengthened the position of the bomb lobby in debates over Indian nuclear policy and provided grounds for a renewed campaign for nuclear weapons.

Debating the Comprehensive Test Ban Treaty

The first effect of this campaign was that India voted against the CTBT in 1996, a treaty it had championed for forty years. This came as a big surprise since India had consistently supported non-discriminatory global arms control measures such as the CTBT and a cutoff on the production of fissile material (fissban). Even as late as 1994, it co-sponsored the CTBT at the United Nations, along with the USA. However, after the indefinite extension of the NPT, things had changed.

In the domestic debate, the Indian bomb lobby argued that the indefinite extension implied nuclear weapons were going to be around forever. Hence India should either develop nuclear weapons or settle for permanent second-class status. To develop militarily useable nuclear weapons India had to test. Therefore it had to reject the CTBT.

In international forums, as well as official circles, two main arguments were used against the CTBT. First, the CTBT did not really constrain the weapons development programs of the Nuclear Weapon-States, especially the U.S. The U. S. had started a multi-billion dollar Science Based Stockpile Stewardship Program involving the construction of several facilities that could develop new weapons designs. This was not the case when the CTBT was first proposed in the 1950s. It was the hundreds of tests conducted in the intervening period that allows the U.S. to design new weapons without nuclear testing.

Second, the CTBT was no longer a step towards disarmament as had always been envisioned. Instead, the Nuclear Weapon-States viewed it as merely a measure that would, in the words of the head of the erstwhile Arms Control and Disarmament Agency of the USA, "freeze countries on the nuclear learning curve." The rationale for the Stockpile Stewardship Program was to ensure the US nuclear arsenal would remain functional for the foreseeable future. India demanded that the CTBT be coupled to a time-bound program for nuclear disarmament. The Nuclear Weapon-State were completely opposed to this.

A less noticed, but important, shift in India's stance was the perceived role of its nuclear weapons. While refusing to sign discriminatory agreements and continuing to build its nuclear infrastructure in the past, India had always maintained that nuclear weapons were immoral and deterrence, an abhorrent doctrine. As late as March 1996, the Indian Foreign Secretary, Salman Hyder said "We do not believe that the acquisition of nuclear weapons is essential for our national security and we have followed a conscious decision in this regard." This was in line with the traditional Indian view.

However, when the Indian Ambassador to the Conference on Disarmament, Arundhati Ghose, rejected the CTBT in the present form on 20 June 1996, she said the CTBT was not "in India's national security interest" and "our national security considerations (have) become a key factor

in our decision-making." This shift points to the dangerous impact on Indian nuclear policy of arguments advanced by the bomb lobby.

Conclusion

Despite refusing to sign the CTBT, the last two Indian Prime Ministers belonging to the center-left United Front party did not authorize nuclear tests. This was left to the Hindu Nationalist Bharatiya Janata Party (BJP). The large number of tests with differing designs – a thermo-nuclear fusion weapon, a light weight fission weapon and three sub-kiloton tactical nuclear weapons – suggest that, unlike the 1974 explosion, these tests are intended to develop weapons for military purposes. The Indian Prime Minister also stated that a Command and Control system was in place, thus making it clear that it is possible to deploy these weapons.

With Pakistan following suit by conducting a set of nuclear tests and the low intensity war in the disputed Kashmir region continuing unabated, the likelihood of a nuclear war has never been more real. The only way to foreclose the possibility of nuclear war in South Asia is to eliminate nuclear weapons from the region. As the preceding history of the Indian program shows, this is unlikely without the worldwide abolition of nuclear weapons.

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