

INDIA'S NUCLEAR STRATEGY – A SURVEY

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By

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Preface

The present Ph.D. thesis, India's Nuclear Strategy – A survey seeks to explore and explain India's Nuclear strategy not only in the global context but regional context too.

There is no denying the fact that with the advancement of science and technology throughout the world, India also had to take up the line of nuclear strategy. In the sub-continent, India is confronted with a perennial problem of bitter relationship with Pakistan which occasionally oscillate between good and bad. Occasionally there has been endeavour on the part of both the countries to make a good relationship but for this or that it could not be materialised. Naturally, India had to develop her nuclear power, not only to get a better position in the world but also to get a leadership position in the sub continent.

Under the circumstances, taking into account, the advancement of the world, in the field of technology, India's strategy cannot be criticised. It is not for misuse but to gain a position in the world in terms of power politics.

However, attempt has been made to undertake the task of analysing India's nuclear strategy and different course of action. Lapses, if any, are mine.

I express my sincere gratitude for the guidance rendered by Dr. Manas Chakrabarty, my supervisor throughout the writing of the thesis. I am greatly indebted to my father for his constant inspiration for completing the project. I also record my cooperation extended by my wife and two daughters who were partly neglected by me during the period of my work.

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TABLE OF CONTENTS

Preface

Chapter : I

Evolution of India's Nuclear Programmes and Policies. 1

Chapter : II

Objectives of the Study 37

Hypothesis 37

Review of Literature 37

Methodology 40

Chapter : III

Evolution of Pakistan's Nuclear Programme 42

Chapter : IV

India and CTBT. 69

Chapter : V

Nuclear Related terms and Theories 76

Chapter : VI

India's Nuclear Doctrine and Its Emerging Nuclear Posture 94

Chapter: VII

Conclusion 114

Appendix

Annexure - I i

Annexure - II ix

Select Bibliography xii

Evolution of India's Nuclear Programmes and Policies

Introduction:

India's nuclear programme can be traced back to 1944 when the noted Indian physicist Homi J. Bhaba proposed to the Sorabji Tata Trust to set up an institute to train nuclear scientists who would in turn carry out extensive research on nuclear physics. The proposal had been prompted by Homi J. Bhaba, who had studied Enrico Fermi's experiment of a self sustaining chain reaction on a uranium core moderated by graphite rods and understood the future possibilities.¹ It was indeed a landmark in India's nuclear research advancement. Based on Bhaba's proposal, the Tata Institute of Fundamental Research was set up in 1945. This was the starting point of India's nuclear programme. In the initial stages, the programme was intended towards the use of nuclear energy for peaceful purposes. The reason as to the shift from one end of the spectrum to the other is manifold. Before we trace the history of India's nuclear development, the three schools of thought on India's nuclear programme may be listed. The conclusions as to which school of thought was correct would be very difficult to arrive at.

The Three Schools of Thought Regarding India's Nuclear Programme:

1. According to the first school of thought, India always kept its option of nuclearisation open, because it was a question of 'when' and not 'whether'.

1. Raja Menon, 'A Nuclear strategy for India', (New Delhi, Sage 2000), p. 66

Towards this end, the government and the scientists realised the military dimension of a nuclear programme and used the cover of use of nuclear energy for peaceful purposes as an excuse to continue research aimed at weaponisation.

2. The second school of thought is of the opinion that the approach of the nuclear Big 5, their stockpiling of weapons and their indifference to India's ethical and moral calling for global disarmament. US turning a blind eye to Pakistan's clandestine nuclear programme and the China factor forced India to change track from using nuclear energy for peaceful purposes for making atomic bombs.
3. The third school of thought, though distinctly lesser in number, is of the view that India's scientific community was a forceful impetus on India's decision makers in compelling India to go nuclear.

India's nuclear development can be examined through a study of different Phases.

- (1) Nehru's Era of Abstinence 1947 to 1960.
- (2) Era of Disenchantment 1961 to Pokhran I.
- (3) Era of Nuclear Ambiguity and Restraint 1975 to 1996.
- (4) Collapse of Ambiguity. Slippage into Deterrence, 1997 to Pokhran II.

Nehru's Era of Abstinence - 1947 to 1960:

India's first Prime Minister Pandit Nehru saw nuclear power in its peaceful capacity as providing India with the ability to leap from many technologies. His

vision for a modern, self-sufficient India included technological development. Nehru was strongly opposed India's nuclear weapon programme as was his closest confidant and advisor Krishna Menon. Both of them played an important part in shaping India's nuclear policy and its nuclear programme in the Nehruvian Era of abstinence. In fact, during Nehru era Indian nuclear advancement got an opening and momentum. As mentioned earlier, the Tata Institute of Fundamental Research had been set up in 1945 in Bombay. After independence, Bhabha convinced Nehru of the importance of atomic energy research in enabling India to build an industrial base to tackle the overwhelming problem of entrenched poverty. Bhabha's views impressed Nehru, who had a scientific bent of mind and was committed to abolishing poverty. Nehru believed that peaceful use of nuclear energy was the keystone in achieving this objective.

In late 1945 the Atomic Energy Commission was established under the Council of Scientific & Industrial Research. However, due to the efforts of Homi Bhabha, who wanted autonomy in functioning both the AEC and the Department of Atomic Energy which was established on 03 August 1954 became independent bodies with Homi Bhabha as the Chairman. Bhabha as the first head of the DAE zealously worked to preserve the organizational autonomy of India's nuclear energy estate. From the outset, the Indian Atomic Energy establishment, under the direction of the Prime Minister enjoyed a high degree of autonomy and was largely shielded from public scrutiny. Freeing the DAE and the AEC from scientific and administrative set up bureaucracy was a major achievement by itself. Bhabha was answerable only to Nehru. He could run both the DAE and the AEC professionally and without bureaucratic interference. This was one of the major

reasons attributed to the considerable progress made in this era in India's nuclear programme. The options of Nehru and Bhaba regarding nuclear weapons in this era are relevant to the development of India's programme.

Nehru always opposed the development of nuclear weapons in public view. His opposition to nuclear weapons was in accordance with his deep-rooted opposition to the use of force to solve international disputes. This conviction was also rooted in the Gandhian legacy of the Indian Nationalist Movement. Nehru's aversion to nuclear weapons was also due to his fear of the militarisation of the Indian society. He was firm in his belief that military spending in any form was a necessary evil.

It should be pointed out that in 1947, when India emerged as a free country; the nuclear age had already dawned. Development of nuclear technology of transformed the nature of global security. Our leaders reasoned that nuclear weapons were not weapons of war; these were weapons of mass destruction. A nuclear-weapon-free-world would, therefore, enhance not only India's security, but also the security of all nations. However, in the absence of universal and non-discriminatory disarmament, India could not accept a regime that created an arbitrary division between nuclear haves and have-nots. The basis of India's nuclear policy has remained global nuclear disarmament or equal and legitimate security for all.

In the 1950s, when nuclear weapons testing were taking place above ground, India took the lead in working for an end to all nuclear weapon testing as the first step for ending the nuclear arms race. In 1954, Jawaharlal Nehru called for negotiations for prohibition and elimination of nuclear weapons and in the interim,

a standstill agreement to halt nuclear testing. The world had, by then, witnessed less than 65 tests. Our call was not heeded. In 1963, an agreement was concluded to ban atmospheric testing but by this time, countries had developed the technologies for conducting underground nuclear tests and the nuclear arms race continued unabated. More than three decades and over 200 tests later, a Comprehensive Test Ban Treaty (CTBT) was opened for signature in 1996.

In 1965, along with a group of Non-Aligned countries, India mooted the idea, in the shadow of deepening security concerns, of an international non-proliferation agreement under which the nuclear weapon States would agree to give up their arsenals provided other countries refrained from developing or acquiring such weapons. The balance of rights and obligations was absent when the Nuclear Non-Proliferation Treaty emerged in 1968. India therefore made clear its inability to sign the NPT.

Our decision not to sign the NPT was in keeping with the basic objective of maintaining freedom of thought and action. In 1974, we demonstrated our nuclear capability. Successive governments thereafter continued to take necessary steps in keeping with that resolve to safeguard India's nuclear option. This was also the primary reason underlying the 1996 decision in the country not to subscribe to the CTBT. Our perception then was that subscribing to the CTBT would severely limit India's nuclear potential at an unacceptably low level. Our reservations deepened, as the CTBT did not also carry forward the nuclear disarmament process. On both counts, therefore, yet again, our security concerns remained unaddressed.

The decades of the 1980s and 1990s witnessed a further deterioration of our security environment as a result of nuclear and missile proliferation. A pattern

of clandestine acquisition of nuclear materials, missiles and related technologies also came into existence. India in this period became the victim of externally aided and abetted terrorism, militancy and clandestine war through hired mercenaries. Thus, while the end of the Cold war transformed the political landscape of Europe, it did little to address India's security concerns.

At the global level, there is no evidence yet on the part of the nuclear weapon States to take decisive and irreversible steps in moving towards a nuclear-weapon-free-world. Instead, the NPT has been extended indefinitely and unconditionally, perpetuating the existence of nuclear weapons in the hands of the five countries who are also permanent members of the UN Security Council. Some of these countries have doctrines that permit the first use of nuclear weapons. These countries are also engaged in programmes of modernization of their nuclear arsenals.

Under such circumstances, India was left with little choice. It has to take necessary steps to ensure that the country's nuclear option, developed and safeguarded over decades, was not eroded by a self-imposed restraint. At a time when developments in the area of advanced technologies are taking place at breathtaking pace, new parameters need to be identified, tested and validated in order to ensure that skills remains contemporary and succeeding generations of scientists and engineers are able to build on the work done by their predecessors. The limited series of five tests undertaken by India was precisely such an exercise. It has given India the requisite resources to ensure a credible deterrent.

These tests were not directed against any country. They only provide a reassurance to the people of India about their security. India remains fully

committed to the promotion of peace with stability, and resolution of all outstanding issues through bilateral dialogue and negotiations. We will continue to remain engaged in substantive dialogue with our neighbours to improve relations and to expand the scope of our interactions in a mutually advantageous manner. Confidence building is a continuous process; we remain committed to it. Consequent upon the tests and arising from an insufficient appreciation of our security concerns, some countries have been persuaded to take steps that sadden us. We value our bilateral relations. We remain committed to dialogue and reaffirm that preservation of India's security creates no conflict of interest with these countries.

Our nuclear policy has been marked by restraint and openness. It has not violated any international agreements either in 1974 or now, in 1998. Our concerns have been made known to our interlocutors in recent years. The restraint exercised for 24 years, after having demonstrated our capability in 1974, is in itself a unique example. Subsequent to the tests, the Government has already stated that India will now observe a voluntary moratorium and refrain from conducting underground nuclear test explosions. India has also indicated that it will not stand in the way of the entry into force of the CTBT by September 1999. India will also participate in negotiations in the Conference on Disarmament in Geneva on a Fissile Material Cut-off Treaty to prohibit future production of fissile materials for use in nuclear weapons or nuclear explosive devices.

India has maintained effective export controls on nuclear materials as well as related technologies, even though we are neither party to the NPT nor a member of the Nuclear Suppliers Group. In fact, India's conduct has been better than

some countries party to the NPT. India is committed to non-proliferation and the maintaining of stringent export controls to ensure that there is no leakage of our indigenously developed know-how and technologies.

India is a nuclear weapon State. This is a reality that cannot be denied. It is not a conferment that we seek; nor is it a status for others to grant. Our strengthened capability adds to our sense of responsibility. India has announced that it shall not be the first to use these weapons. These are weapons of self-defence to ensure that India is not subjected to nuclear threats or coercion. India shall not engage in an arms race nor reinvent the doctrines of the Cold War. India's nuclear doctrine would be based on a minimum but credible deterrent, no first use and a firm commitment to global elimination of nuclear weapons.

India has taken many initiatives in the past for the elimination of all nuclear weapons. It is our regret that these proposals did not receive a positive response from other nuclear weapon States. Had their response been positive, India need not have gone for the current tests. This is where our approach to nuclear weapons is different from others. This difference is the cornerstone of our nuclear doctrine. It is marked by restraint and striving for the total elimination of all weapons of mass destruction. We have been and will continue to be in the forefront of the calls for opening negotiations for a Nuclear Weapons Convention, so that this challenge can be dealt with in the same manner that we have dealt with the scourge of two other weapons of mass destruction, through comprehensive, universal and non-discriminatory treaties.

Nehru made a statement in 1957: "No man can prophecy the future. But I should like to say on behalf of any future government of India that whatever

might happen, whatever the circumstances, we shall never use this atomic energy for evil purposes". The statement was made at the inauguration of *Apsara*, India's first nuclear reactor at Trombay 20 January, 1957. It was a landmark in India's nuclear development.

Despite his public opposition to nuclear weapons, Nehru granted Bhaba a free hand in the development of India's nuclear infrastructure and sought to lay the necessary foundations should a political decision to acquire nuclear weapons be made. In a speech in 1946 in Bombay, Nehru stated "India will use atomic force for constructive purposes. But if India is threatened, she will inevitably try to defend herself by all the means at her disposal."² In pursuit of this end, Bhaba worked towards a complete mastery of the nuclear fuel cycle and a completely indigenous production process.

India's civilian nuclear energy programme has a 'dual use' or military capacity of which both Nehru and Bhaba were well aware. While Nehru was categorically opposed to the bomb, Bhaba was less rigid in his view and not opposed to a possible future bomb. Certain events would wide have a bearing on the nuclear programme of Indian in this era.

- ⇒ In the year 1953-54, nuclear supremacy of USA was broken by a Soviet thermonuclear test
- ⇒ In 1955-56, Pakistan agreed to join the CENTO.
- ⇒ Pakistan was given \$ 2 million, the first of many arms transfer for joining CENTO.

2. The Kargil Review Committee Report, (New Delhi; Sage 1999), p. 200.

- ⇒ In 1955 the Chinese Government announced a major Soviet-Chinese collaborative effort aimed at providing China with a reactor, a cyclotron, fissile materials and any number of experts.³
- ⇒ In 1956 China announced the construction of experimental reactors outside Beijing.
- ⇒ In April 1956 Moscow announced that it would build a 60000 KW nuclear reactor in China.
- ⇒ UK exploded its first hydrogen bomb in January 1957.

All these incidents dictated the need for a strong technical base for India. India's scientific community received extensive political support. The defence advisor to Britain, Lord PMS Blackett recommended to Nehru the setting up of a giant network of laboratories under CSIR.

The progress of India's distinguished period was slow but steady. The AEC set up the Rare Minerals survey unit in 1950 under Wadia, one of India's most famous geologists. The AEC also established the India Rare Earths Ltd. In 1952. Wadia's effort was primarily responsible for locating the uranium deposits in Jaduguda in 1952 and Narwapahar in 1963.⁴

India's thorium plant at Trombay went into production in 1955. The Canadians offered technology transfer under the Colombo Plan. Though the Indo-Canadian agreement had been signed only in April 1956. India's first nuclear reactor Apsara was commissioned in January 1957 by Nehru. In November 1958 India's

3. Leo Yueh-YunLiu, 'China as a Nuclear Power in the World', (London; Macmillan, 1972), p. 51.

4. Raja Menon. 'A Nuclear Strategy for India', (New Delhi: Sage 2000) p. 68.

Uranium processing plant was commissioned in Trombay and three months later pure uranium was being produced.

During this period, India under Nehru's stewardship was vigorously pursuing its fight against nuclear weapons in various international forum including the UN. This period could be characterized as one of intense idealism. Gandhi writing in the Harijan said 'I regard the employment of the atom bomb for the wholesale destruction of men, women and children as the most diabolical use of science'.⁵ In 1954 Nehru proposed the "Standstill Agreement" between the nuclear weapon states. In 1955 Nehru commissioned the Defence Service Organisation to study the consequences of nuclear weapons use. The findings of this committee were later presented to the UN General Assembly by Krishna Menon. During this period India presented eight disarmament initiatives either separately or jointly within various bodies of the UN.⁶

By mid to late 50s there was a slight shift in the Indian Government's position. These changes partly reflected the changes taking place in the international arena, which have been covered earlier. In essence, India's nuclear policy in Nehru's era of abstinence continued to be premised upon:

- ⇒ A sense of idealism that drew sustenance from Gandhi's belief of non-violence.
- ⇒ An understanding that nuclear weapons are an extension of the philosophy of violence and therefore need to be countered by nuclear disarmament.

5. Mahatma Gandhi. 'With an English Journalist', Harijan (New Delhi), 29 Sept. 1946.

6. Aabha Dixit. 'Status Quo: Maintaining Nuclear Ambiguity', India & the Bomb, (Notre Dame Press USA, 1996), p. 55.

- ⇒ A belief that peaceful uses of nuclear technology can benefit the community and therefore should be pursued with zeal.
- ⇒ A conviction that the pursuit of peaceful uses of nuclear technology, should remain within the domain of individual countries, with apex bodies like IAEA helping to promote and assist research on a non-discriminatory basis.

Phase II 1960 to Pokhran I

Era of Disenchantment:

The period from 1960 to 1974 can best be described as a period of disenchantment. India was disillusioned with the prospect of global disarmament. Two major factors shifted India's policy from a 'no bombs' to a 'no bombs now'. The events were.

- ⇒ 1962 Indo-China war.
- ⇒ Chinese nuclear test neither at Lap Nor on 16th October 1964.

In fact the second phase of India's nuclear programme started shortly after the Chinese test at Lap Nor.⁷ As early as 1958 Bhaba had conversation with a British physicist and defence advisor Lord PMS Blackett about his interest in the acquisition of nuclear weapons.⁸ Bhaba also declared before the Parliamentary Consultative Committee on Atomic Affairs in December 1959 that India had

7. Sumit Ganguly. 'Explaining Indian Nuclear Tests', India's Nuclear Strategy (New Delhi, Vistaar 2000) p. 41.

8. Sumit Ganguly., Ibid. p. 40.

progressed to a stage where, if a political directive was received a bomb could be made without external assistance. The time limit was not specified.⁹

In spite of all these slight shifts the predominant strand of opinion in the 50s and initial period of the 60s was against the weapon option. However, the 1962 Chinese aggression and China's nuclear test which followed thereafter had a profound impact on the psyche of Indian opinion makers and the political hierarchy.

