The Trajectory of India's Nuclear Weapons Development Program

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Abstract: *India's nuclear weapons development program, marked by the country's first nuclear test on May 18, 1974, is generally seen to be motivated by the geo-political threats posed by China. While it is true that China's first nuclear bomb test in Lop Nur in 1964 did bother Indian leaders, is it worth believing that India – an independent, emerging nation in the second half of the 20th century and a proponent of the Non-Aligned Movement (NAM), was triggered into developing its nuclear capabilities only after China's Lop Nur? This paper dives into the question of how much weight the Chinese nuclear test had on India's decision to go nuclear. What prompted India's development of weapons-grade Plutonium? Why and how did India become a Nuclear Weapons State? Who were the parties involved in making India a Nuclear Weapons State? There is limited research on India's trajectory in nuclear weapons development, and hence, no direct answers exist to these questions. This paper tries to fill that lacuna. It argues that the Chinese detonation of a nuclear bomb was not a factor that prompted India's nuclear weapons development program. Instead, there is clear evidence showing that India was producing weapons-grade Plutonium in May 1964, even before the Chinese explosion. Following the trajectory of India's nuclear weapons development program, the paper goes into the archives to prove this argument and concludes that China did not pose an immediate nuclear threat to Indian territories at the time of India's first nuclear test.*

Introduction

India's first Prime Minister, Pandit Jawaharlal Nehru, was a world-known Pacifist. He fiercely advocated for nuclear disarmament and played a monumental role in the signing of the Partial Test Ban Treaty (PTBT) in 1963. "Nehru was both the originator of the idea and its most public face- he was its symbol and essence, evocator and voice."[1] While there is

evidence suggestive of his ambiguous stance on India's possession of nuclear weapons, one can always concede that he was on the peaceful side of the spectrum.[2] Nevertheless, India went on to produce its own nuclear bomb; the first explosion code-named 'Smiling Buddha', took place in Pokhran, Rajasthan under the leadership of Indira Gandhi, Nehru's daughter. The test took place on May 18, 1974, and was proclaimed to be a "Peaceful Nuclear Explosion (PNE)". However, Raja Ramanna, head of the Nuclear Weapons Program during the testing of 'Smiling Buddha', later said "The Pokhran test was a bomb, I can tell you now… An explosion is an explosion, a gun is a gun, whether you shoot at someone or shoot at the ground… I just want to make clear that the test was not all that peaceful."[3] The juxtaposition between the positions of the father and daughter offers a wide scope of research into what changed over the course of time and what led to the ultimate production of nuclear weapons by India.

HOMI J. BHABHA: THE FATHER OF INDIA'S NUCLEAR PROGRAM

Homi Jehangir Bhabha was born in a rich aristocratic family and went to Cambridge University, where he earned his Doctorate in Physics in 1935. His stint as an architect of India's nuclear energy program began in 1939 when he found himself stuck in India as Europe was up in turmoil due to the outbreak of World War II. Realizing there was no chance of return to Europe in the near future, he took up a job in the Indian Institute of Science in Bangalore at the request of Dr. C V Raman—another world-renowned Indian physicist. It was here where he became the Professor of Cosmic Ray Research.[4]

Bhabha played a monumental role in the development of nuclear science in India. He found himself at the helm of India's nuclear program. His closeness with Nehru also helped him in his endeavors.[5] Given his exposure to the scientific research programs in the West, he was quite appalled at the state of scientific research in his country. He wanted a school with "special reference to cosmic rays and nuclear Physics"[6] and was adamant about developing a civilian atomic energy program in India. In order to do so, he approached one of the major industrial groups in India during that time: the Tata Group. In his letter to Sir Dorabji Tata, Bhabha requested sponsorship for his model of the school and presented several reasons for his request. It is imperative to note that one of the most important reasons that he presented was India's potential of becoming a self-sufficient country in nuclear energy. "When nuclear energy

has been successfully applied for power production in say a couple of decades from now, India will not have to look abroad for its exports but will find them ready at hand." [7] Eventually, in 1945, the Tata Institute of Fundamental Research (TIFR) was established with funding provided by the Tata Group, and Bhabha was chosen as its first director. He would refer to it as "the cradle of the Indian atomic energy program."[8]

