Map 1.1 : Nuclear Related Sites
CHAPTER – 1
INTRODUCTION

As early as June 26, 1946, Pandit Jawaharlal Nehru, soon to be India’s first Prime Minister, announced:

“As long as the world is constituted as it is, every country will have to devise and use the latest 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 inevitably try to defend herself by all means at her disposal."

The impish, round-faced physicist wiped sweat from his brow in the 107-degree heat. Sixty-one, he was too old to be wearing army fatigues. They provided less heat relief than light white cotton. Yet, there he was, a South Indian Brahmin in the Rajasthani desert, the chairman of the Indian Atomic Energy Commission pretending to be an army major general. Dr. Rajagopala Chidambaram was about to make his mark on Indian, and perhaps world history. At his side sat Dr. A. P. J. Abdul Kalam, a short sixty-six-year-old aeronautical engineer with long white hair, a Muslim with a self-professed fondness for Hindu culture who bore the alias Major General Prithviraj. The code name betrayed the ironic wits of these men and their colleagues. Prithviraj was New Delhi's twelfth-century Hindu ruler, and Prithvi was the name of India's first nuclear-capable ballistic missile, which Kalam had helped bring into the world.

Dr. Rajagopala Chidambaram and Dr. A.P.J. Abdul Kalam were not playing soldier; they were sitting, disguised, in a small control room listening to a fateful countdown: five, four, three, two, one . . . They were leaders of the strategic weapons establishment, an enclave of scientists and engineers in India's defense research and atomic energy institutions who for five decades had been pushing India to join the exclusive club of nuclear weapon states. Now, on May 11, 1998, they were on the verge of crossing the threshold unambiguously.

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1 B.M. Udgaonka, India’s nuclear capability, her security concerns and the recent tests, Indian Academy of Sciences, January 1999.
Almost exactly twenty-four years earlier, in May 1974, Chidambaram and a couple of dozen fellow scientists and engineers had encamped at this same desert site 150 kilometers from the Pakistani border, near the village of Pokhran. During the nights as they lay on cots in the hot air they looked to the skies and searched for the light of a passing American satellite, wondering whether they would be detected as they prepared to conduct India's first nuclear explosion. They went unnoticed, and on May 18, 1974, the team detonated what India's leader, Indira Gandhi, insisted was a "peaceful nuclear explosive." But the ambivalence of this peaceful nomenclature meant trouble for the strategic weaponeers. Indira Gandhi and successive prime ministers resisted the scientists' and engineers' desires to conduct additional tests and develop an overt nuclear weapon program. Moral doubt, political turmoil, and the censure of the United States and the international community put the brakes on their plans. For twenty-four years the scientists and engineers pushed against the Indian government's self-restraint.

Now, in the hot May of 1998, veterans like Chidambaram and newer additions to the enclave like Kalam and K. Santhanam were on the verge of manifesting decades of theoretical and experimental work. The team in Pokhran had learned lessons from previous frustrated testing attempts, most recently in 1995, when U.S. satellites had spotted them. Washington then exerted considerable pressure on India's prime minister to desist, which he did. This time, more than two years later, the scientists, engineers, and laborers employed elaborate camouflage—including the fatigues on their backs to make them look like army men, not bomb builders and testers. They worked in the open desert only when they knew spy satellites were not overhead. And this time they had the firm blessing of a new government led by the Bharatiya Janata Party (BJP), which unlike all previous ruling parties rejected India's normative aversion to nuclear weapons. The BJP wanted the bomb, and the strategic enclave wanted to give it to them. Together they were going to show themselves and the world that they had mastered the ultimate in human power over nature, the hydrogen bomb.

At 3:45 p.m. local time, the countdown ended and the desert rumbled. Three nuclear devices exploded simultaneously. The scientists, engineers, and army
laborers cheered. It was possible that India, and perhaps the world, would never be
the same. Whether for good or ill remained to be learned.