By 1963 itself it was clear that China was rapidly moving to test a nuclear device. Eight months before the Chinese nuclear test at neither Lap nor, Homi Bhaba said at Pugwash Conference in Udaipur in January 1964 that "Nuclear weapons with an adequate delivery system can enable a state to acquire the capacity to destroy more or less totally the cities, industry and all important targets in another state. It is then largely irrelevant whether the state so attacked has greater destructive power at its command. With the help of nuclear weapons, therefore, a state may acquire what we may call a position of absolute deterrence even against another having many times greater destructive power under its control".¹⁰ Bhaba also went on to add that if any state be asked to renounce a possible dependence to redress the balance of power against a larger and more powerful state such as China, its security must be guaranteed by both the major powers.

Meanwhile, India signed the PTBT (Partial Test Ban Treaty), which came into force on 10 October 1963. The PTBT prohibited atmospheric tests. In

9. Raja Menon, *Ibid.* p. 71.

10. Homi J. Bhaba. 'Proceedings of the Twelfth Pugwash Conference', 1964, Udaipur, p. 75.

December 1963, India and US signed the agreement on the Tarapur Atomic Power Plant. The intensity of Indo-US cooperation under Kennedy prompted the export to India of the CDC-3600-140A Computer which could be used to simulate nuclear fission. In early May, Nehru made his last pronouncement on India's refusal to make a bomb but died three weeks later. The Chinese exploded their first bomb on 18 October 1964 at Lap Nor.

The Chinese nuclear explosions left the Indians with two opinions. First to go in for the bomb option and second to seek security guarantees from the other nuclear powers. Without going into the details, the nuclear powers declined to provide any sort of nuclear guarantees.

The NPT:

It is at this time that the Nuclear Non-Proliferation Treaty issue came up. India did not sign the NPT when it opened for signatures in 1968. The major reason for non-signature was China's decision not to sign and India's reluctance to commit itself in the absence of security guarantees. Also the political and scientific community were key factors in keeping the nuclear option open.

The refusal of the major nuclear powers to provided security guarantee and the various other factors at that time forced Lal Bahadur Shastri to sanction a proposal put forward by Bhaba to investigate a "Subterranean Nuclear Explosion Project".¹¹ The delay in conduct of a Peaceful Nuclear Explosion from 1965, when it was consented to by Shastri to 1974 when it finally occurred, can be attributed to the tendency to treat the nuclear weapon as a foreign policy issue

11. K. Subrahmanyam, 'Indian Nuclear Policy', 1964-98, Nuclear India, 1999.

and the failure to grasp the essentials of nuclear strategy arising from the use of the bomb as a weapon. Also there was a total lack of institutionalised thinking and multi-disciplinary inputs.¹² According to Sundarji the 'wait and watch' attitude could be attributed to a combination of three factors.

- ⇒ India's perception that in a bipolar world, with two super powers, any flexing of muscles by a regional small nuclear power like China was unlikely.
- ⇒ India's missile programme had not yet even commenced and air delivered nuclear weapons would have been out of range to the then Indian fighter-bombers.
- ⇒ The eroding but still present ideological drag induced by past pacifism coupled with lack of strategic thinking.¹³

The cold storage of the Subterranean Nuclear Explosion Project could also be attributed to the death of Homi Bhaba who died in air crash in 1966. After his death Vikram Sarabhai took over as the Secretary of the DAE and Chairman of AEC. Vikram Sarabhai was well known for his anti-bomb view and effected policies which ensured progress towards a PNE continued at an unhurried pace.

On the nuclear programme side the plutonium re-processing plant at Trombay was inaugurated their second nuclear bomb. Between May and December 1967, Chinese conducted four tests including a thermo-nuclear one. Another important event was the sanctioning of Purnima I nuclear reactor in 1967 and the

12. Raja Menon, *Ibid.*, p. 76.

13. K. Sundarji, 'India's Nuclear Weapon Policy, Nuclear Rivalry and International Order' (New Delhi, Sage, 1996) p. 174.

AEE under Sethna to build a reactor, located next to the plutonium facility. Purnima was the hub of training for most of the scientists who eventually participated in Pokhran I. The scientists included S N Seshadri, A K Ray and P R Roy and P K Iyengar. Purnima was the school that led both to Pokhran I and the research reactor Dhruva. Purnima was followed by Purnima II, III and Kamini all of which were

Made to explore the thorium route more scientifically. Purnima II went critical in May 1972 without any moderator.¹⁴

The 1965 Indo-Pakistan conflict had no bearing on India's nuclear programme except that during the was a hundred Congress MPs (Member of Parliament) signed a statement saying that India should make a nuclear bomb to avoid being overwhelmed by a Sino-Pakistan collusion. China launched its first satellite in 1970. In response to this event a symposium of scientists, political and defence analysts, economists and MPs was held in New Delhi. The symposium came to the conclusion that India had no option but to acquire nuclear weapons.¹⁵ In the early 70s, Vikram Sarabhai, Chairman AEC announced a balanced but modest 10 years profile for space and nuclear programmes including one or more peaceful nuclear explosions. The profile in brief is under¹⁶:

Space Technology Plans:

- ⇒ Fabrication of inertial navigation systems.
- ⇒ The construction of a rocket fabrication plant.

14. Raja Menon, Ibid., p. 80.

15. Hindustan Times, 10 May 1970.

16. Raja Menon, Ibid. p. 82.

⇒ Fabrication of satellites with the goal of launching an 80 kg. Satellite by 1975 and an 1800 kg. Satellite by 1985.

Nuclear Plans:

- ⇒ Installation of 1200 MW of power of 1980.
- ⇒ Construction of 500 MW FBR.
- ⇒ Development of gas centrifuges for enriching uranium.
- ⇒ Building of a nuclear fuel complex.

The slow but sure progress towards the pro bomb view was reinforced by the US tilt towards Pakistan in the Indo-Pak war of 1971. The entry of the nuclear-armed aircraft carrier USS Enterprise into the Bay of Bengal on 22 December 1971 was viewed by India as an attempt by US to use nuclear blackmail to end the conflict. President Nixon in an interview to Times magazine on July 4, 1985 admitted that he had considered using nuclear weapons during Indo-Pakistan war of 1971 had the Soviets intervened.¹⁷ these developments were amongst the deciding factors in India's security calculus that led to the peaceful nuclear explosion of 1974.

The idea of Pokhran I explosion was mooted by Raja Ramanna to Chidambaram in 1967 when Sarabhai was Chairman of the AEC and the SNEP was under official suspension.¹⁸ Plutonium was being processed in sufficient quantity by the plutonium processing facility, using spent rods from the Cirus, the nuclear reactor.

17. 'Time', July 29, p. 85.

18. Raja Menon, Ibid. p. 85.

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N. Seshagiri was directed by Sarabhai to prepare a cost benefit study for a PNE. This study was made available in 1971. The study supported the PNE.¹⁹ Thus as the 70s commenced India had the capability and motivation to conduct a nuclear test.

The hole for the PNE was dug late 1972/early 1973 and the device was actually ready by mid 1973. India carried out its first nuclear test on 18 May 1974. The blast produced a yield of 12 kilotons +/- 10 percent. In spite of the nuclear explosion there is little doubt that the Prime Minister Mrs. Indira Gandhi had no further nuclear ambitions in mind. The then Defence Minister Jagjivan Ram stated that the test had few or no military implications and was simply part of India's ongoing attempts to harness the peaceful uses of nuclear energy.²⁰

The Indian explanation for the test found few adherents abroad. Of the great powers only the French congratulated the Indians on their success of the first nuclear test. The Chinese and Soviet reaction were muted but critical. The US and Canada cut off nuclear cooperation with India. The US reaction was the most severe. It cut off nuclear fuel for Tarapur and voted against aid to India.

But far from crippling the Indian nuclear industry the sanction spurred the nuclear scientists who in late 1975 started work on the nuclear reactor Dhruva. Starting work on a 100 MW reactor at the height of sanctions speaks for the determination of the scientists who took the decision. The events from 1960 to Pokhran I indicates that Indian policy which was based on idealism and pacifism

19. N. Sahagiri, *The Bomb: Fallout of India's Nuclear Explosion*, (Delhi, Vikas 1995).

20. *New York Times*, May 23, 1974, p. 5.

was forced to move towards a PNE. At no point in time did India actively pursue a policy of nuclear bomb acquisition. India stuck to its policy and emphasized even after the PNE of 1974 that the explosion had no military dimensions.

1974-1976 Era of Nuclear Ambiguity and Restraint:

This period was characterized by both, ambiguity and restraint. Certain factors, which played an important part in shaping India's nuclear programme in this period, are:

- ⇒ Firstly, Pakistan accelerated its nuclear programme.
- ⇒ Secondly USSR's invasion of Afghanistan. This caused a dramatic shift in US-Pakistan relations due to which US turned a blind eye to Pakistan's clandestine nuclear programme.
- ⇒ Thirdly, China's covert support to Pakistan's clandestine nuclear programme.
- ⇒ Fourthly, Morarji Desai who was vehemently opposed to India acquiring nuclear weapons headed the coalition government formed in 1977.
- ⇒ Fifthly, the IGMDP (Integrated Missile Development Program), which commenced in 1983 under Dr. Abdul Kalam.
- ⇒ Sixthly, India's rejection of all regional approaches towards nuclear restraint and regional disarmament.
- ⇒ Seventhly, imposition of technology control regimes, which had the positive impact of spurring indigenisation.

The initial restraint immediately after the Pokhran I explosion could be attributed to two factors. One was the adverse international reaction and at another

level the robust Indo-Soviet strategic relationship based on Indo-Soviet Friendship treaty of 1971 assuaged India's security concerns. This period of restraint continued up to mid-80s. In 1983 there was growing evidence of Chinese support to Pakistan's clandestine nuclear weapons programme. Yakub Khan was present at the Lap or Nuclear Test and US intelligence reported the transfer of a complete bomb design from China to Pakistan. The bomb design and enough uranium for two-implosion devices were enough for a 20 to 25 kt. Yield and weighed 400 kg.²¹

On the scientific and technological front there was considerable progress. India's attempt to develop centrifuge capability materialised with enrichment plants being build at Trombay and Mysore. In July 1982 another enrichment plant was commissioned at Kalpakkam and in September 1982 the Mysore plant was producing uranium of 30% purity. In late 1983 the IGMDP was launched with Abdul Kalam at its head. The guts of India's weapons making programme was firmly established when Dhruva, India's nuclear reactor became operational in 1985.

During the period 1983-1993 India rejected a total of seven proposals by Pakistan for nuclear restraint and regional disarmament. However India joined the Five Continent Six Nation Initiative for Nuclear Disarmament in 1986 and signed the 'Delhi Declaration' for a nuclear weapons free world with Gorbachev the same year.

India also put forward the Rajiv Gandhi Plan for total elimination of nuclear weapons in the UN General Assembly's Fourth Special Session on Disarmament in 1988. Though this was a serious and well-conceived plan it was not pursued by

21. US Report <http://cns.miisedu/india/china/npakchr.htm>.

the Western powers after its presentation. All the above events forced the Indian Prime Minister Rajiv Gandhi to give a fresh look to the Indian bomb programme. In 1987 the US Press and Intelligence reported sale of M-11 missiles by China to Pakistan and these were reported arriving in crates in Karachi harbour. Troubled by these events and growing concern for India's security concerns with Pakistan moving rapidly towards a bomb capability, Rajiv Gandhi is reported to have given the go ahead for Indian bomb programme in 1988.²²

The collapse of Soviets in 1991 had profound implications for India's security and hence for its nuclear policies. It resulted in the loss of a critical counter weight to the Chinese threat. Russia was too debilitated to provide much assistance to India. Narasimha Rao's government in 1991 was an indecisive one. Pressures were moulding on India to sign the CTBT.

The Nuclear Test:

The extension of the NPT, the passage of Brown Amendment in 1995, which led to a renewal of up to \$ 368 million in US military assistance to Pakistan, provoked India's security concerns. India was anxious of the pressures it would face.

In the wake of extension of the NPT. Also moves towards the finalisation of the CTBT were also underway at Geneva. The Indian Government believed its window of opportunity to test was rapidly closing. In the politico strategic context Prime Minister Narasimha Rao permitted preparations for carrying out a nuclear test in December 1995. US Ambassador to India prevailed upon Prime Minister Narasimha Rao, who is well-known for his indecisiveness to call off the tests.²³

22. Raja Menon, *ibid*, p. 97 and Sumit Ganguly, *ibid*, p. 51.

23. *Science and Global Society* 6 (1996) pp. 101-189.

On the nuclear and missile development front, steady progress was being made. In February 1988, the SSM *Prithvi* was launched by India. It had a payload of 1000 kg, a range of 150 km and a CEP (Circular Error of Probability) of 200 metres. India tested its IRBM *Agni* in May 1989. The *Agni* was designed for a 1000 kg payload and had a range of 1000 km. The US reacted by revoking an earlier decision to supply the CAVTS (Combined Acceleration and Vibration Testing System). This system is required to qualify missile components against failure in simulated missile flight conditions. The Indians overcame this hurdle by producing indigenously. The US also refused transfer of the CRAY computer. The Indians produced an equivalent indigenously and responded by test firing the *Agni* for a second time in May 1992.

1997 to Pokhran II – Collapse of Ambiguity: Slippage into Nuclear Deterrence:

The three-year limit of signing the CTBT was to expire in September 1999. The Indian government was considering the option of testing once again based on the advice of the MEA (Ministry of External Affairs) and other think tanks.

On the technological side, a 930 kg. Satellite was launched by the PSLV in March 1996. This put a remote sensing Satellite into orbit from Sriharikota. The resolution of this Satellite would enable India to monitor both China and Pakistan's missile sites. In January 1998 India announced a deal with Russia for two 1000 MW reactors for the Kundankulam Power Project, the first nuclear power project in over a decade. On the political front, the BJP emerged as the largest single party in the national elections in March 1998 and assumed power with the support of a number of regional parties. In its elections manifesto, the BJP had spoken of

the perceived need to induct nuclear weapons into India's arsenal as well as to conduct a 'strategic review' of India's security environment. With this background and the substantial scientific, military and public support for the nuclear programme, India was waiting for a useful catalytic event to break from its long-standing policy of nuclear abstinence. The awaited moment came when Pakistan tested its IRBM *Ghauri* on 6th April 1998. The *Ghauri* had a range of 1500 km and could carry a 750 kg payload. Its range enabled Pakistan to target 26 Indian cities. The 1997 Ministry of Defence's annual report had expressed serious misgivings about China's support for Pakistan's nuclear and ballistic missile programmes. The testing of *Ghauri* by Pakistan provoked India's security concerns and was one of the main causes for India to carry out its Pokhran II explosion.

Between 11 and 13 May 1998 India exploded five weapons of 12 kt, 45 kt and three sub kilo ton shots of 0.2, 0.3 and 0.6 kilo tons. By so doing it crossed the nuclear Rubicon and set off a chain of events and different possibilities for the future, which are discussed in subsequent chapters.

To sum up in 1947, when India emerged as a free country to take its rightful place in the comity of nations, the nuclear age had already dawned. Our leaders then took the crucial decision to opt for self-reliance, and freedom of thought and action. We rejected the Cold War paradigm whose shadows were already appearing in the horizon and instead of aligning ourselves with either bloc, chose the more difficult path of non-alignment. This has required the building up of national strength through our own resources. Our skills and creativity and the dedication of the people. Among the earliest initiatives taken by our first Prime

Minis Pt. Jawaharlal Nehru, was the development of science and inculcation of the scientific spirit. It is this initiative that laid the foundation for the achievement of 11 and 13 May made possible by exemplary cooperation among the scientists from Department of Atomic Energy and Defence Research & Development Organisation. Disarmament was then and continues to be a major plank in our foreign policy now. It was, in essence, and remains still, the natural course for a country that had waged a unique struggle for independence on the basis of '*ahimsa*' and '*satyagraha*'.

Department of nuclear technology transformed the nature of global security. Our leaders reasoned that nuclear weapons were not weapons of war, these were weapons of mass destruction. A nuclear weapon-free-world, therefore, enhance not only India's security but also the security of all nations. This is the principle plank of our nuclear policy. In the absence of universal and non-discriminatory disarmament, we cannot accept a regime that creates an arbitrary division between nuclear haves and have-nots. India believes that it is the sovereign right of every nation to make a judgement regarding its supreme national interests and exercise its sovereign right. At the same time, our leaders recognized early that nuclear technology offers tremendous potential for economic development, especially for developing countries that are endeavouring to leap across the technology gaps created by long years of colonial exploitation. This thinking was reflected in the enactment of the Atomic Energy Act of 1948, within a year of our independence. All the numerous initiatives taken by us since, in the field of nuclear disarmament have been in harmony and in continuation of those early enunciations.

In the 50's, nuclear weapons testing took place above ground and the characteristic mushroom cloud became the visible symbol of the nuclear age. India then took the lead in calling for an end to all nuclear weapon testing as the first step for ending the nuclear arms race. Addressing the Lok Sabha on 6 April 1954, shortly after a major hydrogen bomb test had been conducted. Pt. Jawaharlal Nehru stated that "nuclear, chemical and biological energy and power should not be used to forge weapons of mass destruction". He called for negotiations for prohibition and elimination of nuclear weapons and in the interim, standstill agreement to halt nuclear testing. The world had by then witnessed less than 65 tests. Our call was not heeded. In 1963, an agreement was concluded to ban atmospheric testing but by this time, countries had developed the technologies for conducting underground nuclear tests and the nuclear arms race continued unabated. More than three decades passed and after over 2000 tests had been conducted, a Comprehensive Test Ban Treaty was opened for signature in 1996, following two and a half years of negotiations in which India had participating actively. In its final shape, this Treaty left much to the desired. It was neither comprehensive nor was it related to disarmament.

In 1965, along with a small group of non-aligned countries, India had put forward the idea of an international non-proliferation agreement under which the nuclear weapons states would agree to give up their arsenals provided other countries refrained from developing or acquiring such weapons. This balance of rights and obligations was absent when the Nuclear Non-Proliferation Treaty (NPT) emerged in 1968, almost 30 years ago. In the 60's our security concerns deepened. But such was our abhorrence of nuclear weapons and such our desire

to avoid acquiring them that we sought instead security guarantees from major nuclear powers of the world. The countries we turned to for support and understanding felt unable to extend to us the assurances that we then sought. That is when and why India made clear its inability to sign the NPT.