The next year in 1946, the Atomic Energy Research Committee was formed and Bhabha was chosen as its chairman. Two years later, in 1948, Pt. Nehru submitted a legislation for the creation of an Atomic Energy Commission (AEC), which was then formed by mid-August of the same year, with Bhabha as the chairman. George Perkovich offers a detailed description in regard to the AEC and its functioning. The following is an excerpt from his book- *India's Nuclear Bomb: The Impact on Global Proliferation*:

> In 1948 Nehru introduced before the Constituent Assembly an Atomic Energy Act to create an Atomic Energy Commission and the legal framework for its operation. The act was modelled on Britain's Atomic Energy Act but imposed even greater secrecy over research and development than did either the British or the American atomic energy legislation. The act called for research and development of atomic energy in complete secrecy and established state ownership of all relevant raw materials, particularly uranium and thorium.[9]

Evidently, the AEC imposed a veil of secrecy over atomic energy R&D in India and established the Indian government's ownership of strategic minerals like uranium and thorium, thereby giving the Indian government a strategic over-ride.[10] Perkovich in his book mentions that PM Nehru, while presenting the bill, had argued that there was a "need to protect Indian materials and prospective know-how from being exploited by the industrialized countries in a colonial manner, and also to assure secrecy-minded states like the United States and the United Kingdom that if they cooperated with India in this field their secrets would be protected."[11] Bhabha was also chosen as the Secretary of the Department of Atomic Energy which was established in 1954.

With Bhabha at the helm of major institutes working for the Indian nuclear program, it is natural that these institutes were working in close cooperation

with one another. As such, leveraging the agency these institutes provided to Bhabha, he was striving for "mastery over the energy potential in the atomic nucleus" - "the apogee of science."[12] Evidence of Bhabha's firm belief in the supremacy of the nuclear bomb is found in 'Homi J. Bhabha: A Life', Bhabha's biography authored by Bakhtiar K. Dadabhoy. "Bhabha knew that a time would come when a bomb would have to be made and continued to quietly prepare for it. He regularly invited foreign scientists to lecture on the physics of chain reactions and was always on the lookout for recruiting bright young men who could help him in this quest"[13] Moreover, while addressing Nuclear Disarmament on All India Radio on United Nations Day on October 24, 1964, Bhabha said, "Indeed, the importance of nuclear weapons is that they enable a country possessing them in adequate measure to deter another country also possessing them from using them against it."[14]

Bhabha, also referred to as the 'Father of [the] Indian Bomb,' along with the Indian government, sought nuclear cooperation with select Western powers. Given Prime Minister Nehru's commitment to his policy of non-alignment and a reluctance to align with the United States, compounded by historical colonial tensions that hindered cooperation with the United Kingdom, France emerged as a viable partner for India. Bhabha was instrumental in fostering Indo-French nuclear cooperation, a topic that will be explored in detail in the following section.

INDO-FRENCH COOPERATION (1951)

Apart from Homi Bhabha, the Nuclear Cooperation Agreement (NCA) between India and France signed in 1951 also played a monumental role in India's nuclear weapons development program. The NCA promised the study and construction of a Beryllium moderated low power reactor in India. As a part of this agreement, France was responsible for supplying all the Uranium required for the research and construction of the reactor, while India was responsible for supplying Beryllium. This helped India in a couple of ways. Since India got the required Uranium for the operation of these reactors from France, it could choose to not worry about the enrichment technology, and could also circumvent the disadvantage posed by its lack of uranium deposits in the country.[15] Not only did this cooperation provide India with a great deal of nuclear assistance, but it also enhanced the positioning of India's Atomic Energy Commission (AEC) in the eyes of the world. After all, the

AEC was the first nuclear commission of a foreign country with which the French Commissariat à l'Energie Atomique (CEA) had entered into nuclear cooperation. Moreover, this cooperation was "unique" and "unprecedented" as it emerged at a time when the US and Soviet-led censorship on information of nuclear technology was persistent, which rendered such technological exchanges very difficult.[16] What made the two countries cooperate then and how was it brought about?