Prime Minister Atal Behari Vajpayee, a soft-spoken seventy-one-year-old bachelor who had built his Hindu revivalist party into a formidable political presence, declared that India is now a nuclear weapon power. Its exact capabilities-quantitatively and qualitatively-remained uncertain to the Indian public and the outside world. Yet India certainly possessed now-proven designs for compact fission weapons of destructive power akin to the bombs that destroyed Hiroshima and Nagasaki, and probably for more powerful boosted-fission weapons. With subsequent refinement, thermonuclear weapons, or H-bombs, were also now within India's grasp. In 1998, analysts believed India possessed roughly twenty-five ready-to-assemble fission weapons, with enough weapon-grade plutonium for perhaps an additional twenty-five, depending on assumptions regarding warhead designs. India also operated a pilot plant for extracting tritium from heavy water, a key isotope for boosted-fission and thermonuclear weapons. Several means existed for delivering these weapons. Dozens of imported Jaguar, MiG-27, and Mirage-2000 fighter-bomber aircraft were capable of performing this role, and some unknown number of these aircraft had been modified to conduct nuclear missions. India also possessed a few dozen Prithvi ballistic missiles with ranges from 150 to 250 kilometers. These conceivably could carry nuclear weapons to targets in Pakistan. The longer-range Agni missile was still under development. A first-generation design of the Agni system had been tested three times, to ranges of approximately 1,000 kilometers, and in 1998 the Defence Research and Development Organisation was preparing to flight-test an improved version intended to range up to 2,500 kilometers. The Agni was now slated to be the nuclear weapon delivery system against China. Indian strategic analysts suggested that the state should advance its ballistic missile capabilities to the point where targets 5,000 kilometers away could be reached.

However, India still lacked a national security and defense strategy to determine the role of nuclear weapons. Since 1974, India had pursued a "nuclear option" strategy. This entailed the capability to assemble nuclear weapons quickly-within hours or a few days-paired with the expressed intention not to do so until a
grave threat to its security. The nuclear option reflected India's normative aversion to nuclear weapons, its emphasis on global nuclear disarmament, and political leaders' preferences to concentrate resources and energy on economic development. Indian leaders and some strategic analysts believed that nuclear deterrence could be effected without prior deployment of nuclear weapons mated to their delivery systems. They categorically rejected the doctrines and arms racing of the cold war superpowers. They tended to view preparations for fighting a nuclear war as excessively dangerous, costly, and immoral. In South Asia, especially, the proximity of India and Pakistan to each other made the risks of radiation fallout great even if an aggressor could execute an early strike. Instead of building redundant nuclear arsenals on hair-trigger alert in the name of certain mutual destruction, the few Indians who attended to these issues believed that it was adequate to make an adversary uncertain that nuclear threats or attacks on India would not be met with nuclear reprisals. Nuclear weapons pose such horrifying threats, they argued, that this approach was adequate to deter a rational adversary. No greater capability would deter an irrational adversary.

Nonetheless, in the 1990s, Indian strategists and a few politicians began seriously to question the adequacy of the "option" strategy and nonweaponized deterrence. The Nuclear Non-Proliferation Treaty was extended indefinitely in 1995, perpetuating the possession of nuclear weapons by the United States, Russia, Britain, France, and China for the indefinite future while denying the rest of the world these weapons. This outraged Indian specialists and the attentive public, prompting rethinking of India's own nuclear policy. Some Indian military and nongovernmental strategists had long ago decided that the country should deploy nuclear weapons. For them, the developments in the mid-1990s offered another political opportunity to make their case. True believers in nuclear disarmament had been driven from effective power by 1998 or had been disillusioned by the failure of the major powers to pursue nuclear disarmament even after the cold war's end. Cynics who had used complaints about inadequate progress in nuclear disarmament to cover India's own ongoing nuclear weapons and ballistic missile programs, wanted to lift the veil. The
strategic enclave had run out of patience. After twenty-four years of self-restraint, the May 1998 nuclear tests reflected all of these changes.

Still, no new doctrine guided the tests, only vague imperatives to show national will and status. Nor did a consensus emerge after the tests on what India's nuclear doctrine should be. Several developments seemed likely. India might or might not decide to deploy nuclear weapons on aircraft or ballistic missiles in an overt, readily usable posture. Deployment or not, the state would develop formal command and control arrangements to demonstrate clearly that India could and would respond to nuclear threats against it. India would also maintain its traditional insistence that it would not use nuclear weapons first. That is, India would launch nuclear weapons only in retaliation to a nuclear attack. India also would eschew nuclear-war-fighting doctrines in hopes of limiting the number of nuclear weapons it would possess to a minimum necessary to cause politically unacceptable damage to an aggressor. However, it remained unclear whether partisan political pressures within India and Pakistan would thrust the two states into an arms race despite their professed desires to minimize their arsenals. Even settling on and implementing these basic doctrinal principles would require overcoming inertia, interservice rivalries, political fractiousness, and preoccupation with more pressing domestic issues.