The Lok Sabha debated the NPT on 5 April 1968. The then Prime Minister late Smt. Indira Gandhi assured the House that “we shall be guided entirely by our self-enlightenment and the considerations of national security”. She highlighted the shortcomings of the NPT whilst re-emphasising the country’s commitment to nuclear disarmament. She warned the House and the country “that not signing the Treaty may bring the nation many difficulties. It may mean the stoppage of aid and stoppage of help. Since we are taking this decision together, we must all be together in facing its consequences”. That was a turning point. This House then strengthened the decision of the Government by reflecting a national consensus.

Our decision not to sign the NPT was in keeping with the basic objective of maintaining freedom of thought and action. In 1974, we demonstrated our nuclear capability. Successive Governments thereafter have continued to take all necessary steps in keeping with that resolve and national will, to safeguard India’s nuclear option. This was also the primary reason underlying the 1996 decision in the country not subscribing to the Comprehensive Test Ban Treaty (CTBT); a decision that met the unanimous approval of the House yet again. Our perception then was that subscribing to the CTBT would severely limit India’s nuclear potential at an unacceptably low level. Our reservations deepened as the CTBT did not also carry forward the nuclear disarmament process. On both counts, therefore, yet

again our security concerns remained unaddressed. The then Minister for External Affairs, Shri I.K. Gujral had made clear the Government's reasoning to this House during the discussions on this subject in 1996.

The decades of the 80's and 90's meanwhile witnessed the gradual deterioration of our security environment as a result of nuclear and missile proliferation. In our neighbourhood, nuclear weapons increased and more sophisticated delivery systems were inducted. Further, in our region there has come into existence a pattern about clandestine acquisition of nuclear materials, missiles and related technologies. India, in this period, became the victim of externally aided and abetted terrorism, militancy and clandestine war through hired mercenaries.

The end of the Cold war marks a watershed in the history of the 20th century. While it has transformed the political landscape of Europe, it has done little to address India's security concerns. The relative order that was arrived at in Europe was not replicated in other parts of the globe.

At the global level, there is no evidence yet on the part of the nuclear weapon states to take decisive and irreversible steps in moving towards a nuclear-weapon-free-world. Instead, the NPT has been extended indefinitely and unconditionally, perpetuating the existence of nuclear weapons in the hands of the five countries who are also permanent members of the UN Security Council. Some of these countries have doctrines that permit the first use of nuclear weapons; these countries are also engaged in programmes for modernisation of their nuclear arsenals.

Under such circumstances, India was left with little choice. It had to take necessary steps to ensure that the country's nuclear option, developed and safeguarded over decades not be permitted to erode by a voluntary self-imposed restraint. Indeed, such an erosion would have had an irretrievably adverse impact on our security. The Government was thus faced with a difficult decision. The only touchstone that guided it was national security. Tests conducted on 11 and 13 May are a continuation of the policies set into motion that put this country on the path of self-reliance and independence of thought and action. Nevertheless, there are certain moments when the chosen path reaches a fork and a decision has to be made. 1968 was one such moment in our nuclear chapter as were 1974 and 1996. At each of these moments, we took the right decision guided by national interest and supported by national consensus. 1998 was borne in the crucible of earlier decisions and made possible only because those decisions had been taken correctly in the past and in time.

At a time when developments in the area of advanced technologies are taking place at a breathtaking pace, new parameters need to be identified, tested and validated in order to ensure that skills remain contemporary and succeeding generations of scientists and engineers are able to build on the work done by their predecessors. The limited series of five tests undertaken by India was precisely such an exercise. It has achieved its stated objective. The data provided by these tests is critical to validate our capabilities in the design of nuclear weapons of different yields for different applications and different delivery systems. Further, these tests have significantly enhanced the capabilities of our scientists and engineers

in computer simulation of new designs and enabled them to undertake sub-critical experiments in future, if considered necessary. In terms of technical capability, our scientists and engineers have the requisite resources to ensure a credible deterrent.

Our policies towards our neighbours and other countries too have not changed; India remains fully committed to the promotion of peace with stability, and resolution of all outstanding issues through bilateral dialogue and negotiations. These tests were not directed against any country; these were intended to reassure the people of India about their security and convey determination that this Government, like previous Governments, has the capability and resolve to safeguard their national security interests. The Government will continue to remain engaged in substantive dialogue with our neighbours to improve relations and to expand the scope of our interactions in a mutually advantageous manner. Confidence building is a continuous process, we remain committed to it. Consequent upon the tests and arising from an insufficient appreciation of our security concerns, some countries have been persuaded to take steps that sadden us. We value our bilateral relations. We remain committed to dialogue and reaffirm that preservation of India's security creates no conflict of interest with these countries.

India is a nuclear weapon state. This is a reality that cannot be denied. It is not a conferment that we seek; nor is it a status for others to grant. It is an endowment to the nation by our scientists and engineers. It is India's due, the right of one-sixth of humankind. Our strengthened capability adds to our sense of

responsibility; the responsibility and obligation of power. India, mindful of its international obligations, shall not use these weapons to commit aggression or to mount threats against any country; these are weapons of self-defence and to ensure that in turn, India is also not subjected to nuclear threats or coercion. In 1994, we had proposed that India and Pakistan jointly undertake not to be the first to use their nuclear capability against each other. The Government on this occasion reiterates its readiness to discuss a “no-first-use” agreement with that country, as also with other countries bilaterally, or in a collective forum India shall not engage in an arms race. India shall also not subscribe to reinvent the doctrines of the Cold War. India remains committed to the basic tenet of our foreign policy – a conviction that global elimination of nuclear weapons will enhance its security as well as that of the rest of the world. It will continue to urge countries, particularly other nuclear weapon states to adopt measures that would contribute meaningfully to such an objective.

A number of initiatives have been taken in the past. In 1978, India proposed negotiations for an international convention that would prohibit the use or threat of use of nuclear weapons. This was followed by another initiative in 1982 calling for a ‘nuclear freeze’ – a production of nuclear weapons, and related delivery systems. In 1988, we put forward an Action Plan for phased elimination of all nuclear weapons within a specified time frame. It is our regret that these proposals did not receive a positive response from other nuclear weapon states. Had their response been positive, India need not have gone for the current tests. This is where our approach to nuclear weapons is different from others. This difference

is the cornerstone of our nuclear doctrine. It is marked by restraint and striving for the total elimination of all weapons of mass destruction.

We will continue to support such initiatives, taken individually or collectively by the Non-Aligned Movement, which has continued to attach the highest priority to nuclear disarmament. This was reaffirmed most recently, last week, at the NAM Ministerial meeting held at Cartagena, which has “reiterated their call on the Conference on Disarmament to establish, as the highest priority, an ad hoc committee to start in 1998 negotiations on a phased programme for the complete elimination of nuclear weapons with a framework of time, including a Nuclear Weapons Convention”. The collective voice of 113 NAM countries reflects an approach to global nuclear disarmament to which India has remained committed. One of the NAM member initiatives to which we attach great importance was the reference to the international Court of Justice resulting in the unanimous declaration from the ICJ, as part of the Advisory Opinion handed down on 8 July, 1996, that “there exists an obligation 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”. India was one of the countries that appealed to the ICJ on this issue. No other nuclear weapon state has supported this judgement; in fact, they have sought to decry its value. We have been and will continue to be in the forefront of the calls for opening negotiations for a Nuclear Weapons Convention, so that this challenge can be dealt with the scourge of two other weapons of mass destruction – through the Biological Weapons Convention and the Chemical Weapons Convention. In keeping with our commitment to comprehensive, universal and non-discriminatory approaches to disarmament,

India is an Original State Party to both these Conventions. Accordingly, India will shortly submit the plan of destruction of its chemical weapons to the international authority – Organisation for the Prohibition of Chemical Weapons. We fulfil our obligations whenever we undertake them.

Traditionally, India has been an outward looking country. Our strong commitment to multilateralism is reflected in our active participation in organisations like the United Nations. In recent years, in keeping with the new challenges, we have actively promoted regional cooperation – in SAARC, in the Indian Ocean Rim-Association for Regional Cooperation and as a member of the ASEAN Regional Forum. This engagement will also continue. The policies of economic liberalisation introduced in recent years have increased our regional and global linkages and the Government shall deepen and strengthen these ties.

Our nuclear policy has been marked by restraint and openness. It has not violated any international agreements either in 1974 or now. In 1998. Our concerns have been made known to our interlocutors in recent years. The restraint exercised for 24 years, after having demonstrated our capability in 1974, is in itself a unique example. Restraint, however, has to arise from strength. It cannot be based upon indecision or doubt. Restraint is valid only when doubts are removed. The series of tests undertaken by India have led to the removal of doubts. The action involved was balanced in that it was the minimum necessary to maintain what is an irreducible component of our national security calculus. This Government's decision has, therefore to be seen as part of a tradition of restraint that has characterised our policy in the past 50 years.

Subsequent to the tests Government has already stated that India will, now observe a voluntary moratorium and refrain from conducting underground nuclear test explosions. It has also indicated willingness to move towards a de-jure formalisation of this declaration. The basic obligation of the CTBT is thus met, to refrain from undertaking nuclear test explosions. This voluntary declaration is intended to convey to the international community the seriousness of our intent for meaningful engagement. Subsequent decision will be taken after assuring ourselves of the security of the country.

India has also indicated readiness to participate in negotiations in the Conference on Disarmament in Geneva on a Fissile Material Cut-off Treaty. The basic objective of this treaty is to prohibit future production of fissile materials for use in nuclear weapons or nuclear explosive devices. India's approach in these negotiations will be to ensure that this treaty emerges as a universal and non-discriminatory treaty, backed by an effective verification mechanism. When we embark on these negotiations, it shall be in the full confidence of the adequacy and credibility of the nation's weaponised nuclear deterrent.

India has maintained effective export controls on nuclear materials as well as related technologies even though we are neither a party to the NPT nor a member of the Nuclear Suppliers' Group. Nonetheless, India is committed to non-proliferation and the maintaining of stringent export controls to ensure that there is no leakage of our indigenously developed know-how and technologies. In fact, India's conduct in this regard has been better than some countries party to the NPT.

India has in the past conveyed our concerns on the inadequacies of the international nuclear non-proliferation regime. It has explained that the country was not in a position to join because the regime did not address our country's security concerns. These could have been addressed by moving towards global nuclear disarmament, our preferred approach. As this did not take place, India was obliged to stand aside from the emerging regime so that its freedom of action was not constrained. This is the precise path that was continued to be followed unwaveringly for the last three decades. That same constructive approach will underline India's dialogue with countries that need to be persuaded of our serious intent and willingness to engage so that mutual concerns are satisfactorily addressed. The challenge to Indian statecraft is balancing and reconciling India's security imperatives with valid international concerns in this regard.

The House is aware of the different reactions that have emanated from the people of India and from different parts of the world. The overwhelming support of the citizens of India is a source of strength for the Government. It not only tells that this decision was right but also that the country wants a focused leadership, which attends to national security needs. This, the Government pledges to do as a sacred duty. The Government has also been greatly heartened by the outpouring of support from Indians abroad. They have, with one voice, spoken in favour of the Government's action. The Government conveys its profound gratitude to the citizens of India and to Indians abroad, and looks to them for support in the difficult period ahead.

In this, the fiftieth year of our independence, India stands at a defining moment in our history. The rationale for the Government's decision is based on the same

policy tenets that have guided the country for five decades. The policies were sustained successfully because of the underlying national consensus. The present decision and future actions will continue to reflect a commitment to sensibilities and obligations of an ancient civilisation, a sense of responsibility and restraint, but a restraint born of the assurance of action, not of doubts or apprehension. The *Gita* explains (Chapter VI-3) as none other can.

However, India's nuclear doctrine can be summarized as follows:

- (i) Building and maintaining a credible minimum deterrent;
- (ii) A posture of "No First Use": nuclear weapon will only be used in retaliation against a nuclear attack on Indian Territory or on Indian forces anywhere;
- (iii) Nuclear retaliation to a first strike will be massive and designed to inflict unacceptable damage;
- (iv) Nuclear retaliatory attacks can only be authorised by the civilian political leadership through the Nuclear Command Authority;
- (v) Non-use of nuclear weapons against non-nuclear weapon states;
- (vi) However, in the event of a major attack against India, or Indian forces anywhere, by biological or chemical weapons, India will retain the option of retaliating with nuclear weapons;
- (vii) A continuance of strict controls on export of nuclear and missile related materials and technologies, participation in the Fissile Material Cut-off Treaty negotiations, and continued observance of the moratorium on nuclear tests;

(viii) Continued commitment to the goal of a nuclear weapon free world, through global, verifiable and non-discriminatory nuclear disarmament.

The Nuclear Command Authority comprises a Political Council and an Executive Council. The Prime Minister chairs the Political Council. It is the sole body, which can authorize the use of nuclear weapons.

The National Security Advisor chairs the Executive Council. It provides inputs for decision-making by the Nuclear Command Authority and executes the directives given to it by the Political Council.

Chapter - II

Objectives of the study

- ◆ To analyse what impelled India and Pakistan to nuclearise.
- ◆ To examine the theory of deterrence and related nuclear terms.

Patah Zarah, 'Pakistan's Elusive Search for Parity with India's Nuclear Security'
(New Delhi: Vistaar, 2000, p. 1)

- ◆ To analyse India's nuclear doctrine and its emerging nuclear strategy.

Hypothesis:

H.1. Indian nuclear programme from its very inception had a military dimension.

H.2. India's nuclearisation will lead to an arms race in South Asia.

H.3. Acquisition of nuclear weapons both countries have made South Asia a nuclear flash point.

Review of Literature:

The review of related literature has been divided into two categories:

- Literature reviewed in an attempt to understand why India went nuclear. India's nuclear doctrine and whether the emerging nuclear strategy is in keeping with its stated nuclear doctrine.
- Literacy reviewed to gauge the emerging trends in the nuclear standoff, these being indicative of the nuclear future of South Asia.

Some of the writings reviewed in this study are as under:

“Nuclear Politics in South Asia” by B.M. Jain:

In this book published on 1994 the author makes a significant departure from the usual panacea offered to Indo-Pak nuclear issues. He puts across the psycho-cultural approach as an alternate paradigm to deal with the problem of proliferation. He opines that the psycho cultural approach is a cognitive process that is useful in the alteration of prior beliefs, prejudices and misperceptions. Though offered as a paradigm to prevent proliferation, the approach is relevant even in the present scenario, in efforts being undertaken to make South Asia nuclear weapon safe.

“India and the Bomb: Public opinion and nuclear option.” Edited by David Cortright and Amitabh Mattoo:

This book consists of a collection of essays by eminent authors and experts. Initially published in 1996, four authors examine the following nuclear options that were available for India in 1996.

- ▼ Maintaining nuclear ambiguity.
- ▼ Abstinence.
- ▼ Non-weaponised deterrence.
- ▼ Going nuclear.

It is the fourth option, which is of relevance in the present study. After analysing the various factors, Varun Sahni had opted for the non-weaponised deterrent as the most viable, if India decided to exercise the nuclear option any time in the future.

“Nuclear Weapons: Policy Options for India” by Bhabani Sen Gupta and Centre for Policy Research, New Delhi:

Though published in 1983, the book is relevant to the present study as the book was a pioneering work at the time when the nuclear debate was hardly the issue it is today. The imaginary posture statement for 2000 A.D. in the book predicts China’s and Pakistan’s probable nuclear arsenal in 2000 A.D. Predictions of developments of Anti missile systems are noteworthy as these weapon-systems may be developed in case of an arms race in South Asia.

“India and the Nuclear Challenge” by K. Subrahmanyam:

The author stresses the rationale for a pro-active nuclear strategy for India that would be able to defy the pressures and challenges of the discriminatory global nuclear regimes. He asserts the right of India to evolve its nuclear policy options independent of other pressures.

“Strategic Compulsions of Nuclear India.” By Ravi Nanda:

The author justifies the Indian decision to go nuclear. It gives a detailed account of nuclear development in India and the need to set up a strategic command.

“Blind Men of Hindoostan” by Gen. K. Sundarji:

This book was a land in nuclear writing. Gen. Sundarji, while not a professed hawk, was definitely pro bomb. His book holds the startling view that India must welcome Pakistan going nuclear as India would be better equipped to deal with a nuclearised Pakistan than a Pakistan with bombs in the basement. Most of the

predictions of 1993, when the book was published, are coming true as present events unfold. The book advocated the concept of minimum deterrence for India.

“India’s emerging Nuclear Posture” by Ashley J. Tellis:

Easily, one of the most comprehensively researched books on India’s nuclear strategy. It describes India’s emerging nuclear posture in the context of a broader assessment of its strategic interest’s institutional structures and security goals. Published in 2001 by the Rand Corporation, USA.

“A Nuclear Strategy for India” by Rear Admiral Raja Menon (Retd.):

A very well researched and in depth analysis of India’s emerging nuclear strategy. The book fills a gap it enlightened writing on nuclear strategy. The author vehemently argues for the need of institutionalised nuclear thinking. He is the only contemporary analyst who favours the ‘triad’ for minimum deterrence as compared to most others who opine that submarine based nuclear weapons will trigger off an arms race in South Asia.

Methodology

The research methodology adopted has been descriptive analytical and not experimental, aimed at stunning the nuclear environment in South Asia, particularly, the nuclear weapon programmes of India and Pakistan and their related doctrine and strategy.

The method utilised to collect data from primary sources are government publications, talks with persons involved with nuclear weapon development and formulation of doctrine, both from the civil and the military. The inherent advantage the author had is that is a serving officer of NCC (Army) infantry

regiment which has given him an exposure to observe the employment and deployment of tactical missiles in the field and insight into the basics of missile technology. The secondary data was collected from books, journals, newspapers and World Wide Web.