One of the most crucial factors in bringing the two countries together was the state that the two countries found themselves in. While India, a newly independent nation still healing from the colonial period, was looking for recognition in the scientific field post-independence, France was similarly looking to recover from the "Manhattan Complex".[17] Moreover, in the Cold War structure of the international theatre, India's position of Non-Alignment resonated with France's decision to withdraw from the integrated command structure of North Atlantic Treaty Organisation (NATO). All of this coupled with the two nations' stance on the Non-Proliferation Treaty (NPT) and their ultimate decision of not signing the treaty worked well in their direction.[18] Lastly, the personal proximity between the scientists of the two countries, specifically Bhabha and Frédéric Joliot-Curie, served to play a crucial role as well. Since the two scientists were leading the atomic commissions of their respective countries, they came to form an informal network which played an influential role in fostering nuclear cooperation between the nuclear agencies of their countries. The personal proximity between the two is evident by looking at the following account.

In 1949, an agreement was made between the Government of India and the French firm *Société de Produits Chimiques des Terres Rares* for the setting up of a monazite (a source of radioactive thorium) processing plant in India. The agreement was a remarkable feat as, in the absence of Uranium reserves, "India values its thorium deposits as a future alternative to uranium for use in nuclear fuel."[19] Moreover, *Société de Produits Chimiques des Terres Rares* was the same firm which "set up the factory at Boucher for the purification of Uranium Oxide for the French Atomic Energy Commission"[20]. With another French entity joining India's quest for nuclear self-sufficiency, Indo-French Nuclear Cooperation was advancing. In fact, in succession of signing of the agreement, Bhabha wrote a personal letter to Frédéric Joliot-Curie, "It gives me great pleasure to know that this agreement will further promote cooperation

in scientific and industrial matters between India and France a country for which I personally have a great affection, and I trust that with the years this cooperation will grow in extent."[21] Moreover, when Joliot-Curie had visited India in January 1950, he and Bhabha attended a private meeting held at the home of one of the members of the AEC which was in itself a 3-member committee. At the same meeting, Joliot-Curie had "offered to share technical information on the purification of uranium, graphite reprocessing, and designs of a low power reactor in exchange for India's export to France of Thorium, Beryllium, and mineral oil for the manufacture of graphite. The offer also included the sale of Uranium should it be discovered in ample quantities at a later date."[22]

In fact, the respective energy commissions, kept cooperating even during the times when the governments of the two countries were not necessarily on their best terms. When India tested its first nuclear bomb in 1974, amidst the hostile reactions from the international community, CEA had sent congratulatory telegrams to AEC. On the other hand, the French government, owing to a change in leadership, insisted on renegotiation of the nuclear agreements with India so that French-supplied nuclear technology and materials could not be used in future Indian nuclear testing.[23]

Hence, the technological assistance and the mutual cooperation between India and France, aided by the signing of several agreements such as the NCA, proved instrumental in the former's nuclear weapons development program.

THE CHINA FACTOR

On May 14, 1964, before India's 'Smiling Buddha' and before China exploded its first nuclear bomb in Lop Nur, a report was dispatched by the United States Director of Intelligence and Research to the Secretary of State which pointed out that changing the core of the Canadian-Indian Reactor (CIR) at Trombay every 6 months was "an exceptionally short period"[24] and expressed the possibility that India might be well into the nuclear weapons development program. It said, "a six-months period is the cycle best suited to produce weapons grade plutonium for a reactor of the CIR specifications."[25] While the report explicitly mentioned that there, so far, was no evidence that India started its weapons development program already, it did say, "The Indians are now in a position to begin nuclear weapons development if they choose

to do so" and that they have "available, on demand, unsafeguarded weapons-grade plutonium or, at the least, the capacity to produce it."[26] This report holds considerable importance in that it highlights several points that put under question the necessity or requirement of setting up of a Plutonium separation plant at Trombay. It points out that the Indian nuclear energy program was "an uneconomic investment", and that the country had "no clear-cut technical reasons, flowing out of India's currently planned nuclear power program, that would make a chemical separation plant essential."[27] India did not have any "known requirements for plutonium in the quantities that the plant can produce"[28] either. Moreover, "small quantities of plutonium for research can be obtained from a variety of sources at modest cost.", the report said.[29] Thus, in light of this evidence, it is worth questioning how much weight the Chinese explosion of the atomic bomb in 1964 actually had on India's own nuclear weapons test. Especially, when one always talks about India's nuclear test in the geopolitical aspect of the Chinese threat that allegedly loomed over India in the aftermath of the Chinese explosion.