Three major questions are answered in thesis work.

1) Why did India develop its nuclear weapon capability when it did and the way it did?

Conventional wisdom holds that India has sought and acquired nuclear weapon capability to redress threats to its security. China and Pakistan, separately or together, pose the threat. The U.S. Defense Department's 1996 publication Proliferation: Threat and Response reflected this typical assessment:

The bitter rivalry between India and Pakistan which dates to the partitioning of the subcontinent in 1947, remains the impetus behind the proliferation of NBC [nuclear, biological, and chemical] weapons and missiles in the region. The security dynamics of the region are complicated further by India's perception of China as a
threat. . . . India's pursuit of nuclear weapons was first spurred by a 1962 border clash with China and by Beijing's 1964 nuclear test.

The official U.S. understanding of why India (and Pakistan) possesses nuclear weapon capability echoes the dominant scholarly conception of nuclear proliferation. Structural Realism, arguably the most influential theory in the international relations field, predicts or explains that states in an anarchic international environment will seek to maximize their power for self-preservation or, more neatly, their security. If an adversary or adversaries possess nuclear weapons, or appear likely to in the future, a state would be expected to seek nuclear capability to balance that threat in the absence of alternative means. Applying this theoretical model to India leads to the common conclusion that the "central cause of Indian nuclear proliferation is a realist one, it was to match the capabilities of China. . . . Only India's nuclear capabilities could elevate India to a position where it could not be subject to Chinese nuclear coercion."

Assuming that states such as India make decisions according to realist models and are driven primarily by national security imperatives, Western theorists and policymakers expect that India should build and deploy a nuclear arsenal of sufficient quantity and operational quality to ensure that it could withstand an adversary's first strike and retaliate with enough nuclear force to end a war on India's terms. Indeed, according to these theories India should have built, deployed, and operationally fine-tuned such a survivable second-strike arsenal long ago.

The following chapters demonstrate that the prevalent explanation of why and how India developed nuclear weapon capability, as just summarized, is based on a number of erroneous "facts" and assumptions. Moreover, the story told through this conventional explanation is woefully incomplete. Whereas most theorists and policymakers dealing with nuclear proliferation posit that security concernssingularly determine state nuclear policies, this study shows that India's development of nuclear weapon capability only vaguely responded to an ill-defined security threat. Furthermore, India's forbearance in proceeding further to deploy a nuclear arsenal-from 1964 to 1998, and perhaps beyond-also cannot be explained primarily
by reference to external security considerations or the universal applicability of Western models of nuclear deterrence.

Domestic factors, including moral and political norms, have been more significant in determining India's nuclear policy, as this thesis details. Often, tensions between domestic interests have made this policy appear ambivalent and ambiguous. India has been torn between a moral antagonism toward the production of weapons of mass destruction, on one hand, and on the other hand, an ambition to be regarded as a major power in a world where the recognized great powers rely on nuclear weapons for security and prestige. India's domestic imperatives to foster socioeconomic development has clashed with an interest in building up military strength. India's policymaking processes and institutions also have affected its nuclear history: Indian political leaders and the leading scientists have consciously excluded the military from nuclear decision making, again for internal reasons. Each of these material and ideological factors has been in some way affected by India's colonial past and postcolonial identity. Acquiring nuclear weapons proves that Indian scientists are as talented as those of the world's dominant powers; doing so in the face of the U.S.-led nonproliferation regime, which Indians consider a system of "nuclear apartheid," reasserts India's repudiation of colonialism. Yet, if India followed fully the nuclear paths of the United States, the United Kingdom, or China, it would violate its own quest to be morally superior to and more humane than these states. These and other related factors largely explain the twists and turns of India's nuclear history from 1947 through 1998. For further details see thesis page no. 83.

2) What are the factors that keep India from stopping or reversing its nuclear weapon program?

Proliferation entails state decisions to acquire nuclear weapons. Nonproliferation involves decisions to verifiably abjure and, in some cases, "reverse" acquisition of nuclear weapons. The latter practice of eliminating capabilities actually amounts to unproliferation, or disarmament. Proliferation and unproliferation are distinct phenomena, even if they are often conceptualized as flip sides of the same coin. (As the cold war major powers shaped the lexicon and
framework of global nuclear policy and the nonproliferation regime, they distinguished between their own accretions of nuclear weapons and the acquisition of nuclear weapons by other states. They called the latter "proliferation." Similarly, they distinguished arms control and disarmament from "nonproliferation," overlooking the essential similarity between disarmament and the hoped-for nonproliferation process of rolling back nascent nuclear weapon capabilities. This book maintains the traditional categorical and lexicographic distinction for convenience's sake and refers to the objective of reversing proliferation as "unproliferation" instead of disarmament, although the same processes are required to achieve either objective.)