Evolution of Pakistan's Nuclear Programme

Pakistan's nuclear programme began with the setting up of the Pakistan Atomic Energy Committee in 1955. In March 1956, the Pakistan Government established the Atomic Energy Council, which consisted of a governing body and the Pakistan Atomic Energy Commission. The earliest speculations that Pakistan's nuclear energy programme was not meant solely for peaceful purposes surfaced around 1960 when the US was propagating its "Atoms for Peace" programme worldwide.¹

Though the idea of a Pakistani nuclear weapons programme supported by US in the 60s seems far fetched, there is some logic in the US attempting to develop in Pakistan, a minimum level of theoretical expertise and basic understanding of how to run dual-use programme of power and research reactors as a deterrent against China. As to how this went totally against US' interest of non-proliferation later will become clear later in the chapter.

The actual impetus for Pakistan's nuclear development came actually in 1972. Pakistan's crushing defeat in the 1971 war and India's close ties with USSR prompted Pakistan to actively pursue the bomb option. Bhutto who was the Prime Minister of Pakistan in 1972 is acknowledged worldwide as the architect of Pakistan's nuclear bomb.

1. Bidwai and Vanaik, 'South Asia on a Short Fuse' (Oxford University Press, 1999), p. 109.

In his book 'The Myth of Independence' written as far back as in 1969, he has stated "All wars of our age have become total wars and it will be assumed that a war waged against Pakistan is capable of becoming a total war. It would be dangerous to plan for less and our plans should therefore include the nuclear deterrent".²

In January 1972, Bhutto convened a secret meeting in Multan of Pakistan's top scientists, engineers, military officers and bureaucrats. The scientists included Dr. Abdur Salam, Dr. I. H. Usmani and Dr. Munir Ahmad Khan. It was at the meeting that Bhutto announced his decision to manufacture the bomb within three years. Dr. M.A. Khan as head of the Pakistan Atomic Energy Commission replaced Dr. Usmani who was opposed to the idea of the bomb.

Pakistan's only nuclear power reactor KANNUP (Karachi Nuclear Power Plant) which Pakistan had built with the help of Canada went critical in 1971 and was inaugurated by Bhutto in November 1972. It began working at the desired capacity of 125 MW from July 1973.

Before proceeding to the progress of Pakistan's nuclear programme, the logic of taking the path to nuclearisation bears examination. Four distinct factors stand out and it will be seen that Pakistan's nuclear programme, unlike that of India, was conceived right from its inception as a weapons oriented one. The factors that drove Pakistan's weapons programme in the 70s are listed below.

- ➔ Pakistan's defeat in the 1971 Indo-Pakistan war.
- ➔ India's PNE (Peace Nuclear Explosion) in 1974.

2. D.K. Palit and P.K.S. Namboodari, Pakistan's Islamic Bomb, (New Delhi: Vikas, 1979), p. 15.

- ➔ Pakistan's overriding ambition to be the leader of the Islamic world.
- ➔ The distorted view that nuclearisation will neutralize the imbalance in conventional superiority vis-à-vis India.

Pakistan now embarked with two tracks in its nuclear programme. The first one was to set up eight 600 MW power stations in 20 years. The second was to be independent for nuclear material, both uranium and plutonium in the manufacture of which, material would be diverted for the bomb. The first programme was under Dr. Munir Khan, head of the PAEE (Pakistan Atomic Energy Establishment) and the latter, the bomb route under Dr. A.Q. Khan.³

But as is very clear, Pakistan just did not have the infrastructure to produce enough fissile material for a nuclear bomb. Nor did other technological infrastructure permit Pakistan to produce the bomb indigenously. This was the position in which Pakistan was at the beginning of its clandestine effort to produce the bomb.

Pakistan's Clandestine Bomb Programme:

The two paths adopted by Pakistan in its clandestine bomb programme in 1972 are aptly summed up by Dr. Savita Pande "Two trends can be detected since 1972 in the nuclear activities of Pakistan. One is towards re-processing (1972-1978) and the other is away from re-processing from 1978 onwards. After 1978 reproce-

It was kept latest as a form of insurance. Enrichment became the primary route after 1978, while from 1975-1978 both reprocessing and enrichment paths were active.⁴

3. Raja Menon, *A Nuclear Strategy for India*, (New Delhi: Sage 2000), p. 90.

4. Savitha Pande, 'Pakistan's Nuclear Strategy', *Asian Strategic Review*, 1993-1994.

The Plutonium Route:

Initially Bhutto intended to pursue the nuclear weapons programme by acquiring a large reprocessing plant from France for extracting plutonium from spent power reactor fuel. Pakistan had no apparent need for this material in its civilian nuclear programme. In 1976, there was a major tussle between US and France, with France wanting to sell its reprocessing plant without IAEA safeguards to Pakistan. US Secretary of State Dr. Henry Kissinger was dispatched to Pakistan and France and under US pressure France aborted the deal, thus frustrating Pakistan's efforts to go the plutonium route.⁵ In September 1977 US cut off economic and military aid to Pakistan. Bhutto himself had acknowledged the actual purpose behind the French deal in his written testament shortly before his execution.

The Enrichment Route:

Reprocessing was not the only route Pakistan was pursuing in its nuclear weapons programme. Pakistan planned for a uranium enrichment plant using ultra high speed centrifuges, as enriched uranium was the alternative to plutonium, which Pakistan was frustrated in their efforts to produce. A secret project named "Project 706" was set up under direct supervision of Bhutto. The plan was to set up a massive industrial unit at Kahuta. Project 706 aimed at acquiring the necessary supplies and equipment facility at Kahuta. The key figure in organizing this venture was Dr. A.Q. Khan, known widely as the father of the Pakistan bomb. A.Q. Khan who worked at a certified centrifuge enrichment plant at Almelo, Netherlands gained access and copied the all important list of private suppliers of crucial

5. Leonard S Spector, 'The Undeclared Bomb' (Cambridge: Ballinger, 1988), p. 121.

components for building a gas centrifuge plant and brought it back to Pakistan in 1975.⁶

Pakistan's clandestine weapons programme thus got its start with A.Q. Khan stealing secrets from abroad. The next step was to obtain hardware for the Kahuta plant. This was done by obtaining these from a number of western nations, often violating export control norms and even resorting to smuggling. The effort involved use of dummy corporations and transshipments through their countries. Some of these instances which have been documented are listed below:

- ➔ An entire plant for converting uranium powder into uranium hexafluoride, the easily gasified material that is the feedstock for the Kahuta enrichment facility was smuggled into Pakistan from West Germany between 1977 and 1980. In March 1985 a West German court convicted Albrecht Migule for the deed.⁷
- ➔ In June 1984 three Pakistan nationals were indicted for attempting to smuggle 50 cryotrons high-speed electronic switches used in nuclear weapons, out of the United States. Two of the three were released after turning state's evidence and the third Nazir Vaid, ultimately pleaded guilty to a lesser charge, serving three months in a US jail before being deported to Pakistan. Telegrams taken from defendants at the time of arrest revealed that the parts had been ordered by S.A. Butt, Director of Supply and Procurement, Pakistan Atomic Energy Commission.

6. Bidwai and Vanaik, *ibid.* p. 110.

7. Leonard S. Spector, *Ibid.*, p. 125.

→ Ashad Pervez, a Pakistani born Canadian was arrested in Philadelphia on July 11, 1987 for attempting to export illegally to Pakistan 25 tons of 'maraging' steel, an especially strong form of metal used in uranium enrichment centrifuges and beryllium used in nuclear weapons to increase their yield. On December 17,

1987 Ashad Pervez was found guilty and convicted in Philadelphia. Dr. A.Q. Khan himself was convicted for a four-year term in Holland in November 1983 for espionage but the charges were dropped in 1990. Some of the unconfirmed clandestine acquisitions are briefly listed below:

- 6500 tubes of hard steel used in the gas centrifuge system from Van Doorne Transmissie of Tilburg, Holland between 1976-1979.
- 100 metric tons of 'yellow cake' from Libya acting as a front, which purchased from Niger and re-exported it to Pakistan in 1979.
- Heavy water from Nukeismi's Swiss Subsidiary Internuclear in 1988.
- Nuclear plant accessories and reprocessed fuel from the Turkish firm, Ankara.

Though the above reports, is not considered hard evidence, it is quite obvious that the hardware and fissile material required for the bomb was neither available in Pakistan nor did Pakistan have the infrastructure to develop it. Import of the above materials was violation of international law. Suffice to conclude that Pakistan's nuclear weapons programme was pursued and achieved by illegal and often clandestine means.

Certain events during this period brought into sharp focus the tremendous progress that Pakistan was making in its nuclear weapon programme and that it

had the capability and was one step away from actual weaponisation in 1987 is now accepted as fact. These events are listed below:

- ➔ Announcement by Dr. A.Q. Khan in 1984 that Pakistan had been successful in the uranium enrichment endeavour.
- ➔ Statement by Gen. Zia-Ul-Haq on 01 March 1985 to the magazine *Christian Science Monitor* that Pakistan had enriched uranium upto 5%.
- ➔ Dr. A.Q. Khan's controversial interview to Indian journalist Kuldip Nayar in 1987 when he publicly declared that Pakistan had the bomb. The interview had been facilitated by Mushahid Hussain, then editor of 'Muslim', a Pakistani newspaper. In the interview, Dr. Khan had made a statement that Pakistan had the nuclear weapon and would use it to counter Indian aggression. Dr. Khan subsequently denied this interview but both, the Indian and Pakistan journalists stood by it.⁸

According to Rear Admiral Raja Menon, "The end of 1987 is considered a watershed in the nuclearisation of South Asia because from this point onwards India accepted that Pakistan had the bomb".⁹

Pakistan's built up of Infrastructure:

The build up of Pakistan's nuclear installations and infrastructure that facilitated the making of the bomb has continued unabated even after nuclear explosions by Pakistan in May 1998. The build up of its installations and infrastructure is linked with the incidents quoted above. Part of the build up of

8. K. Subrahmanyam. 'Indian Nuclear Policy', 'Nuclear India', ed. Jasjit Singh, p. 42.

9. Raja Menon. *Ibid.*, p. 99.

infrastructure as was the case with progress in bomb making was also done by clandestine means. A chronological narration of the build up of its technological infrastructure that was part and parcel of its nuclear weapons programme is given below. It is to be noted, at times, Pakistan had two or more projects going simultaneously.

The start point was in 1959 when the Pakistan Atomic Energy Commission decided on acquisition of a research reactor, which would go critical by 1959. Due to bureaucratic delays the US supplied 5 MW research reactor was finally set up at Pakistan Institute of Science and Technology (PINSTECH) in 1963, six years behind schedule.¹⁰

In the meanwhile DAEC, in 1962, entered into negotiations with Canada for the acquisitions of a CANDU type nuclear power plant and concluded an agreement in 1965. The Karachi Nuclear Power Plant (KANNUP), covered by trilateral safeguards went critical in 1971 and was formally inaugurated in 1972. A laboratory, scale-processing plant known as 'hot cell' was set up at PINSTECH for training of nuclear technicians and for experiments in plutonium chemistry. According to Leonard. S. Spector the plant became functional in 1971.¹¹

Pakistan's efforts to achieve nuclear fuel cycle autonomy that is essential for developing a nuclear weapons option commenced in the early 70s and gained momentum after India's nuclear implosion in 1974. Work began on a 'fuel fabrication' plant at Chashma in 1974. In 1976, the Canadians withdrew from this

10. Naveen Ahmed Salik, 'Pakistan's Nuclear Programme', 'Nuclear Non Proliferation in India and Pakistan' (New Delhi : Monohar, 1996), p. 87.

11. David Fisher. 'Stopping the Speed of Nuclear Weapons – The Past & the Prospects', (Routledge, London, 1993), p. 95.

agreement. Work continued on the plant and by illegal acquisitions which have been described earlier in this chapter, the plant had started supplying its indigenously fabricated fuel for KANNUP by 1981.¹²

The most vital and controversial of the Pakistani nuclear programme is the Ultracentrifuge Enrichment Plant at Kahuta. The cancellation of the French deal due to US pressure has already been explained. The pilot enrichment plant was constructed at Sihala, near the proposed site of the main enrichment plant. This facility became operational in 1979. The Kahuta enrichment plant had also started clandestine uranium enrichment in 1986. Between 1977 and 1980 Pakistan had acquired a 'gasification' plant and a solidification plant illegally from Germany and Switzerland respectively.¹³ The gasification plant is required to convert solid uranium into gaseous form for induction into the centrifuges and the solidification plant is required to convert the enriched uranium from gaseous to solid form for its eventual conversion to metallic nuclear cores.

Pakistan achieved a major breakthrough in nuclear reactor design technology in 1991 when they indigenously redesigned and upgraded PAAR – 1 (Pakistan Atomic Research Reactor – 1) from 5 MW to 10 MW. The achievement indicated the level of technical expertise and experience of Pakistani nuclear scientists and technicians. By December 1988, Pakistan had attained the capability to produce enough highly enriched uranium for two to three weapons annually.

Reports in the international press in 1985 that Pakistan had successfully tested non-nuclear triggering package for a nuclear weapon were corroborated by a

12. David Fisher. *Ibid.* p. 96.

13. Naveen Ahmed Salik. *Ibid.* p. 91

'Special National Intelligence Estimate' released in 1996. Pakistan's second commercial nuclear power plant is the Chashma Nuclear Power Plant (CHASNUPP). It is a 31 billion rupee Chinese aided project and the culmination of a contract signed on 31 December 1991. The plant went critical on 03 May 2000. This light water reactor is designed to generate 300 MW of electricity using 12 tons of enriched uranium annually. IAEA safeguards cover this plant. While there has been some transparency at this plant due to the safeguards, the 40 MW reactors constructed at Joharabad in Khushab district of Punjab remains shrouded in secrecy. The difference between CHASNUPP and KHUSHAB is that while the former is meant for production of electricity, the latter is suspected to be meant to produce weapons grade plutonium to make miniaturized nuclear warheads for being fitted in to the missiles clandestinely procured by Pakistan from China and North Korea.

Aid from Islamic Countries:

Pakistan had close ties to the oil producing Arab states and benefited economically in its quest for a nuclear weapons. Libya is believed to have agreed to finance Pakistan's nuclear programme in 1973. From 1973 to 1976, Pakistan received grants and loans worth nearly \$ 1 billion. From 1980 to 1993, assistance amounting to \$ 1222.5 million was received from Iran, Libya, Abu Dhabi, Qatar and Organization of Petroleum Exporting Countries. In 1981 Kuwait gave aid worth \$ 130 million and the Islamic bank \$ 19.4 million. In 1982 Pakistan received a loan of \$ 500 million from Saudi Arabia. Military assistance from the Islamic nations in 1983 amounted to \$ 1000 million. The Islamic countries were generous

in their offers of aid to Pakistan. This, an addition to the China and US factor discussed next, assisted Pakistan on its quest for the nuclear bomb.¹⁴

The China Factor:

After the 1974 nuclear explosion by India, the Chinese pledged support to Pakistan against nuclear threat and nuclear blackmail. The alleged deal between Pakistan and China in 1976 in which China had assured wide ranging help in the development of Pakistan's nuclear weapons programmes stands to logic in view of further developments.

The Chinese accelerated their support to Pakistan's nuclear programme in the early 80s. Yakub Khan's presence at a nuclear test in neither Lap nor, US Intelligence report of the transfer of a complete bomb design and enough uranium for two implosion devices was all indicators of Chinese active involvement. On 16 November 1989, Chinese Premier Li Peng during a visit to Islamabad announced that China would sell a 300 MW nuclear power reactor under a nuclear co-operation agreement signed by the two countries. The contract for the nuclear power plant was finally signed on December 31 1991 in Beijing. In mid 1985, the Indian Army Chief corroborated the US Intelligence report that China was about to conduct a nuclear test on behalf of Pakistan. The international press however reported in 1985 that China had already tested the Pakistan bomb.¹⁵ The Chinese sale of 5000 ring magnets to the A.Q. Khan Research Laboratory in Kakula in 1995 also helped Pakistan in their nuclear weapons programme. The Defence

14. Sumita Kumar. 'Pakistan's Nuclear Weapons Programme', Nuclear India (New Delhi, Knowledge World 1998), p. 160.

15. Leonard Spector. 'Nuclear Ambitions', (Boulder: Westview Press, 1990), p. 93.

Intelligence Agency of USA reported that the firm which sold the ring magnets to Pakistan was under the direct control of the State Council, which chaired by Chinese Premier Li Peng and constitutes the nation's top policymaking group.¹⁶

On the delivery systems front, Pakistan received the nuclear capable 300 km. range M-11 missiles from China including key components for the system. In August 1993 the US imposed sanctions on Pakistan's space agency and on China's Ministry of Aerospace Industries because of the sale of missiles with a range of 600 km. and inherently carrying a 500 kg. Payload. The recently inducted Pakistani Ghauri missile, which triggered off India's Pokhran II explosion is believed to be a derivative of either the Chinese Dong-Feng 25 (1700 km. range) or the North Korean Nodong-2 (1500-2000 km. range).

While there is no doubt whatsoever that the Chinese assisted Pakistan considerably in their nuclear weapons programme, their assistance could be summed up as under:

- ➔ Chinese assistance was more important in the seventies and early eighties.
- ➔ Chinese made major contributions both at the level of information and at the level of supply of spare parts, equipment, technology and trained manpower.
- ➔ Such assistance as given was significant but not decisive in Pakistan's quest. At best it accelerated the pace at which Pakistan reached its goal.

US Role in Pakistan's Nuclear Programme:

The US role in Pakistan's nuclear weapons programme has been a dubious one. The US faced a dilemma on its commitment to non-proliferation on one

16. Sumita Kumar, Ibid. p. 165.

hand and its desire to keep Pakistan as a frontline state due to Soviet invasion of Afghanistan in 1979, on the other. This dilemma prompted the US administration to ignore 'inconvenient realities' such as missile and nuclear technology acquisition by Pakistan. The events narrated below bring out starkly, the importance of the US administration to slow down or terminate Pakistan's clandestine nuclear weapons programme in spite of clear evidence presented by US intelligence agencies itself.

In May 1979, Washington made public its concern over Pakistan's perusal of its enrichment programme and terminated aid for the second time. Assistant Secretary of State Thomas Pickering declared in a Congressional testimony that Pakistan's enrichment programme was not justified by its nuclear energy needs. He added "we are concerned therefore that the Pakistani programme is not peaceful but related to an effort to develop a nuclear explosive capability".¹⁷ on 25 December 1979 barely six months after reimposition of sanctions by the US, the Soviet occupation of Afghanistan commenced. This incident had dramatic consequences for Pakistan. US immediately reversed course and offered both economic and military aid to Pakistan. This trend continued right till 1990 when the Soviets withdrew from Afghanistan.