Just one month after the Chinese explosion took place in 1964, K.R. Narayanan, then Director of the China Division at the Ministry of External Affairs (MEA), Government of India, wrote a secret document to the Joint Secretaries and the Ministers. Written on November 11, 1964, the document assessed the level of threat perception that China's nuclear test had on the Indian state. It weighed the consequences of the Chinese test on India's geo-political and strategic landscape. As it turns out, in the aftermath of China's nuclear test at Lop Nur, India found itself in a quandary, left with four choices: "(1) To agree to co-exist with China on Chinese terms; (2) to seek alliance and nuclear protection from the United States; (3) to organise world public opinion against China and to work for disarmament; and (4) to make our own nuclear weapons."[30] The document reveals that Narayanan did not see the importance of development of nuclear weapons then. However he said, "While it is not yet a military factor, it will be an important military factor after 10 or 20 years when China has developed a stockpile and a delivery system"[31], and favoured development of Indian nuclear program in future years.

A couple of years down the line, in May 1967, Indira Gandhi's Principal Secretary Lakshmi Kant Jha, submitted a report titled "Nuclear Policy".[32] This report suggested that China's use of nuclear weapons against India could be ruled out. Similar to the assessment made in regard to the nature of the Chinese

threat in 1973, this report limited Chinese threats to "pressure on the borders, threats of one kind or another, possible skirmishes and localised fighting"[33], and ruled out the possibility of full-scale invasion of India by China. In fact, Jha argued, "even if there was a full-scale war with China, I doubt if the Chinese would use nuclear weapons."[34] This was primarily because he believed that the principle of non-use of nuclear weapons against non-nuclear weapons states, which was developed post-World War II, shall bind China to not use nuclear weapons against India—a non-nuclear weapon state at the time of the production of the report. Moreover, his realism guided him to conclude that China would not use nuclear weapons against India as Beijing would be aware that such an eventuality shall invite retaliations by the US and the USSR, who would not stand by and watch nuclear wrath unfolding in Asia.[35]

As such, Jha recommended against the development of nuclear weapons by India at the time. He cited Indian economic constraints to support his argument. He said that given the advanced country that China was, it was "at least five years ahead" of India in "nuclear weapons and delivery system"[36]. If India had to "meet China militarily on the nuclear plane, the chances of our getting the worst of it would be very high."[37] Hence, he suggested the government to "remain non-nuclear for the present" even if it meant "living dangerously."[38] Jha was also apprehensive of nuclear guarantees provided by the US and the USSR to India in case India heralded its own nuclear development program. He argued that the development of nuclear weapons by India shall make the country a nuclear state which shall incite China and greatly undermine Chinese restraint of using nuclear weapons against India. It shall also weaken the nuclear guarantees provided by the US and the USSR to India in event of a Chinese nuclear attack on India.[39] He said, "the development of nuclear weapons by India would to my mind, greatly reduce the restraint on China using nuclear weapons against us and also weaken the political compulsions on the USA and USSR to come to our help in such an eventuality."[40] However, it is worth noting that in his recommendations to the Prime Minister, though he strongly argued against any changes in India's nuclear policy at that time, he stressed upon the fact that India should not shy away from developing nuclear weapons in the future. He said, "We should make it clear that we are not prepared to tie our hands in perpetuity against making nuclear weapons–guarantees or no guarantee."[41]