Almost all of the existing literature assumes that to reverse proliferation it is necessary only to know and remove the causes that drove a state to acquire nuclear capability in the first place. Assuming that security concerns singularly determine state interests in acquiring nuclear weapons, the prevalent literature posits that if insecurities are removed, unproliferation should occur. However, India's nuclear program challenges these assumptions. India's nuclear weapon capabilities have assumed deeply rooted domestic importance independent of security considerations. The process of building nuclear weapon capabilities has created interests, bureaucratic actors, beliefs, perspectives, and expectations within the state and society. That is, proliferation qualitatively changes the state that engages in it, altering the array of interests that must be addressed before unproliferation can occur. The Indian case suggests that these changes and their effects are particularly important in democracies.

This is not to say that security considerations have been unimportant. India probably will not relinquish its nuclear weapon capabilities as long as Pakistan possesses similar capabilities and as long as the Sino-Indian border dispute remains unresolved and those two nations' strategic relationship unsettled.

Is was not only the security threat posed by the continued proliferation of nuclear weapons, but the lack of any security guarantees by the nuclear weapon states which made India oppose the draft non-proliferation treaty which imposed limitations on their policy options. Actually, after the first Chinese atomic bomb,
India, concerned as it was about the security threat, tried to seek, “effective and credible guarantees of its security from the nuclear powers”, but all its efforts were of no avail.\(^2\) Is was after it failed to get any credible security guarantees that India shifted to an indirect approach where by it insisted that all nuclear powers should cease testing and manufacturing nuclear weapons as well as start reducing their nuclear arsenals.\(^3\)

Now India has Ballistic Missiles (Prithvi, Agni, Surya etc.), Cruise Missiles (Brahmas), Nuclear Submarines in nuclear weapons. Descriptive study about this matter is included in ‘India’s Nuclear Weapon Option and Nuclear Doctrine’ which is chapter 3 in this thesis.

3) **How India’s capabilities effected through United States ?**

The growing energy demands of the Indian and Chinese economies have raised questions on the impact of global availability to conventional energy. The Bush Administration has concluded that an Indian shift toward nuclear energy is in the best interest for America to secure its energy needs of coal, crude oil, and natural gas.

While India still harbours aspirations of being recognised as a nuclear power before considering signing the NPT as a nuclear weapons state (which would be possible if the current 1967 cutoff in the definition of a "nuclear weapon state" were pushed to 1975), other parties to the NPT are not likely to support such an amendment. As a compromise, the proposed civil nuclear agreement implicitly recognises India’s "de facto" status even without signing the NPT. The Bush administration justifies a nuclear pact with India because it is important in helping to advance the non-proliferation framework by formally recognising India's strong non-proliferation record even though it has not signed the NPT. The former Under Secretary of State of Political Affairs, Nicholas Burns, one of the architects of the Indo-U.S. nuclear deal said “India’s trust, its credibility, the fact that it has promised to create a state-of-the-art facility, monitored by the IAEA, to begin a new export

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control regime in place, because it has not proliferated the nuclear technology, we can’t say that about Pakistan.” when asked whether the U.S. would offer a nuclear deal with Pakistan on the lines of the Indo-U.S. deal. Mohammed ElBaradei, head of the International Atomic Energy Agency, which would be in charge of inspecting India's civilian reactors has praised the deal as "it would also bring India closer as an important partner in the nonproliferation regime". However, members of the IAEA safeguards staff have made it clear that Indian demands that New Delhi be allowed to determine when Indian reactors might be inspected could undermine the IAEA safeguards system. The reason for this is to restrict development of nuclear weapons and to negotiate with India indirectly to ratify the NPT using another mechanism.