A six-year \$ 3.2 billion aid was granted in 1981. It was a six-year exemption from a US non-proliferation law known as the Symington Amendment. This law had previously prohibited such assistance to Pakistan because of Pakistan importing enrichment equipment.

17. Leonard Spector. 'The Undeclared Bomb', (Cambridge: Ballinger, 1998), p. 125.

Pakistan's efforts towards its nuclear weapons programme never wavered. In spite of all earlier evidence, the Reagan Administration in 1985 approved a second instalment of \$ 3.2 billion and package, which had commenced in 1981. At this time the Pressler Amendment was enacted to tighten US proliferation laws. This law stipulated that the US President must certify each year that Pakistan does not possess a nuclear device before aid could be distributed. The US Congress also enacted the 'Solarz Amendment' at the same time. This law prohibited aid to any non-nuclear state found to have smuggled items from the United States for use in an explosive device. Both these laws were broken, both in letter and spirit as will be clear as the narrative unfolds.

1985 was a landmark year in US-Pakistan equation as regards its nuclear weapons programme. In 1984, US President Reagan had warned Pakistan in a letter addressed to Zia-Ul-Haq not to enrich uranium beyond 5%.¹⁸ In September/October 1985, Pakistan went ahead in the enrichment beyond the laid down 5%. The Reagan Administration was aware of this fact. US President did not bring up the topic with Pakistan President when they met at the UN. The issue was deliberately avoided by the US to avoid a rift with Pakistan, a key ally in US efforts against Afghanistan.

Thus US at the highest political level had decided to acquiesce in Pakistan's decision to move towards the production of weapon grade uranium, the final step in its development of a defacto nuclear weapons capability.

In March 1986, The Reagan Administration announced that it would provide Pakistan a second six year aid package amounting \$ 4.02 billion, which would

18. Leonard S. Spector. Ibid. p. 129.

begin in October 1987. From this point onward, there was no doubt in Pakistan that the US was aware of its clandestine pursuit of nuclear weapons but would turn a blind eye.

A number of other reports, too numerous to be listed in this study gave credibility to statements that Pakistan had produced weapon grade material in 1986 and had also conducted two additional tests on non-nuclear portions of the device also in 1986. US aid, however, remained unaffected and on October 27 1986, President Reagan certified that Pakistan did not 'possess' a nuclear device.¹⁹ This certificate was necessary under the Pressler Amendment cited earlier, without which further aid to Pakistan could not be disbursed. President Reagan again certified Pakistan's non-possession in December 1987 and in January 1988 waived the 'Solarz Amendment', which prohibited aid to any non-nuclear State found smuggling items from US for use in an explosive device. Thus as mentioned earlier, both the Pressler and Solarz amendments aimed at strengthening US proliferation laws were broken in letter and spirit to accommodate Pakistan. By the end of 1987 it was clear to the world community that Pakistan had the bomb. Soon after the Soviet troops withdrew

From Afghanistan in 1989, Pakistan's strategic relevance to the US was reduced and the US government decided in 1990 to suspend economic and military aid to Pakistan. The US President refused to certify that Pakistan did not possess a nuclear device and brought into force the Pressler amendment to suspend aid.

From bomb in the basement to nuclearisation:

In 1991, India and Pakistan entered into an agreement prohibiting attacks on each others' nuclear installations. In 1992, Pakistan's Foreign Secretary publicly

19. Leonard S. Spector. *Ibid.*, p. 142.

discussed Pakistan's possession of 'cores' of nuclear devices. In December 1992 Senator Larry Pressler stated in a press interview that Pakistan had assembled seven weapons and could air drop one in a matter of hours.²⁰ In 1994, US commenced its efforts to cap reduce and eliminate nuclear weapons in South Asia. Deputy Secretary of State Strobe Talbott visited Pakistan as part of this effort.

In January 1992, India and Pakistan exchanged lists of atomic installations, which each side pledged not to attack as part of confidence building measures. In 1996 Pakistan commissioned an unsafeguarded nuclear reactor details of which have been given earlier in this chapter. The purchase of the controversial 'ring magnets' from China for the Kahuta plant confirmed Pakistan's intention in accumulating enriched uranium for use in nuclear weapons.

In July 1997 Pakistan confirmed its test firing of the new indigenous Hatf missile. In September 1997 Pakistan Prime Minister Nawaz Sharif confirmed Pakistan's nuclear capability. On 06 April 1998, Pakistan successfully test fired its medium range ballistic missile Ghauri. India responded by carrying out its nuclear tests between 11th and 13th May in the same year. Pakistan brought its bombs out of the basement and went nuclear by detonating five nuclear devices on 28 May 1998 and one device on 30 May 1998, lying to rest once and for all speculation regarding its nuclear status.

It may be pointed out that Pakistan's Foreign Minister Assef Ahmad Ali, on a recent visit to Uzbekistan expatiated his country's declarator country's policy

20. Dec. 01, 1992. NBC News Broadcast.

underpinning its nuclear strategy. At a news conference, on 8 Jan 1994, *he warned that nuclear war might engulf South Asia if his country's territorial dispute with India went unresolved* – “Unless the Kashmir dispute is solved peacefully on terms of international law and UN resolutions, there cannot be lasting peace in South Asia and there is always danger of a fourth war in the region ... And this time around, the concern of the world, the concern of regional countries is that if a war takes place in South Asia it might become a nuclear war ... *It is very important for all countries in the region to recognise the immense danger to the world of a war in South Asia which could become the first nuclear war in the history of this part of the world*”.

The declaration by Assef Ahmad Ali, unlike past disclosures made by Pakistan's nuclear fraternity diplomats or United States intelligence sources, is a direct and authentically articulated threat to the security of South Asia in general and India in particular. The Government of India and a number of intellectuals have readily accepted the subsequent disclaimer by the Pakistan Government, that the Minister had been misquoted by the press. This low-key reaction may be justified in normal diplomatic terms. But what needs to be grasped is that nuclear diplomacy has its own dynamics and is a totally different kettle of fish. Statements at press conferences in today's world are recorded. It is difficult to believe that all members of the Press would uniformly file an incorrect report. The ploy of making a public statement and following it up by a retraction is not new. But when we analyse the intricacies of declaratory statements in support of nuclear policy, it takes on a sinister hue.

Pakistan is a unique situation where its expansionist strategy to wrest Kashmir from India is being effectively stymied by India. The causes of frustration are:

- Pakistani sponsored insurgency in Kashmir is taking an unprecedented whipping at the hands of the Indian Army. The inability of Pakistani forces to bail out the militants has adversely affected their credibility, which in turn has loosened their hold on the dissidents in Kashmir.
- Pakistan has been hovering on the brink of being declared a terrorist state by the United States under threat of international sanctions. The Government is showing signs of desperation to achieve their goals in Kashmir before the curtain comes down.
- The stability of the newly elected PPP Government is threatened by internal dissension brought about by internecine contradictions in the Bhutto family and the Party's precarious dependence on its coalition partners. This forecloses Bhutto's options to negotiate with India on Kashmir.
- With the materialisation of the pre-Independence bloc in Pakistan Occupied Kashmir, Benazir Bhutto's Government is being forced to take a virulent stand on Kashmir to demonstrate its bona fides in domestic policies. This leaves little, if any, room to develop a realistic policy that would ameliorate tensions in the subcontinent.
- The insufficiency of conventional military means to force a decision in Kashmir has, to a large degree, been responsible for Pakistan's compulsions to go nuclear.

These issues and the articulated threat cannot be wished away, ignored or procrastinated over. Such a reaction communicates a lack of political will and inability to appreciate and formulate National Strategy to defend India's vital

National Interests leaving her open to diplomatic coercion and physical destruction. Therefore, it is imperative that the Indian Government makes an immediate and appropriate response.

The Indian leadership cannot but take cognisance of these statements for the following reasons:

- ❑ The statement was made by the Foreign Minister and, therefore, constitutes a part of Pakistan's foreign policy;
- ❑ It was delivered at a press conference in a foreign country, a pronouncement that cannot be made by such a high-ranking personality unless cleared by Government;
- ❑ It was made at a time when the Pakistan lobby in the United States was making serious attempts to have the Pressler Amendment modified to re-open military and economic aid to the ailing economy;
- ❑ It was made immediately after the Seventh round of Foreign Secretary level talks recently concluded in Islamabad (1 – 3 January) following a gap of 17 months where all issues including nuclear non-proliferation were reportedly part of the agenda;
- ❑ It was made as a part of the concerted drive by Pakistan to internationalise the Kashmir issue to draw the United States into the controversy to overcome to military disadvantageous equation on the subcontinent;
- ❑ Comes at a time when the United States has been making a number of anti-Indian pronouncements and initiatives to inveigle their way into the negotiation process on J & K.

- The prime motivation of the statement flows from policies initiated by Prime Minister Qureshi, on the collapse of Nawaz Sharif Government, directed towards highlighting South Asian security concerns overtly to sensitise international opinion.
- Pakistan has deliberately developed nuclear weapons as an equaliser to offset its inferiority in conventional military power. She can be expected to initiate a pre-emptive nuclear strike in the event an Indian offensive threatens defeat.

Analysis of Factors

International perceptions notwithstanding, India cannot and will not predicate its nuclear strategy on the use of nuclear weapons to attain its objectives. Initiation of a nuclear exchange is a self-defeating stratagem, which would destroy the socio-economic fabric of the nation state with no scope of achieving the desired political objective. A pre-emptive first strike is indicative of an inability to formulate and put into place a practicable nuclear strategy and infrastructural bankruptcy. Whatever else, Indian policy-makers would create a weapons capability of contingent to having responsible, comprehensive and responsive infrastructure in place, which would make the Government accountable to its own people and collateral communities.

To date India has forsworn the right to exercise the nuclear option thus bringing about a dangerous nuclear asymmetry that could invite a pre-emptive strike by an irresponsible belligerent, such as Pakistan. A country that has based its very existence on an anti-Indian stand and directed its foreign policy accordingly.

Pakistan's nuclear capability and strategy have been cautiously unveiled in a graduated manner to that global perceptions were contained at levels that would not precipitate political and economic fallout to unmanageable dimensions and would full India into a state of vulnerable complacency. Have we now reached that stage where Pakistan feels confident in its nuclear capabilities to express its intent as categorically as has been done by the Foreign Minister? What must the Indian Government do to safeguard its national security? The moral high ground is no protection against nuclear coercion. Lofty ideals or cerebral inertia, whichever is responsible for the dangerously asymmetric nuclear equation in South Asia, must give way to formulation of pragmatic national security strategy corresponding to ground realities.

The present Government of Pakistan is, to an extent, dependent on the indulgence of the military. It is not clear who controls the nuclear arsenal. Is it with the military through General Arif (Retd.) with the political leadership cut out of the loop? If so, it needs to be noted that the General wields extraordinary influence with the higher echelons of the Pakistani Army.

The Pakistani-initiated low intensity conflict in Kashmir has stalled with the militant cadres presently on the defensive, military materials running low and prospects of further reverses predicted in the next three to four months, Pakistan is endeavouring to:

- Stem the collapse of the militant structures created in the Valley.
- Buy time to put into place materials and men to rejuvenate their strategy in the Valley.

- Upgrade the low level insurgency into a full-fledged guerrilla war in J & K. The need to buy time and circumscribe India's anti-militant operations has given impetus to diplomatic initiatives to compel the international community to intervene in Kashmir and reduce the pressure on the militants.

Blatantly specious efforts at linking Pakistan's aspirations to Kashmir with their nuclear strategy are aimed at heightening international security perceptions sufficiently to draw the United States into intervening in Indo-Pak relations.

Their protestations notwithstanding, the United States has a number of prime strategic interests in the Subcontinent.

- The need for a suitable host country along the Southern flank of the Central Asian Republics to provide surveillance and military facilities to safeguard their interests in that explosive region. An independent and beholden Kashmir would fit the bill.
- Creation of a viable and totally dependent State in the region for future initiatives to meet long-term objectives designed to destabilise China through Tibet and institute of defensive measures against resurgent, recalcitrant Russia.
- Pressure India to conform with the United State's national interests to ensure non-proliferation of nuclear weapons and their delivery means;
- Disallow the emergence of another power centre (India), which would place a greater strain on an already hard, pressed United States to maintain its pre-eminence in global power equations – even if it means the Balkanisation of India. The administration's attempts to modify the Pressler Amendment

would allow the President to sanction, aid to Pakistan, even if it is in violation, of specific United States laws, if it is considered in the American security interests. It would be an interesting exercise to analyse United States security imperatives in the Kashmir region.

Pakistan would like India to believe that if the restraints being exercised by the latter in Kashmir were replaced by a more aggressive policy, the escalation could result in more direct military confrontation with serious repercussions on Pakistan. As the latter's capabilities are unequal to the task of wresting Kashmir from India, the ensuing frustrations could lead to miscalculations that provide the basis for launching a pre-emptive nuclear strike against India. The likelihood of such an occurrence is expected to furnish grounds for pre-emptive intervention by external powers such as the United States.

India needs to communicate to Pakistan that:

- If India were to actuate its nuclear option, it has the wherewithal to create an endurable weapon is capability to respond to a pre-emptive nuclear-strike by Pakistan. This would provide the necessary disincentive to any form of nuclear opportunism.
- A nuclear retaliation by India on a geographically small and economically impoverished Pakistan could comprehensively destroy the socio-economic structure of that country.
- On the other hand, with Pakistan's limited capabilities, while it could deliver a crippling blow through a pre-emptive nuclear strike, India has the geographic, economic, technological, industrial and structural endurance to survive and reconstruct itself.

India's Response:

To ensure regional stability and reduce the scope for extraneous grounds for escalating the situation to nuclear exchanges, Indian diplomacy must be directed towards avoiding an outbreak of conventional war on in subcontinent – and neutralising the linkage of nuclearisation of the region with Kashmir issue to offset western mind-sets.

However, any choice that India may have had vis-à-vis their nuclear policies have now been foreclosed effectively. The government must, first and foremost, take firm measures to put into place a credible deterrent to forestall the eventuality of Pakistan taking the opportunity to initiate a nuclear strike as a *fait accompli* or risk being destroyed without a whimper. Sufficient justification has been provided without India deferring to the opinion of other global entities.

Failure of the United States to dissuade Pakistan from its nuclear aspirations is a consequence of the former's political shenanigans in the closing stages of the Cold War. Emerging United States national interests notwithstanding, India cannot jeopardise its own integrity and sovereignty in obeisance to such geo-strategic convolutions.

This decision must be unambiguously communicated to Pakistan. The latter must be provided enough evidence that:

- Has the capability to respond with devastation to any pre-emptive nuclear strike, so as to destroy the socio-economic structure of Pakistan;
- Has the political will supported by viable nuclear strategy and infrastructure to safeguard its socio-economic well being and survival;

- Has clearly defined national interests on which no compromise will be made;
- Is determined to deal with Pakistan on a bilateral basis only and will not be rail roaded into multilateral negotiations on its territorial integrity, leave alone the Kashmir issue;
- Has no intentions to initiate a nuclear exchange and that the underpinning strategy is predicated solely on retaliation;
- And is willing to keep open clear lines of communication for mature management of the changed strategic configuration of the region.

At the same time the Indian Government should communicate this decision to all other states providing them the rationale for its nuclear policy. Thereafter, India would be best advised to provide verifiable guarantees that it would continue to adhere to the concept of the NPT in so much that it would:

- Not transfer nuclear weapons or related technology and materials to any other country, be it a NWS or NNWS;
- Not clandestinely import nuclear related technologies from other countries;
- Conform to globally institutionalised treaties on nuclear testing;
- Through open nuclear facilities, not associated with its security imperatives, to international safeguards;
- And forswear vertical nuclear proliferation or a regional nuclear arms race by restricting the nuclear strategy to one of the minimum deterrence with finite limitations on capability.

Finally, India should re-initiate its proposal to the United Nations for universal nuclear disarmament.

Conclusion:

International relations in the contemporary world are experiencing divergent pulls and pressures depending on the global or regional magnitude of the payers' aspirations. The United States has imperatives aimed at retaining its global pre-eminence in the political, economic and military spheres. Pakistan's imperatives are limited to regional goals aimed at acquisition of Kashmir, attaining an equitable power balance vis-à-vis India and, becoming the predominant party in the Islamic configuration in the Middle East. Both global and regional issues play a major role in the development of China's foreign policy. China's internal anxieties in Sinkiang and Tibet demand a secure flank along its South Western extremities while it is occupied by its aspirations to great power status in global politics.

Indian policy-makers must accept these complexities and their convergence on India's security environment. Each of these states has their own compulsions in the Kashmir issue and nuclear proliferation in South Asia. The United States, having accomplished the dismemberment of the erstwhile USSR now faces several challenges to its position as the remaining super power. Loss of that status will reduce its capacity to control global events in keeping with its interests. One major threat emanates from China. Do the United States plans include dismantling the Chinese power quotient? If so, do they covet an Independent Kashmir, dependent on American largesse, which would give them access to the vulnerable underbelly of China? Is that the reason that China has taken the stand that an independent Kashmir is not acceptable?

Is there a nuclear threat to India and if so, who is it from? How does nuclear proliferation correlate to the Kashmir question? Pakistan requires American intervention to assist it in its aspirations on Kashmir. The Americans are particularly concerned with the proliferation of weapons of mass destruction and their delivery means in South Asia. Is Pakistan forcing the issue by creating a connection between Kashmir and the 'bomb'?

The bottom line is that Pakistan has finally articulated a direct and unambiguous threat of nuclear war and cited India as the correspondent. It is a significant benchmark in the ongoing Indo-Pak animosity, which necessarily extends itself beyond the immediate region. India cannot ignore this and must take appropriate measures to make its position clear to the world at large and a specific response to Pakistan. Whether this is done in one package or through confidential and limited rejoinders to different players is a matter of detail that the Indian Government must decide. Finally, the Government must crystallise its nuclear policy and create the necessary infrastructure that would give the country the necessary deterrent and the armed forces the wherewithal to survive in combat in a nuclear environment.