Yogesh Joshi (2015) talks about the Indian military threat perception in

1974-76 in one of the papers from the series of Working Papers published by the Nuclear Proliferation International History Project (NPIHP).[42] This paper refers to a report, called Apex Group I Report, which was produced in 1973 by a high-level panel committee led by the then Chairman of the Planning Commission D.P. Dhar. The objective of this report was to assess India's strategic environment and to compile and provide an account of defence expenditures to be incurred in the upcoming five years beginning 1974. The report which was prepared by a committee comprising of prominent stakeholders in India's defence policy[43] and approved by the Cabinet Committee on Political Affairs (CCPA) – India's highest decision-making body – on May 17, 1973, ruled out any direct threat from China. While acknowledging the existence of Chinese threat in terms of its material and political support to Pakistan and insurgencies in Northeastern parts of India, it said, "full scale land invasion of India from China can be ruled out."[44] It further added that the "use of atomic weapons by China can be ruled out".[45] According to the report, "Pakistan will resort to a surprise attack against India… at the points of her choosing" and that China will provide "collusive support" to Pakistan.[46] Thus, one can assess that at the time India tested its nuclear weapons in 1974, China only posed a threat to India insofar as the military hardware support it may provide in case of a Pakistani attack on India, while a direct invasion of India by China was found to be "unlikely".[47]

Quite evidently, even after China's nuclear test in 1964, India did not perceive an immediate nuclear threat from her neighbouring country. In fact, not much had changed in terms of Chinese threat perception in India over the course of around ten years since the Lop Nur test. While Indian statesmen and bureaucrats were in favour of India's development of nuclear weapons in the future, they ruled out any full-scale invasion of India by China. Furthermore, the use of atomic weapons against India by China was ruled out as highly unlikely in the near future. By looking at this evidence, in combination with the fact that India was already producing weapons-grade plutonium before the Chinese explosion, one can conclude that India's testing of its first nuclear bomb in 1974 was not a direct response to the Chinese nuclear test of 1964.

CURRENT NUCLEAR ARSENAL

India "maintains a culture of relative opacity"[48] towards its nuclear arsenal. Government officials seldom talk about the nation's nuclear capabilities or the

amount of funding spent on its nuclear program. Moreover, in 2016, the Indian government subjected Strategic Forces Command –an agency responsible for operating the country's nuclear arsenal– to the list of security organizations that are exempt from India's Right to Information Act[49], making it difficult for journalists, researchers, and the public to access critical information about India's nuclear arsenal. As such, no official information is available regarding the nuclear arsenal of India, however, some estimates suggest that India's nascent nuclear triad operates eight different nuclear-capable systems: two aircrafts, four land-based ballistic missiles, and two sea-based ballistic missiles. The estimates suggest that India is currently in possession of around 172 nuclear warheads, however, it has enough weapons-grade Plutonium to produce over 200 warheads.[50]

In addition, developments in India's nuclear stockpile suggest an important shift in India's nuclear strategy. Before March 11, 2024, "Indian missiles had only Pakistan within their range. Now, with a range of 5,000 to 8,000 kilometer (km), the nuclear-capable Agni V has Beijing, Shanghai, Guangzhou and Hong Kong within reach."[52] India currently "possesses five types of mobile land based, nuclear-capable ballistic missiles that appear to be operational: the short-range Prithvi-II and Agni-I, the medium-range Agni-II, and the intermediate-range Agni-III and Agni-IV. At least two other Agni missiles are in development and nearing deployment: the medium-range Agni-P and the intermediate-range Agni-V. A new intercontinental-range Agni-VI missile is also thought to be in the design stage, although its status is unclear."[53] While the short-range Prithvi-II and Agni-I missiles could deliver a warhead to distances of 350 and approximately 700 km respectively, the striking capability in terms of distance coverage has been strengthening with subsequent missile developments. For example, Agni-II, the intermediate-range missile and an improvement on Agni-I can cover a distance of more than 2,000 km. This brings western, central, and southern China inside the striking range of Agni-II.[54] Similarly, the deployment of Agni-III which can travel over 3,200 km, makes it the "first missile to bring Beijing within range of Indian nuclear weapons", and with the potential coverage of 3,500 km, Agni-IV is "capable of striking targets in nearly all of China from locations in northeastern India."[55] Furthermore, Agni-V, a near-intercontinental ballistic missile (ICBM), can cover a distance of less than 6,000 km. These extra range capabilities of Agni-III, Agni-IV, and Agni-V provide an added advantage of deploying these missile units away from the Chinese border, providing a strategic upper hand