Financially, the U.S. also expects that such a deal could spur India's economic growth and bring in $150 billion in the next decade for nuclear power plants, of which the U.S. wants a share. It is India's stated objective to increase the production of nuclear power generation from its present capacity of 4,000 MWe to 20,000 MWe in the next decade. However, the developmental economic advising firm Dalberg, which advises the IMF and the World Bank, moreover, has done its own analysis of the economic value of investing in nuclear power development in India. Their conclusion is that for the next 20 years such investments are likely to be far less valuable economically or environmentally than a variety of other measures to increase electricity production in India. They have noted that U.S. nuclear vendors cannot sell any reactors to India unless and until India caps third party liabilities or establishes a credible liability pool to protect U.S. firms from being sued in the case of an accident or a terrorist act of sabotage against nuclear plants.

Since the end of the Cold War, The Pentagon, along with certain U.S. ambassadors such as Robert Blackwill, have requested increased strategic ties with India and a de-hyphenization of Pakistan with India. The United States also sees India as a viable counter-weight to the growing influence of China.

While India is self-sufficient in thorium, possessing 25% of the world's known and economical viable thorium, it possesses a meager 1% of the similarly calculated global uranium reserves. Indian support for cooperation with the U.S. centers around
the issue of obtaining a steady supply of sufficient energy for the economy to grow. Indian opposition to the pact centers around the concessions that would need to be made, as well as the likely de-prioritization of research into a thorium fuel-cycle if uranium becomes highly available given the well understood utilization of uranium in a nuclear fuel cycle.

On March 2, 2006 in New Delhi, George W. Bush and Manmohan Singh signed a Civil Nuclear Cooperation Agreement, following an initiation during the July 2005 summit in Washington between the two leaders over civilian nuclear cooperation.

Heavily endorsed by the White House, the agreement is thought to be a major victory to George W. Bush's foreign policy initiative and was described by many lawmakers as a cornerstone of the new strategic partnership between the two countries. The agreement is widely considered to help India fulfill its soaring energy demands and boost U.S. and India into a strategic partnership. The Pentagon speculates this will help ease global demand for crude oil and natural gas.

On August 3, 2007, both the countries released the full text of the 123 agreement. Nicholas Burns, the chief negotiator of the India-United States nuclear deal, said the U.S. has the right to terminate the deal if India tests a nuclear weapon and that no part of the agreement recognizes India as a nuclear weapons state. For further details see Chapter 6.

REVIEW OF LITERATURE

The researcher will study the literature related to the study of subject i.e. thesis, books, periodicals etc. and will find out the lapses in earlier studies and would like to analyze those lapses and gaps in the present study at most, but in social sciences, the changes took place at the international level quickly, resulted it dimensions of the study needs micro and macro analysis but it is pertinent to mention here that the limitation of the study is there is the field of research in social science.
‘Nuclear India’ edited by Brigadier Vijai K. Nair VSM (Retd.) states that “Hence to fight and conquer in all our battles is not supreme excellence, supreme excellence consists in breaking the enemy’s resistance without fighting”.

“James Schelsinger has written:

Deterrence .... is not something free floating that exists independently of a credible implementable threat. It requires the most careful structuring of forces that is fully consistent with an agreed upon strategic concept”.

Documents on ‘India’s Nuclear Disarmament Policy’ edited by Gopal Singh is equipped with speeches, resolution proposal, treaties, agreements, letters, reports and recommendations made for nuclear weapons free world from Nehru to Vajpayee period.

‘India, Pakistan, China’ Defence and Nuclear Tangle in South Asia by R.R. Subramanian in it nuclear and missile factors are becoming increasingly important factors in determining the security of South Asia.

‘Pakistan in a changing strategic context’ edited by Ajay Darshan Behera, Mathew Joseph C. states an account of changing Pakistan; and understanding of Pakistan in the changing strategic context cannot be confined to contemporary analysis only. Despite the severe impact of the terrorist attacks of September 11, 2001. On Pakistan’s strategic environment, Pakistan’s problems emanate from history, ideology and political culture.

Some of the other important books are as follows:


‘India’s Nuclear Doctrine’ by V.N. Khanna.

‘National Security A Primer’ edited by Con. P.K. Gautam (Retd.).

‘India’s Tryst with the ATOM unfolding the Nuclear story’ by O.P. Sebherwal.

‘Nuclear Deterrence in Southern Asia (China, India and Pakistan)’ edited Arit Rajain.
‘Nuclear India into the New Millenium’ by Anindyo J. Majumdar.

‘India Nuclear Deterrence (Pokhrana II and Beyond)’ by Amitabh Mattoo.


‘Nuclear weapons and power politics’ by Mani Shankar.

‘India’s Nuclear bomb (The impact on global proliferation)’ by George Perkovich.