India and CTBT

Since independence, pursuit of nuclear disarmament has been an important objective of India's foreign policy. India believes that the existence of nuclear weapons poses a threat to international peace and security. Creating a nuclear weapon free world by eliminating all nuclear weapons through a multilaterally negotiated treaty, which is effective and verifiable, will enhance global security and the security of every man, women and child.

In pursuit of nuclear disarmament, India has taken many initiatives. India was among the first countries to call for a ban on nuclear weapon testing, as early as 1954. Such a ban would have prevented the nuclear arms race, which the world has witnessed in recent decades. During the period, the UN General Assembly adopted nearly hundred resolutions on this highlighting the concern of the world community on this issue.

India has always believed that such a treaty should be comprehensive and bring an end to the qualitative development of nuclear weapons. At the same time, a Comprehensive Test Ban Treaty should mark the first definitive and irreversible step in the process of nuclear disarmament. Therefore, a CTBT must reflect a commitment to achieving elimination of all nuclear weapons within a time bound framework.

During the negotiations on a CTBT in the Conference on Disarmament in Geneva, India participated actively and constructively, putting forward its

proposals, in keeping with its longstanding position. It is a matter of regret that the text, as has finally emerged, does not do justice to the negotiating mandate. It is not a comprehensive ban but merely a ban on nuclear explosive testing. It also lacks a definitive commitment to nuclear disarmament.

India remains committed to pursuing global, nuclear disarmament with a view to creating a nuclear weapons free world and a non-violent world order.

- Information on India's nuclear tests
- Statements made by I.K. Gujral, Minister of External Affairs, in the Indian Parliament on CTBT

July 15, 1996

July 31, 1996

August 2, 1996

August 26, 1996

September 11, 1996

- Nuclear Non-Proliferation – a note by the Embassy of India
- Statement by Sharad Pawar at the General Debate of the First Committee, United Nations General Assembly on October 14, New York.
- Statement by Ambassador Savitri Kunadi, Permanent Representative of India to UN in the plenary meeting of the Conference on Disarmament, Geneva on August 6, 1998.
- Statement by Ambassador Savitri Kunadi, Permanent Representative of India to UN in the plenary meeting of the Conference on Disarmament, Geneva on June 2, 1998.
- Negotiating the CTBT: India's Security Concerns and Nuclear Disarmament.

- ❑ Statement in explanation of vote by Ambassador Arundhati Ghose, Permanent Representative of India to the UN at Geneva, on Item 65: CTBT at the 50th Session of the UN General Assembly at New York on September 10, 1996.
- ❑ Statement by Ambassador Prakash Shah, Permanent Representative of India to UN on CTBT at the 50th Session of the UN General Assembly, New York on September 9, 1996.
- ❑ Statement of Arundhati Ghose, Ambassador of India to UN in the Plenary Meeting of the Conference on Disarmament, Geneva on August 20, 1996.
- ❑ Statement made by Ambassador Arundhati Ghose, Permanent Representative of India to the UN at Geneva in the Plenary of the Conference on Disarmament, on August 8, 1996.
- ❑ Statement made by Ambassador Arundhati Ghose, Permanent Representative of India to the UN at Geneva in the Plenary of the Conference on Disarmament, on June 20, 1996.

“India has never made a secret of its reservations over the CTBT’s contents and its overall thrust, not only at the Geneva Conference but at various other global fora during the last couple of years. India has made it clear that it was distancing itself from the CTBT in its present form. Within India, the decision to declare unacceptance of the CTBT has found overwhelmingly favourable response, cutting through party and political lines. Indeed, just as India’s refusal to sign the Nuclear Non-Proliferation Treaty (NPT) and its rejection of the move to give it a permanent tenure enjoyed national backing, the rejection of the CTBT

also enjoyed national consensus. It will be no exaggeration to say that on both the NPT and the CTBT, India as a nation, has displayed unanimity in endorsing and supporting the government's nuclear policy and decisions arising from it. This is not surprising, considering that, not unlike domestic policies which get caught in contention, and controversy stemming from different perceptions, among political parties, India's foreign policy, its nuclear policy and the national commitment to total, universal and immediate nuclear disarmament, have always enjoyed bipartisan support through the post-independent decades.

India's championship of the cause of nuclear disarmament is well known. For the last four decades, India has stood at the vanguard of the campaign against nuclear weapons and their use, and it has advanced numerous proposals and programmes for bringing about a nuclear-weapons-free and non-violent world into being. At the same time, it has remained consistently opposed to the objectives of the CTBT on the ground that its provisions do not address India's major concerns. If the NPT was one-sided, discriminatory, and favoured the nuclear weapon states, India thought that the CTBT was even more inadequate in safeguarding its security interests.

India's campaign against nuclear proliferation indeed started even before independence as part of the demand of its leaders for international cooperation to maintain world peace. The campaign received a stimulus after independence, with Jawaharlal Nehru launching a movement to mobilise world opinion in favour of ending the confrontation between the super-powers who were carving out their respective areas of influence in the post-Second World War period. The campaign intensified after the birth of the Non-aligned Movement, which gave top priority to the cause of nuclear disarmament and world peace.

Consistent with this ethos, there has always been a continuous debate within the country on the issue of total disarmament – both conventional and nuclear. The decision to reject the CTBT was preceded by an extensive national debate. It is not as if the objectives underlying the concept of a global ban on nuclear testing did not find favour within the country. On the contrary the reservations in respect of the CTBT were precisely on the ground that it did not contain a genuine commitment towards disarmament. And, while announcing its inability to sign the CTBT in the form in which it was drafted, India has presented a strong and credible case in support of its stand. It is noteworthy that the principle stand that was enunciated at Geneva Conference in 1996 has been the same one which succeeding governments have adopted in respect of a global nuclear policy and objective.

Addressing the Geneva Conference, India's Ambassador and Chief Delegate, Ms. Arundhati Ghose pointed out that India had put forward a number of proposals consistent with the mandate adopted by the Conference, aimed at ensuring that the CTBT must be a truly comprehensive one – that is, a Treaty which bans all nuclear testing without leaving any loopholes which would permit nuclear-weapon-states to continue refining and developing their nuclear arsenals of their test sites and in their laboratories. These proposals had underscored the importance of placing the CTBT in a disarmament framework, as part of a step-by-step process, aimed at achieving a complete elimination of all nuclear weapons within a time-bound framework.

The Ambassador then proceeded to point out how the negotiations had skirted around the principle, which India had enunciated. "At this late state", she said. "We are obliged to conclude that the basic prohibitions as drafted so far,

which define the scope, remain very narrow and do not fulfil the mandated requirement of a comprehensive ban. This approach would give us only a 'nuclear weapons test explosion ban treaty' and not a Comprehensive Test ban Treaty." Ms. Ghose said that the nuclear weapons states were determined to continue to rely on nuclear weapons for their security and visualise the CTBT not as a serious disarmament measure but merely as an instrument against horizontal proliferation. Nuclear weapons states seemed loath to relinquish their monopoly and regard nuclear weapons as integral to their military strategy.

"The CTBT that we see emerging, appears to be shaped more by the technological preferences of the nuclear weapon states rather than the imperatives of nuclear disarmament. This was not the CTBT that India envisaged in 1954. This cannot be the CTBT that India can expect to accept." Ms. Ghose said, adding, "We cannot accept that it is legitimate for some countries to rely on nuclear weapons for their security while denying this right to others. Our capability is demonstrated, but as a matter of policy, we exercise restraint. Countries around us continue their weapons programme, either openly or in a clandestine manner. In such an environment, India cannot accept any restraint on its capability if other countries remain unwilling to accept the obligation to eliminate their nuclear weapons."

The Ambassador reminded the delegates that India had not signed the NPT because that Treaty sought to legitimise the indefinite possession of nuclear weapons by the five countries (P – 5) – Britain, Russia, United States of America, France and China. "Today", she continued, "the right to continue development and refinement of their arsenals is being sought to be legitimised and is not in India's national security interest. India, therefore, cannot subscribe to it in its present

form.” India’s stand has been understood and appreciated by non-nuclear nations who are mostly in the developing and poor world. India’s stand is based on principles and not on political expediency, as it cannot ignore the threat to its security arising from nuclear cooperation and collusion between its neighbours.”

(S. Viswan, Associate Editor of “The Deccan Chronicle”, with thanks.).

Nuclear Related terms and Theories

India became the sixth state with nuclear weapons in May 1998. After the explosions, the Draft Report of the National Security Advisory Board was released with the intention of encouraging public debate. This document outlines the broad principles for the development, deployment and employment of India's nuclear forces. Since the next chapter focuses on India's emerging nuclear strategy, which would obviously be in synchronization with the nuclear doctrine, the two key factors of minimum credible deterrence and no first use along with other nuclear related terms are explained in this chapter.

The theory of deterrence, which is the basis of nuclear thought, which has evolved over two decades will be analysed first. While most nuclear philosophies and strategies have evolved in the west after the advent of the nuclear era, the nuclear related terms will be explained with particular reference to India and Pakistan in the South Asian setting. The nuclear related terms, which have been explained, are listed below:

- ➔ Massive Retaliation, MAD (Mutually Assured Destruction) and Flexible Response.
- ➔ Deterrence Theory.
- ➔ Deterrence by Punishment.
- ➔ Deterrence by Denial.
- ➔ Minimum Credible Deterrence & Recessed Deterrence.

- Counter value and Counter force targets.
- First and Second Strike.
- Nuclear Reaction Threshold.
- NCA and NCP (Nuclear Command Authority and National Command Post).
- Nuclear Triad.
- All Horizons.

Massive Retaliation, Mutually Assured Destruction and Flexible Response:

The above three terms are products of the Cold War era and the US-USSR changing nuclear equations of that era and have little relevance to the Indo-Pak-South Asia scenario. However since these are terms related to the evolution of nuclear strategy, it is essential to understand the terms in their correct perspective.

The term 'massive retaliation' came about from the US realization in the early 1950s that USSR must be deterred from any conventional adventurism in Europe. This was done by maintaining overwhelming nuclear superiority both, in the number of warheads and in the range, extent and spread of nuclear systems and by surrounding the USSR with airbases under NATO. The aim was to convey to the Soviets that if they threatened Europe, the US would have no option but to use nuclear weapons on the Russian heartland. The Soviets were disadvantaged because of the great imbalance that existed between the US and Russian nuclear arsenals upto the 1960s. Hence 'massive retaliation' was US nuclear policy against USSR at that time.

In 1960, the USSR developed the capacity to threaten the US mainland through land based ICBMs. It was only by the mid 60s that USSR had sufficient members to constitute and assured second strike capability. It then became clear to the US that 'massive retaliation' would not work because a response by the USSR would result in MAD (Mutually Assured Destruction), where at the end of nuclear war there would be no winners. This gave rise to the theory of flexible response.

Flexible response was the reaction to the changed nuclear equation. Flexible response meant that US nuclear response would be more measured and limited. In 1962, the Secretary of Defence Robert McNamara first proclaimed the 'no cities' doctrine, implying that US would not attack Soviet cities with nuclear weapons. Due to improvement in nuclear technology it became possible for the US to carry out precision strikes on Soviet missile launch centres. Therefore US expected, that since it would have attacked only military targets, USSR would respond accordingly. The US also attempted to be one up in every stage of gradual escalation and its response could be flexible as per the developing situation. This concept came to be known as the theory of flexible response and escalation dominance. The veracity of this theory was questioned by many experts and eventually strategic parity between USSR and US forced the US into the realm of arms control.

The theories have been listed to bring out the folly of excessive stockpiling of arms and to illustrate that large nuclear arsenals do not necessarily mean strategic stability. The shift from massive retaliation to mutually assured destruction to flexible response is a useful background to understand and to illustrate what

India's emerging nuclear posture is likely to be, which the focus of the next chapter is.

Deterrence Theory :

The concept of nuclear deterrence has dominated international strategic theory during the past two decades. According to Robert Jervis, deterrence theory is probably the most influential school of thought in the American study of international relations. Deterrence is simply the persuasion of one's opponent that the costs and/or risks of a given course of action he might take will outweigh its benefits.¹

It is not intended to carry out a detailed analysis of the deterrence theory, which is a subject of study, by itself only to bring out the broad parameters, to enable an understanding of other terms related to deterrence in the south Asian context.

The advent of the nuclear weapons changed the manner in which civilian analysts looked at military strategy. The first of the great perceptive strategists of the nuclear era was Bernard Brodie, who in 1946 published an article on nuclear strategy that was accepted and followed only 15 years later. One of the major predictions made by Bernard Brodie was that the only defence against the nuclear bomb would be the ability to retaliate in kind. Its only role would be to deter war.² this went totally against conventional strategy, which used weapons and

1. Frank C. Zagare. 'The Dynamics of Deterrence', Chicago & London, University of Chicago Press, 1987, p. 7.

2. Brodie. 'The Absolute Weapon, Atomic Power and World Order', New York, Harcourt Brace & Co., 1946.

munitions for termination of war. Upto the 60s, with an overwhelming superiority in nuclear weapons and delivery systems, the West was sure that nuclear weapons deterred a conventional arms aggression by the USSR in central Europe. The word 'deterrence' was therefore first used to mean deterring, with nuclear forces, a superior conventional force bent on aggression.

However, deterrence as is commonly understood today and is applicable in the South Asian context and as articulated in India's nuclear doctrine is the mutual stand off between two powers who have a latent or openly hostile relationship and who both possess nuclear weapons. In such a relationship deterrence is supposed to work at the nuclear level but no such claims are made at the low intensity conflict level. The Kargil episode that happened after both India and Pakistan has nuclearized is an apt example. K. Subrahmanyam, Chairman NSAB (National Security Advisory Board) has precisely summed up deterrence in the Indian context. "The core of deterrence especially for a country which commits itself to no first use is its ability to carry out punitive, unacceptable retaliation. This is not cold war language but to communicate to the nuclear warriors who believe in the use of nuclear weapons first. Unless one opts to allow his nation and society to be destroyed in a cold-blooded first strike by the adversary and not do anything to deter him, it is logical to make it clear to such nuclear adversaries, the consequences of his resorting to a first strike. The word unacceptable damage does not carry today the connotations of the MAD (Mutual Assured Destruction) era of Robert McNamara. Therefore those who believe in wielding nuclear weapons to intimidate other nations and in the first use of nuclear weapons have to be deterred by spelling out the consequences of their actions."³

3. K. Subrahmanyam. 'The Logic of Nuclear Deterrence', Times of India, Oct. 4, 1999.

Deterrence by Punishment:

Deterrence by punishment seeks to prevent aggression by threatening unacceptable damage in relation, by the threat of punishment. Though a western concept, this first view of deterrence by punishment as espoused by Bernard Brodie is what is alluded to in India's draft nuclear doctrine. India in the South Asian context is the status quo power Vis a Vis Pakistan, which is viewed as the revisionist power which wants to alter the status quo existing in Kashmir. The general theory holds that the status quo power has no desire to go to war, but in response to the revisionist power's aggression, which being nuclear, the status power is prepared to absorb and then inflict catastrophic punishment in reprisal or revenge. The notion by which use of nuclear weapons would be deterred has come to be called deterrence by punishment and has some logic since it has been accepted world wide actual use of military weapons cannot be harnessed to any meaningful military objective.

Deterrence by Denial :

The notion of deterrence by punishments was challenged by an opposing view that suggested nuclear deterrence could work only if nuclear weapons are mated with a strategy that seeks victory in such a war. The theory was applicable only in the context of USA, erstwhile USSR, but is of relevance depending upon the future course of nuclear weapon deployment in South Asia.

Briefly analysts assume that deterrence can fail and they insist on the need to prepare for that eventuality. The devastation of nuclear war makes deterrence the first choice but not an alternative to defence. Preparing for defence, even in the context of nuclear war makes sense because good defence reinforces deterrence

because it accounts for the possibility of deterrence failure.⁴ The logic of deterrence by denial, being the US capability to go through 'Nuclear war fighting' and emerge winner. Denial strategies assume importance in the South Asian context because of the Chinese factor. Rajesh Rajagopalan writing in Strategic Review states "Denial Strategies have become more important because denial is now the central purpose of American, Russian, British and French arsenals, and it is also becoming increasingly central in Chinese strategic thought. Beginning in 1987, Chinese thinking as moved from a limited deterrence doctrine, which falls between minimum and maximum deterrence doctrine and includes a limited nuclear war fighting capability. This has serious implications for India's emerging nuclear posture, which is discussed in detail in the next chapter.

Other related deterrence terms:

The other types of deterrence which range from collective deterrence, which is at the lowest rung of the ladder to maximum deterrence which is at the highest rung is outlined in the deterrence ladder below:

DETERRENCE LADDER

<u>TYPE OF DETERRENCE</u>	<u>STRATEGY</u>
Maximum	Massive retaliation
Mutually Aggressive	MAD (Mutually Assured Destruction)
Finite	Maximum deterrence with lowest finite arsenal
Limited	Defined arsenal including tactical nuclear weapons

4. R. Rajagopalan. 'Nuclear Deterrence', Asian Strategic Review 1998-99, p. 151.

Minimum	Lowest level of weapons that can cause such destruction which if imposed on the adversary would deter it
Existential	Credible nuclear arsenal, not necessarily country specific
Recessed	
Collective	Non-weaponised with option to weaponise, committed to no first use
response	No nuclear arsenals under national control. Multilateral Collective to rogue nuclear threat.

Source : Jasjit Singh, 'A Nuclear Strategy for India' in 'Nuclear India' (New Delhi: Knowledge World, 1998), p. 310.

Minimum Credible Deterrence and Recessed Deterrence:

The above terms are discussed a little more in detail since India's draft nuclear doctrine has opted for a 'minimum credible deterrence', while many leading analysts including Air Cmdre Jasjit Singh, Director IDSA, advocate recessed deterrence as an alternative. Minimum credible deterrence means the ability to retaliate with confidence and credible capability by a country, after an adversary has used his nuclear weapons against that country. Survivability of the nuclear arsenal therefore becomes a crucial characteristic so that an aggressor is not tempted to believe that his first strike will seriously degrade his opponent's ability to retaliate. The doctrine of minimum credible deterrence is based on the concept that the nuclear policy, strategy and posture would be based on the minimalist principle. The minimalist principle is in relation to the capability sought, size of the arsenal, the costs involved, the level of retaliation required and the nuclear posture to be adopted.