to Indian authorities. The range of Agni-V, for example, allows the "Indian military to establish Agni-V bases in central and southern India, further away from the Chinese border."[56] Quite evidently, the primary focus of the Indian nuclear strategy has changed to China now. This claim stands further bolstered in light of the November 2021 statement by General Bipin Rawat, the then Indian Chief of Defence Staff, who said that China has become India's biggest security threat due to lack of trust and suspicion issues.[57] His apprehensions with respect to China had apparently stemmed from the 2017 Doklam standoff and another border dispute that broke out between Indian and Chinese soldiers in Galwan valley in the Indian territory of Ladakh in June 2020. The disputes are discussed in more detail in the subsequent section.

With the developments in the Indian nuclear arsenal, concerns abound in regard to India's original stated posture on its nuclear strategy. Frank O' Donnell and Yogesh Joshi write in their book *India and Nuclear Asia Forces, Doctrine, and Dangers*: "The emerging nuclear force structure appears to be moving away from the stated postures of credible minimum deterrence and assured retaliation".[58] New development projects like Multiple Independently Targeted Re-entry Vehicle (MIRV) technology which enables a missile to carry multiple warheads and increases the number of targets it can attack (e.g. the Agni-VI missile) indicates "Indian interest in a war-fighting capacity."[59] The 700-km-range Shourya nuclear missile, and the potentially nuclear-capable short-range Prahaar also "confer a war-fighting capability."[60]
As far as the future prospects of the Indian nuclear arsenal are concerned, as stated, India is currently developing the Agni VI missile, which is expected to be deployed in the year 2027. Moreover, six fast breeder reactors are also under construction by Indian engineers, expected to be near completion by 2033.[61] Experts say that India would need more warheads to arm the new missiles the country is currently developing,[62] but it remains to be seen what trajectory the development of India's nuclear arsenal takes from here.
The following section looks at the current Indian position vis-a-vis its No First Use (NFU) policy.

INDIA'S NO FIRST USE (NFU) DILEMMA: To be or not to be [63]

The South Asian region comprising India, Pakistan, and China is a nuclear hotspot. While Pakistan never had an NFU policy, India has maintained that posture ever since it tested its nuclear weapons in 1998. However, some recent

skirmishes between India and Pakistan, and India and China have aggravated the already existing concerns about the dangers of nuclear weapons in this theatre. Moreover, there have been indications of a shift in India's stance on NFU, which further complicates the situation.

In February 2019, India and Pakistan found themselves in a conflict when an Indian paramilitary police convoy was attacked in the Pulwama district of India-administered Kashmir by a Pakistan-based militant group, Jaish-e-Mohammad.[64] The skirmish that ensued brought the two close to a nuclear conflagration. It triggered the convening of the National Command Authority of Pakistan which is the body that is responsible for Pakistan's nuclear arsenal. Moreover, the India-Pakistan crisis had touched a new low when, in March 2022, India accidentally launched BrahMos – a nuclear capable, medium range ramjet supersonic cruise missile – 124 km into Pakistan's territory. The accidental launch, which India attributed to "technological malfunction" [65] inflicted damage to civilian property. However, according to officials from Pakistan, India neither alerted them using the high-level military hotline nor issued a public statement about the accident until two days later. In the absence of any such measures, "Pakistan reportedly suspended all military and civilian aircraft for nearly six hours and placed line bases and strike aircraft on high alert." [66] Similarly, India had a couple of disputes in recent years with China as well. In the summers of 2017, Indian and Chinese troops engaged in a two-month standoff in the Doklam area – a disputed area less than 100 square km in size, lying at the trijunction of India, China, and Bhutan. Doklam is a contentious land on which both China and Bhutan lay their claims, however, India supports Bhutan's claims. The controversial issue sparked again in 2017 when China attempted to extend a road southward in Doklam. India was concerned that "if the road is completed, it will give China greater access to India's strategically vulnerable "chicken's neck", a 20km wide corridor that links the seven north-eastern states to the Indian mainland." [67] Hence, the Indian soldiers, "at the request from Bhutan," [68] entered Bhutanese territory and stopped the Chinese road-building measures. The Indian and Chinese troops withdrew only after two months from the border. Similarly, another skirmish broke out between India and China in June 2020 along the Line of Actual Control (LAC) – an official line defining and differentiating Indian and Chinese territories. The 2020 skirmish, broken out along the Himalayan border, was borne out of a territorial dispute as India "accused China of sending thousands of troops into Ladakh's Galwan valley" and saying that

"China occupies 38,000sq km of its territory." [69] The unfortunate incident had precipitated into the death of at least 20 Indian and 4 Chinese soldiers, making the scuffle the first deadly clash between the two countries along the border in at least 45 years.[70] Because of such conflicts arising out of sensitive causes, the risk of conflict escalation in this theatre remains high. Looking at it in light of an increasing stockpile of Indian nuclear machinery, there is a constant fear amongst scholars that India might renounce its NFU policy. In fact, in 2003 India declared that it could potentially use nuclear weapons in response to chemical or biological attacks.[71] This has recently given rise to a discourse around India's 'conditional NFU' amongst scholars with some asserting, "India's NFU [no-first-use] policy is neither a stable nor a reliable predictor of how the Indian military and political leader-ship might actually use nuclear weapons".[72] Additionally, in 2016, the then Indian Defence Minister Manohar Parrikar, on the occasion of his book launch, said that India should not bind itself to the NFU policy. However later, he was quick to add that "it was my personal opinion."[73] Similarly in August 2019, Defence Minister of India Rajnath Singh attracted attention when he appeared to draw away from India's NFU stance. Mr. Singh was on a visit to Pokhran in commemoration of the first anniversary of the death of former Prime Minister of India, Atal Vihari Bajpayee, under whom the country had conducted its second nuclear tests in 1998. During this visit, Mr. Singh tweeted, "India has strictly adhered to this doctrine. What happens in the future depends on the circumstances."[74] It is interesting to note that his tweet came after the Pulwama Attack of February 2019[75], which suggested a shift in India's nuclear doctrine in light of changing security dynamics vis-à-vis her neighbouring nuclear armed countries. In light of all these developments, several scholars have pointed out a change in India's nuclear doctrine. Ankit Panda, Stanton Senior Fellow in the Nuclear Policy Program at the Carnegie Endowment for International Peace pointed out in his article that there is a change in India's nuclear doctrine from "no first use to no, first use".[76]

Given the non-maintenance of an NFU policy by Pakistan and an indication of a recent shift in India's NFU policy, it is extremely concerning that such skirmishes serve to be potential triggers for a nuclear war between the countries. Hence, there is an urgent need of further research into ways that can ensure nuclear disarmament, and/or non-proliferation of nuclear weaponry maintained by several countries. Measures that can guarantee peace in the region need to be ascertained at the earliest.

CONCLUSION

In regard to India's nuclear development program, it can be concluded that though India maintained that it was interested only in peaceful and civilian use of atomic energy, the closed-knit circle of top leaders and scientists knew that the development of nuclear weapons was inevitable. Many were party to India's attainment of its objectives. Homi J. Bhabha, who found himself at the helm of India's nuclear institution, played a monumental role in the process. The Nuclear Cooperation Agreement (1951) between India and France was key to India's nuclear activities and Bhabha played an important role in bringing that about as well.

As far as the contributing factors to India's nuclear weapons test of 1974 are concerned, China did not pose an immediate nuclear threat to Indian territories. However, in more recent times, with China laying claims on Indian territories and on areas strategically crucial to her with increasing frequency, China does emerge as a threat to India. As such, continuous developments in India's nuclear arsenal have been taking place which reflects a shift in India's nuclear strategy. Beijing appears to be the primary focus of this new strategy. In light of this, there is an urgent need for preventive diplomacy and crisis management in the South Asian region: an additional area of potential research.