Recessed deterrence, on the other hand may be defined as “credible nuclear weapons capability, which a country is able to draw upon for political and diplomatic purposes and is able to deploy a nuclear arsenal within a defined time frame and effectively use it physically for military purposes”. In the Indian context Air Cmdre Jasjit Singh is of the opinion that a recessed deterrence posture itself would provide a fire-break in escalation of tensions beyond a certain level, whereas Rear Admiral Raja Menon holds a diametrically opposite view. According to him, “Recessed deterrence is a folly which does not differentiate between first and second strike, between vulnerable and invulnerable arsenals, between maintaining the stability of the status quo and the disadvantages of disturbing it.⁵ the size of India’s nuclear arsenal, its policy and nuclear posture will depend on whether it finally adopts minimum deterrence or recessed deterrence.

Counter Value and Counter Force Targets:

These terms relate to targets for nuclear weapons and also have their background in the post II World War era. In 1948, the Joint Chief of Staff of US prepared a war plan Called ‘Half Moon’ which was aimed at crippling the Soviet Union industrially using nuclear weapons. Seven targets were chosen and three atomic bombs per target. Each of these was termed counter value targets. It was in 1962 that Robert McNamara, US Secretary of Defence first proclaimed the ‘no cities’ doctrine, the aim being to pinpoint Soviet missile launch centers and military targets instead of industrial centers. These targets were termed counter force targets. In today’s nuclear terminology also, counter value refers to non-military targets and counter force to military targets.

5. Raja Menon, *A Nuclear Strategy for India*, (New Delhi: Sage 2000), p. 173.

First and Second Strike :

The terms first strike refers to a country launching its nuclear weapons first, either in a pre-emptive strike or to restore an unfavourable situation caused by the adversary's superiority in conventional forces. Prior to discussing the meaning and implications of the second strike, the different kinds of first strike are explained below.

Minimal Demonstrative First Strike :

This implies a small yield nuclear weapon fired at a pre designated target after warning and in an area where there is likely to be minimum damage to life and property. The aim of the strike is to warn the adversary that any further escalation would mean a more serious response. In the Indo-Pak scenario, this would be the first step in the nuclear escalation ladder by Pakistan in response to a conventional Indian thrust either in the plains of Punjab or the desert sector in Rajasthan.

First Strike on Tactical Battlefield Target :

This implies use of one or more weapons on a battlefield target. In the Indo-Pak scenario, this would occur after the demonstration strike in case there has been no response from India. The targets could be an Indian Armour concentration as depicted in an imaginary battle setting by General Sundarji in his book 'Blind Men of Hindoostan' or even airfields or important armed forces communication centers. In a strike of this kind collateral damage in terms of civilian casualties will be more as compared to the demonstration strike but less in comparison to a counter value strike.

Disarming First Strike:

This term implies that the devastation caused by the strike is such that the adversary is totally disarmed. In actual fact, the term 'disarming' is misleading. Whatever be the nuclear capability of a country, even if it releases all its nuclear weapons in one spasm, it can at best, severely degrade but never disarm its opponent. The point at issue is that in a 'disarming' first strike, a large number of targets will be counter force targets; the logic being to take out the adversary's capability to launch a riposte and destroy completely his nuclear capability, while restricting civilian casualties to a minimum. Even an attempt at a disarming first strike requires highly sophisticated weapons with low circular errors of probability and fairly large arsenals, both of which are presently non-existent in South Asia. But the temptation, especially by a smaller state like Pakistan to try and equip itself for such a strike is to set off an arms race in the South Asian Region.

Decapitation First Strike:

This term has also undergone a different interpretation today as compared to what it meant in the cold war era. During the earliest years of the cold war, when nuclear strategy and forces were unstructured, both sides planned to destroy everything possible, including the capital and the leadership. McNamara, in his first posture statement, in a speech at Anu Arloor, Michigan, on 16 June 1962, had implied that it was infructuous to target the enemy leadership as this would lead to a loss of control. Leaders of military missile systems had by then developed the theory that in the event of the loss of state leadership, all weapons would be fired at one go, a possibility that McNamara wished to avoid. Decapitation then became unfashionable. In the late 1970s, the US began to fear

decapitation partly because Soviet submarines operating off the east coast could destroy east-coast cities with very short missile flight times, and partly because the numbers of Soviet missiles made such targeting a possibility. In retrospect, it would appear that a surplus of missiles and warheads to essential target requirements is the one factor that might lead a country to look at a decapitation strike. This background is necessary to understand that small arsenals in the Indo-Pak scenario are unlikely to lead to such thoughts. Not so in the Chinese case, where the number of missile and warhead systems are luxuriously abundant as compared to the number of Indian targets. Could a decapitation strike be considered a possibility in the Indo-Chinese scenario? The answer is yes. However, in the year since McNamara, the meaning of decapitation has shifted significantly. Today, decapitation attempts to separate the command from the missile sites and this could be done largely by attacking the communication links. As stated earlier, a decapitation strike is a declaration of intent to wage all out nuclear war, and a step likely to be taken by the large nuclear power that could, in theory, launch a decapitation strike and yet retain sufficient superiority to cow the victim state into not retaliating. This is the position China would find itself in by 2010 when its arsenal modification is complete.⁶ An Indian command and control system would need to be built to withstand a decapitation strike.

Second Strike:

The term second strike does not mean just a nuclear response to an attacker's nuclear strike. A second strike capability implies not only a second strike, but also a residual capacity to launch an attack inflicting unacceptable damage to the

6. Raja Menon, *Ibid.* p. 256.

enemy. The second strike must take into account the loss, which would be suffered due to enemy's first strike, the losses which would be suffered after launch of own second strike, be it due to enemy's ABM capability or own aircraft carrying nuclear weapons being downed and account only for nuclear warheads which are expected to arrive at the adversary's target and inflict unacceptable damage. This capability is termed second-strike capability and is particularly relevant to India, which has adopted 'no first use; as part of its nuclear policy.

No First Use:

The term 'no first use' in nuclear terminology refers to the nuclear policy of a nuclear weapon state that it would not use its nuclear weapons first but would reserve the right to retaliate in kind, were it attacked with nuclear weapons. India and China are the only two nuclear weapon states, which have a policy of 'no first use'. USSR, which had been pursuing a 'no first use' policy, withdrew its pledge in June 1993 due to the changed realities in Europe.

India's 'no first use' policy has been criticized since it puts India at a disadvantage. Logically viewed, it is not so. A country would retain a first use policy only if perceived it weaker conventionally against its adversaries or harbors hegemonistic ambitions. In the Indian context, according to Gen. Sundarji, "the first reason does not apply to India apropos China in so far as deployable forces are concerned because China cannot deploy more forces in Tibet than what it can maintain there; as far as Pakistan is concerned there is no inferiority. The second reason does not apply to India since India neither wants to play regional policeman nor does it harbor any hegemonistic ambitions. Therefore, a sober mature status

quo power like India, a unilateral decision of 'no first use' is in keeping with its declared policy of endeavouring for peace in the region and global disarmament".⁷

Nuclear Reaction Threshold:

This is a term that has assumed increasing importance, especially in the nuclear stand off between India and Pakistan and the Kargil episode and its implications on nuclear deterrence between India and Pakistan. The meaning of the term and the implications in the South Asian context is explained below.

Notwithstanding nuclear deterrence between two states, if a conventional war breaks out between them and is being waged with nuclear capabilities not being used but with nuclear threat lurking in the background, it would be the endeavour of both sides not to push the other to a limit where the use of nuclear weapons in desperation becomes highly probable. This assessed limit is what is calling the NRT (Nuclear Reaction Threshold).

The Kargil crisis brought out some very valuable lessons regarding the nuclear reaction threshold for both India and Pakistan. According to Rear Admiral Raja Menon, "The disparity in the Indian and Pakistan views on where the South Asian nuclear threshold lies was plainly seen during Kargil crisis. It is obvious that Gen. Musharraf assumed the threshold to lie at an absurdly low level. Reports emanating Islamabad seem to indicate that they believed the nuclear threshold to lie very slightly beyond any Indian response. This, according to them, was a practical demonstration that nuclearisation had nullified India's conventional warfare advantage. India, blithely unaware of these beliefs, mobilized for full-scale war.

7. Sundarji, 'India's Nuclear Weapon Policy', 'Nuclear Rivalry and International Order' (Sage Publications, New Delhi, 1996) p. 180.

India had obviously assumed that the nuclear threshold lay at some distant point where Pakistan's vital national interests were affected. India was proved right. The Kargil crisis has demonstrated that the sub-continental nuclear threshold lies territorially in the heartland of both countries and not on the Cease Fire Line".⁸

The concept and practicality of the nuclear reaction threshold is of paramount importance to both, crisis stability and nuclear stability in the Indo-Pak equation.

The nuclear related terminologies explained above related to what has happened and has been happening recently in the Indo-Pak setting in South Asia. The terms, which are going to be explained, fall in the realm of the future. These terms will be related to the subject of the next chapter, that is, India emerging nuclear posture and the likely shape it is to assume. In that sense, though the terms are old, they are associated, as far as India is concerned, with what is to happen in the future. The explanation of the terms follows.

The NCA & NCP (National Command Authority & National Command Post):

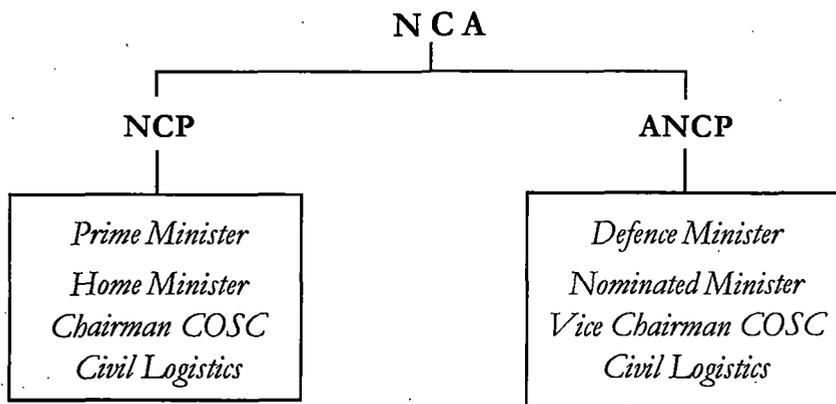
The NCA is the apex political body for making nuclear decisions in crisis, as well as after hostilities break out. In the Indian context the Prime Minister will head it. It will have a group for rendering necessary advice to the decision makers, which will consist of strategic, technical and civil service experts. It will also have the Responsibility for converting the political decision regarding nuclear response into executive action.

The NCP is the facility that enables the NCA to function effectively and communicate its decisions and monitors progress. It is essentially a robust

8. Raja Menon, Ibid. p. 116 & 197.

underground communication centre with ability to receive information and intelligence and disseminate these along with orders and instructions. If the NCA is the brain, the NCP is the nervous system including the sensory functions.

It stands to logic that the NCA would have to be split into two, one headed by the Prime Minister and another by a different political head. These two would perforce have to be physically separated to ensure security. This would entail location of the Prime Minister's party in one command post and the other party, to whom authority would have been delegated, in case of destruction of the Prime Minister's party, in an alternate command post. The suggested composition and division of the NCA into the NCP and ANCP (Alternate National Command Post) along with its functional objectives are given in the next page.



{Source: Raja Menon, 'A Nuclear Strategy for India' (New Delhi: Sage, 2000), p.270}.

Functional Objectives of a NCP:

- ➔ The ability to collect information of own and enemy forces unhindered during and after a nuclear attack.
- ➔ Continued safety of the personnel and equipment necessary to direct nuclear war.

- The ability to maintain uninterrupted communication to our own nuclear launch centers during and after nuclear attacks.

Nuclear Triad:

A nuclear triad implies a strategic nuclear force that has delivery capabilities that are simultaneously based on land, at sea and in the air, each leg of the triad having its own particular logic of existence and utility. Historically, air systems were the first to be developed in the form of bomber aircraft. The biggest disadvantage was that unlike the delivery systems that comprise the other two legs of the triad, it carries personnel on board. That, however, is also its biggest advantage since it is the only leg of the triad, which can be recalled after a launch. Land based delivery systems (SRBMs, IRBMs and ICBMs) which were developed next are the least expensive leg of the triad, but also most vulnerable to a first strike. The final leg of the triad is based at sea and consists of nuclear propelled fleet of ballistic missile submarines armed with Submarine Launched Ballistic Missiles (SLBMs). Easily the most expensive leg of the triad, this component is also most secure from a pre-emptive attack. Since nuclear submarines are mobile, and can remain submerged for months, they are virtually invulnerable. Therefore they are the most appropriate delivery system for an assured second-strike capability. The aspect of a nuclear triad assumes importance in the Indian context since the draft doctrine has spelt out that Indian nuclear forces will be based on the 'triad' concept.

‘All Horizons’:

An ‘all horizons’ nuclear capability, as the name suggests, is one that could strike anywhere on the planet. The nomenclature is derived from ‘tour azimuths’, the targeting, and doctrine of the French Nuclear Strike Force, ‘the force de frappe’. No policy maker or analyst in India except Bharat Karnad has ever publicly advocated an ‘all horizons’ nuclear capability for India. The merits and demerits of the triad and all horizons will be discussed in the next chapter.

India's Nuclear Doctrine and Its Emerging Nuclear Posture

India's draft nuclear doctrine, which was released on 17th August 1999, was very much in keeping with its philosophy of defensive defence (Full text of the doctrine is attached as appendix to the study).

It is intended in this chapter to examine India's emerging nuclear Posture in the backdrop of its stated nuclear doctrine. The implications of the doctrine are more important than the mere statement, for it is the implication that would shape the operational deployment and employment of India's nuclear weapons. The first question that arises is 'what does India's nuclear doctrine mean?' According to Ashley Tellis who has summed it up concisely "India's nuclear doctrine can be seen as a system of beliefs that both describes the utility of nuclear weapons to the state and identifies the manner in which these weapons will be deployed and used consistent with the purpose for which they have been acquired"¹ This statement has far reaching consequences in India's emerging nuclear posture.

Rather than to into the details of the nuclear doctrine, the full text of which is attached as annexure and is self-explanatory the key terms and their implications are given in the succeeding pages.

1. Ashley Tellis, 'India's Emerging Nuclear Posture' (Pittsburg: Rand, 2000) p. 260.

DRAFT NUCLEAR DOCTRINE

Key Terms and Implications:

KEY TERMS	IMPLICATIONS
1. 'Nuclear weapons remain instruments of national and collective Security' (Para 1.1 of Draft Doctrine)	Nuclear weapons are political instruments rather than military tools.
2. 'The fundamental purpose of Indian nuclear weapons is to deter the use and threat of use of nuclear weapons by any other state or entity against India' (Para 2.4 of Draft Doctrine)	Nuclear weapons are meant to be deployed and employed for deterrence and not for any other state or entity against India' war fighting.
3. 'India shall pursue a doctrine of minimum credible deterrence and a Policy of retaliation only'(Para 2.3 of Draft Doctrine)	The size of India's nuclear arsenal will be based on the 'minimalist' policy. 'India does not plan on huge arsenals or 'stock piling'. 'Retaliation only' phrase means no first use, details of which have been discussed in Chapter IV. Aspect of credibility is covered below.
4. 'Any nuclear attack on India and its forces shall result in punitive retaliation with nuclear weapons to inflict damage unacceptable to the aggressor' (Para 2.3 b of Draft Doctrine)	India's nuclear forces will be so organized and deployed to ensure its 'assured second strike capability'. Details of assured second strike capability are described in Chapter IV.

5. 'India's nuclear forces will be based on a triad ... ' (Para 3.1 of Draft Doctrine)	India proposes to go in for a SLBM (Submarine launched Ballistic Missile) capability as part to its operational on nuclear forces.
6. 'The doctrine envisages assured capability to shift from peacetime deployment to fully employable forces in the shortest possible time (Para 3.2 of Draft Doctrine)	India will shift from its present 'recessed deterrence' posture towards a robust and ready arsenal.
7. 'Nuclear weapons shall be tightly controlled and released for use at the highest political level' (Para 5.4 of Draft Doctrine)	Command and control of nuclear weapons is unlikely to devolve to the military. Induction of tactical nuclear weapons seems unlikely.
8. 'Space based and other assets shall be created to provide early warning communications, damage / detonation assessment'(Para 5.6 of Draft Doctrine)	India has no plans for creating an ABM (Anti Ballistic Missile) capability.

It is the translation of the above implications into operational deployment of India's nuclear weapons that is of concern primarily to Pakistan and then to China, US and the rest of the world in that order. India's emerging nuclear posture its development; operational deployment and employment of its nuclear weapons will be determined by three factors;

- Firstly, India's perception regarding what really deters i.e., Will 'recessed deterrence suffice or is there a requirement to go beyond ?' and if India is to go beyond recessed deterrence to minimum deterrence what is likely to be the type and size of its arsenal in a particular timeframe.

- ➔ Secondly, the economic aspect of creating a nuclear deterrent. While the triad concept with SLBMs offers the best in terms of credibility and survivability, can India afford it, when balanced with its developmental interests today? If the answer is 'No', what are India's options and which option is India likely to exercise?
- ➔ Thirdly, it is the aspect of 'acceptable risk and risk manipulation' by India that will define the size, delivery systems and state of readiness of its nuclear arsenals.

The above stated three variables impinge on each other and it is analysis of these three factors, which will eventually answer, the question as to whether "Does what is desirable match with what is possible". While it is possible to evaluate options and arrive at a conclusion, it is not possible to state that the conclusion arrived at is the 'correct' answer. However, the draft doctrine and its implications are a pointer to the direction of India's likely nuclear posture. Also a number of events post-Pokhran II explosions, including the low intensity conflict at Kargil have provided inputs as to the action and reaction of India after nuclearisation. This also is an indicator of its future posture. With this as the backdrop, the three variables are examined one by one in conjunction with India's draft doctrine to try and identify the following:

- ➔ Shape that India's nuclear posture is likely to take.
- ➔ Depending on the above is South Asia poised on the brink of an arms race?
- ➔ Is South Asia a nuclear flash point?