Endnote

1. Dadabhoy, Bakhtiar K. "Homi Bhabha, Jawaharlal Nehru and the Bomb." TheWire, n.d., sec. Books. https://thewire.in/books/homi-bhabha-jawaharlal-nehru-and-the-bomb.

2. For more, read Homi J. Bhabha: A Life, a biography of Bhabha by Bakhtiar K. Dadabhoy. You can also read an excerpt here: https://thewire.in/books/homi-bhabha-jawaharlal-nehru-and-the-bomb

3. "India's Nuclear Weapons Program Smiling Buddha: 1974." Nuclear Weapon Archive, November 8, 2001. https://nuclearweaponarchive.org/India/IndiaSmiling.html.

4. "Homi Bhabha Indian Physicist." In Science & Tech, May 6, 2024. https://www.britannica.com/biography/Homi-Bhabha.

5. For reference look at the language used and the frequency of letter exchanges between the two- “Bhabha, Homi Jehangir 1909-1966.” In Wilson Center Digital Archive, n.d. https://digitalarchive.wilsoncenter.org/people/bhabha-homi-jehangir.

6. Bhabha, Homi Jehangir. “Letter from Homi Bhabha to Sir Dorab of Tata Trust.” In Wilson Center Digital Archive, May 24, 2012. https://digitalarchive.wilsoncenter.org/document/letter-homi-bhabha-sir-dorab-tata-trust.

7. Ibid

8. Perkovich, George. India’s Nuclear Bomb: The Impact on Global Proliferation. 1st ed. University of California Press, 1999.

9. Ibid

10. There was a lot of politics in international theatre surrounding India’s possession of strategic minerals. its mention can be found in Jayita Sarkar’s paper on nuclear cooperation between India and France. Sarkar, Jayita. “From the Peaceful Atom to the Peaceful Explosion: Indo-French Nuclear Relations during the Cold War, 1950–1974,” NPIHP Working Paper Series, September 2013. https://www.wilsoncenter.org/publication/the-peaceful-atom-to-the-peaceful-explosion.

11. However, one should note that the Atomic Energy Act was later revised upon the advancement of the Indian nuclear program into reactor design, construction, and advancement. Perkovich, George. India’s Nuclear Bomb: The Impact on Global Proliferation. 1st ed. University of California Press, 1999.

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13. Dadabhoy, Bakhtiar K. “Homi Bhabha, Jawaharlal Nehru and the Bomb.” TheWire, n.d., sec. Books. https://thewire.in/books/homi-bhabha-jawaharlal-nehru-and-the-bomb

14. Ibid

15. Sarkar, Jayita. “From the Peaceful Atom to the Peaceful Explosion:

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17. Even though the French scientists- Pierre and Marie Curie had done pioneering work in the field of nuclear research, their contributions had gone under-represented in the aftermath of Project Manhattan. Though there were 6 French nuclear scientists in the Manhattan project, France was out of the Allied bomb project as the Nazis had occupied French territory during WWII. ibid

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23. In June 1974, there was a change in the government and Valery Giscard d'Estaing was elected as President of the Fifth Republic of France. In line with his non-proliferation policy, he insisted on renegotiation of the agreements with India which eventually led to renegotiations of the 1972 agreement between India and France.

The 1972 agreement related to the fast breeder test reactor in Kalpakkam, India. CEA had attracted criticism for sending their congratulations to India but it maintained that the AEC and CEA share friendly relations and they are aware of the complexities of underground test that India had conducted. Hence, the CEA congratulates the AEC for the technological mastery. Sarkar, Jayita. "From the Peaceful Atom to the Peaceful Explosion: Indo-French Nuclear Relations during the Cold War, 1950–1974," NPIHP Working Paper Series, September 2013. https://www.wilsoncenter.org/publication/the-peaceful-atom-to-the-peaceful-explosion.

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Ministry of Personnel, Public Grievances and Pensions, India's Right to Information Act 2005 mandates timely response to citizen requests for government information. The basic objective of the Right to Information Act is to empower the citizens, promote transparency and accountability in the working of the Government, contain corruption, and make the Indian democracy work for the people in a real sense. https://rti.gov.in/

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