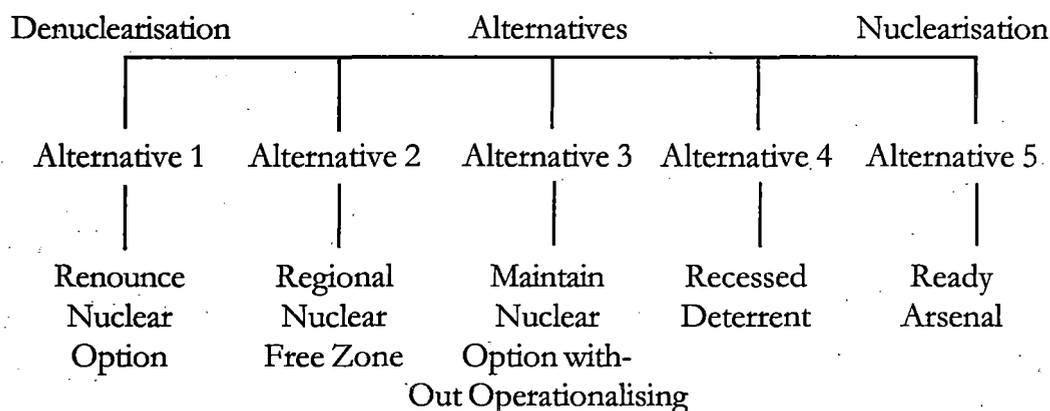
The First Factor: What really deters ?

There are two aspects to this question. The first aspect is the deterrence options available to nuclearised India. The second aspect is the size and operational readiness of the arsenal. Since the size of arsenal would depend on the option India is likely to adopt, two variants of the options as enunciated by Varun Sahni and Ashley Tellis are listed as under.

OPTIONS

Option 1	Option 2	Option 3
Non-weaponised	Minimal	Triad

(Source: 'Going Nuclear' by Varun Sahni in 'India and the Bomb' eds. D. Cortright And A. Mattoo, pp. 91-93).



(Source: Ashley Tellis, 'India's emerging nuclear posture', pp. 119).

Option 1 of Varun Sahni and Alternative 4 of Ashley Tellis are one and the same. The triad, which is Sahni's option 3, corresponds to Ready Arsenal, which is Tellis' Alternative 5. Alternatives 1, 2 and 3 spelt out by Tellis will have to be discarded without serious debate for obvious reasons. The choice for India now

lies between a recessed deterrent and a ready arsenal. Once it is established which of these two options India is likely to adopt the shape and size of the arsenal can be speculated upon.

Recessed deterrence Vs. Ready arsenal:

According to Late Gen. Sundarji a non-weaponized nuclear capability is certainly feasible for India, but the option is viable only if it is adopted in an event agreement with Pakistan.² Gen. Sundarji later while expanding on the theory of nuclear deterrence finally opts for minimal deterrence as the best option for India in his famous book on nuclear strategy, 'Blind men of Hindoostan'.

Air Cmdre Jasjit Singh on the aspect of recessed deterrence supports it and states, 'While minimum deterrence is the capability we would aim for within a limited time frame, the interim posture would also require a credible strategy and posture. Our interim needs could be met by a doctrine and strategy of recessed deterrence.'³

Both Sundarji's and Jasjit Singh's stand for a recessed deterrent has one major drawback. The China factor has not been taken into account. Any bilateral tie up for a recessed deterrence between India and Pakistan will hold no meaning, so long as China continues with its nuclear build up and a recessed deterrence posture without taking Chinese future nuclear arsenal into consideration will place India in a position of serious strategic vulnerability. The Indian nuclear doctrine that has spelt out a minimum deterrence also suggests India will move from its present

2. K. Sundarji, 'Indian Nuclear Doctrine – II', Indian Express, 26 Nov. 1994.

3. Jasjit Singh, 'A Nuclear Strategy for India', 'Nuclear India' (New Delhi: Knowledge World, 1998)

position of recessed deterrence towards weaponization. Ashley Tellis has also commented "The desire for minimum deterrence suggests that New Delhi is not satisfied with the alternative of a recessed deterrent as an end state".⁴

In the words of Rasgotra, former Indian Foreign Secretary, "What was the point of Pokhran II, of unveiling our nuclear muscle, if we are to now submit to the indignity of reversion to a non-nuclear weapon state status? There are bound to follow even stronger pressures on us to sign the NPT and to desist from testing, developing and deploying missiles, without which there can be no credible nuclear deterrent. Surely, all this is recipe for making India a nuclear eunuch".⁵

From the above argument it is clear that nuclear policy analysts' views, public opinion and security concerns dictate that India will definitely move beyond its present recessed deterrence towards minimal credible deterrence. The next step is to analyse in terms of numbers what 'minimal' could mean in probable size of India's nuclear arsenal.

Probable size of India's Nuclear Arsenal :

Since the number of weapons fielded would be subject to constant change depending on a number of factors, the probable size of India's arsenal by 2010 with the existing politico strategic scenario will be calculated. Again since there have been no official declarations by the government, a comparison of a number of serious studies on the subject and views of acknowledged experts will have to be taken into account to arrive at a reasonable figure.

4. Ashley Tellis, Ibid. p. 249.

5. Rasgotra, 'Making India a Nuclear Eunuch', The Pioneer, 01 Apr 1999.

Vijay Nair's Study:

The most comprehensive study of a triad nuclear capability for India is by Brig V K Nair.⁶ He suggests of force consisting of 132 nuclear warheads of four different yields: 1 megaton, 200-500 kilotons, 20-50 kilotons and 15 kilotons. The sea, air and land leg of the triad would be organized as under:

Sea leg:

Five SSBNs. Three for deterrence requirements against China, two on patrol, one in reserve and two against Pakistan; one in patrol and one reserve. Each of the SSBNs would carry 16 SLBMs and the entire SLBM inventory including reserves would consist of 80 missiles.

Land based system:

These would comprise of 12 Prithvi SRBMs and 36 Agni MRBMs, all aimed at counter force targets.

Air leg:

This would consist of combat aircraft already in the Indian inventory and would have an exclusively counter value role.

Gen. Sundarji's assessment:

"For minimum deterrence it can be said that in case of the adversary being a small country even up to 1 MT (megotonnage) say (50x20 kiloton weapons might do). Even for deterring a large country one is most unlikely to require more than 4 MT". After factoring in reliability parameters and possible losses

6. Nair, 'Nuclear India' (New Delhi:

Sundarji concluded that a low estimate of 90 weapons and upper estimate of 135 weapons would be reasonable".⁷

K. Subrahmanyam's assessment:

K. Subrahmanyam advocated an unclear force consisting of 60 standard 125-kiloton warheads. He suggested that 20 of these warheads could be mounted on aircraft combined with 20 Prithvi SRBMs and 20 Agni IRBMs. He makes no mention of the sea leg or the triad concept.⁸

Raja Menon's assessment :

Rear admiral Raja Menon's assessment is based on the triad concept.

Sea leg :

The SIMB force would consist of six nuclear submarines with twelve missiles per submarine. Raja Menon advocates MIRVing of the missiles to increase number of warheads reaching the target.

Land based :

Raja Menon argues for nuclear weapons based on IRBMs and ICBMs and 24 nuclear tipped cruise missiles.⁹

Bharat Karnad's assessment :

Karnad's has been the most outlandish assessment. He argues that India requires the ability to interdict 60 primary targets in China and Pakistan, there by

7. Sundarji, 'Blind Men of Hindoostan' (New Delhi: UBS, 1993), p. 67.

8. K. Subrahmanyam, 'Nuclear Force Design and Minimum Deterrence Strategy for India' (New Delhi: Viking, 1994). pp. 179-195. Lancer, 1992), pp. 171-172.

9. Raja Menon, 'A Nuclear Strategy for India', (New Delhi: Sage, 2000). pp.

necessitating a nuclear force of well over 300 weapons, most of which must be high yield thermo nuclear devices.¹⁰ The break down given by Karnad is as under

- 4x SSBNs with 12 SLBMs each.
- 25 ICBMs.
- 40 IRBMs.
- 70 Manual aircraft.
- 70 air to surface missiles.
- 25 atomic demolition munitions.

Air Commodore Jasjit Singh's assessment :

It is difficult to visualize an arsenal with anything more than a double digit quantum of warheads over the next few years and it may be prudent to even plan on the basis of a lower end figure of say 2 to 3 dozen nuclear warheads by the end of 10 to 15 years.¹¹

The common factor, which has been the basis for calculation for the size of the arsenal, has been the number of counter-force and counter value targets aimed at China and Pakistan. Except for Karnad who has gone in for and all horizons capability and Jasjit Singh who has not speculated beyond recessed deterrence, the other specialists have assumed that targeting a total of about 20 conurbations involving 20 to 25 nuclear engagements is what will be required for India to have a minimum credible deterrence.

10. Karnad, 'A Thermonuclear deterrent', p 146.

11. Jasjit Singh, Ibid, p 315

To quote Deepa M Oilapally “In the avid debate regarding the level of weaponisation two levels most often discussed are either in the low range of 60-130 weapons or in the high range of 300-400. The triadic survivable nuclear force mentioned in the draft doctrine suggests that the lowest numbers mentioned are likely to be surpassed. The issue now appears to have shifted to whether a low three digit number would be better than higher three digit number”¹².

Statements by India’s Prime Minister Vajpayee, national security advisor Brajesh Mishra and strategic analyst Jasjit Singh suggest that India would not seek more than a minimum but credible nuclear deterrent, as a minimum deterrence implies a defensive orientation for India’s nuclear forces and a commitment to avoid a nuclear arms race and even in the worst-case scenario¹³. Hence the maximum capability that India would ever need is of minimum deterrence and therefore there is no risk of an open-ended arms race in the subcontinent. This implies, firstly India would *settle for a modest arsenal of 150 nuclear weapons with small yields of about 20 kt and secondly, an arms race in the sub-continent can be virtually ruled out.*

Now that it has been concluded that India needs to move beyond recessed deterrence to a modest arsenal, the second factor of costs, which also impinges on it nuclear, posture is discussed.

The Second Factory: Economic Aspects :

Raja Chellaney has summed up India’s dilemma as,

“The glaring mismatch India has to tackle is between its economic capacity and security needs. Without economic power, India can have no security even with nuclear weapons”¹⁴.

12. Oilapally, ‘India’s Strategic Doctrine and Practice’, India’s Nuclear Security (New Delhi; Vistaar, 2000) p 79.

13. Ashley Tellis, *ibid*, p. 375

14. Raja Chellaney, ‘India’s Trial by Atom’, *Hindustan Times*, 4 Nov 1998

There have been two more coherent and plausible estimates of a weaponisation programme, both prepared by retired defence personnel. One was a broad-brush calculation made by the former Chief of Army Staff Gen. Sundarji and the other by Brig. Vijai K. Nair in 1992.

Gen. Sundarji's notion of a minimum deterrent was an arsenal of 150 bombs that could be delivered by aircraft and missiles. His cost estimate was a very affordable 2,760 crore rupees at 1996 prices. With the required aircraft already with the IAF, the only expenses to be incurred were the costs of the bombs and the missiles.

For an arsenal of roughly the same size, Brig. Nair in 1992 projected a total cost of Rs.6835 crore over a 10-year period. While Gen. Sundarji made no provision for C31 on the implausible ground that such costs are common to conventional force requirements and are not to be taken as incremental costs, Brig. Nair's estimate included about Rs.3, 500 crore for C31 testing and maintenance.

In the three months since the Pokhran tests a number of independent estimates have been made of the total costs of an Indian weaponisation programme. These range from Rs.5, 000 crore to Rs.20, 000 crore over the next decade. But none of them has any meaning since they have either been arrived at by inflating past estimates to present day prices or are the sum total of the cost of a list of components that has been arbitrarily drawn up without reference to any nuclear doctrine or to the likely composition of an Indian nuclear arsenal.

In 1985 a committee of senior defence personnel and representatives from defence and nuclear energy research establishments prepared an estimate of a weapons programme.

The group is supposed to have projected that a minimum deterrent comprising of aircraft, Agni and Prithvi missiles and a nuclear arsenal in the low three digit figures would come to Rs.7, 000 crore at 1985 prices.

Significantly this group does not appear to have included nuclear powered submarines in its plan for an Indian minimum deterrent nor did it make any provision for a C31 system. The estimate was also apparently drawn up in over just a fortnight.

In keeping with the earlier assessment of India's requirement of a second strike capability comprising of a triad delivery of 150 bombs, an accurate estimate of costs involved are presented in tabulated form with explanatory notes following later.

INVESTMENT COST OF NUCLEAR WEAPONISATION

	Rs. (in millions)
1. One reactor to produce plutonium	7,000
2. One missile production facility	5,000
3. Cost of a 150 bomb arsenal	6,000
4. Cost of missiles	40,250
55 <i>Prithvis</i>	3,850
30 <i>Agnis</i>	15,000

25 Agni-IIIs	15,000
16 Sagarikas	6,400
5. Cost of fitting one IAF squadron	600
6. Cost of 3 n-submarines	1,20,000
7. Cost of C31	35,250+
8. Cost of two satellites	20,000
9. Cost of radar, missiles etc. to protect airbases/launch sites	50,000
Total	2,80,000

{Source: C. Rammanohar Reddy, 'The Wages of Armageddon', 'Out of the Nuclear Shadow' (Delhi: Rainbow, 2001). pp. 147-153}

It is assumed that weaponisation will be carried out over a decade. All costs are at current prices. No account is taken of sunk costs since the attempt is only to estimate the future costs of nuclearisation.

Author's Note:

The cost estimates have been drawn from what little has been published and from discussions with nuclear analysts, security experts, former and serving defence personnel.

The amplification of the tabulated costs is given below:

Cost of plutonium:

At best, India's current stocks of weapons grade plutonium are likely to suffice for no more than 50 bombs. To equip an additional 100 warheads each of 15 to 20 KT, about 800 Kg. of plutonium has to be produced. Neither the power nor the research reactors can yield so much plutonium in a decade. Hence, a new

reactor is required. Of course, it will be a different matter if the Fissile Material Cut-off Treaty is negotiated over the next few years and India becomes a signatory.

Capital cost: Rs.700 crore.

Cost of a missile production facility:

A separate establishment has to be set up to produce the 120+ *Prithvis*, *Agnis*, *Agni-II*s and *Sagarikas*. Capital cost: Rs.500 crore.

Cost of bombs:

Estimates of a nuclear bomb of 15-20 KT vary from Rs.1 crore to Rs.15 crore. According to Mr. Stephen Schwartz of the Brookings Institution, a no-frills 15-20 KT bomb should cost between only \$1 million and \$2 million. On the assumption that the lower end of this estimate is a more realistic, one, and the cost per bomb will be Rs.4 crore.

Delivery systems – aircraft:

The IAF'S existing fleet of Mirage 2000s, Jaguars and Sukhoi 30s can be used for delivery. However, the aircrafts have to be specially fitted for carrying the nuclear bombs. It is assumed that one squadron of 24 aircraft will be equipped for a nuclear strike. The cost of equipping each aircraft is Rs.2 crore to 5 crore.

Delivery Systems-nuclear submarine:

The general view is that India needs five nuclear-powered submarines for its nuclear force. However, according to Admiral L. Ramdas, it will be impossible to build five submarines in a decade at best three can be built. But how does one treat the costs of these submarines? Brig. Nair, in his exercise, assumed that they

were in any case going to be acquired by the Navy, so there was no need to cost them for a nuclear program. This seems to be a UN realistic assumption. Hence, the cost of three submarines has been taken into account, with another two to be built later. The capital cost per submarine is Rs.4, 000 crore.

Delivery system-missiles:

If from an arsenal of 150 bombs one IAF squadron is equipped to carry out a nuclear strike that will leave 126 missiles to be tipped with warheads. A certain hypothetical mix of the missiles is assumed. The *Agni-II* was test fired in 1999 the *Sagarika* is under development. The present indication is that the *Sagarika* will be a 300-Km distance cruise and not a submarine – launched ballistic missile. Since *Agni-II* will be a longer-range version of the *Agni*, it has been assumed that it will cost about 20 percent less. Cost of each *Prithvi*: Rs.7 crore, cost of each *Agni*: Rs.50 crore, cost of each *Agni-II*: Rs.60 crore and cost of each *Sagarika*: Rs.40 crore.

The C31 systems:

The shape of a likely C31 system is not known nor is any information available about the cost of individual components. As a first approximation it is assumed that at the very least the expenditure will be of the magnitude suggested by Brig. Nair in 1992. After adjusting for inflation, this comes to about Rs.3, 525 crore. However, the actual expenditure will be higher since Brig. Nair assumed that much of the cost required for a reliable C31 system would be borne by the on going process of modernization of the defence forces.

One additional item that has been coasted here is that of two high-resolution satellites to track developments in China and Pakistan. This is a bare minimum. It is sometimes argued that such systems are meant to 'win' a nuclear war and are not required for an Indian second-strike capability. This may not be a tenable assumption since without any kind of monitoring or protection; the chances are that the Indian nuclear arsenal will almost be completely destroyed in the first strike itself. Hence, the cost of a C31 system: Rs.3, 525+ crore: the cost of two satellites: Rs1, 000 crore each.

Defence systems :

It has been argued that the process of modernization is in any case strengthening the radar and defence systems. Yet, it does not stand to reason that special defences for the nuclear force are unnecessary. Experts such as Lt. Gen. Raghavan argue that to safe guard the nuclear submarine fleet, 'we shall also need a small protective surface naval and aircraft carrier-based capability to ensure the survival of (the) submarines. 'No estimates are available of the costs of such a fleet. However, account here is taken of phased array radars and anti-missile batteries to protect four or five missile sites and air bases. Cost: Rs.5, 000 crores.

The total future costs of weaponisation come to Rs.28, 000+ crore at current prices. Going by current figures the annual costs will be equivalent to about 0.5% GDP for ten years running.

A brief look at India's developmental needs and the state of its economic infrastructure post Pokhran II will give an ideal of whether India will be able to afford its nuclear arsenal.

According to Prem Shankar Jha “Without cutting down drastically on its fiscal deficit needs India will no longer be able to finance its infrastructure development. Between 1989-90 and 1994-95 the share of public sector development expenditure in GDP fell from 22.1% to 15.7%, expenditure on defence dropped from 3.4% to 2.5% of GDP. The Government has transferred more than 8% of GDP from investment or defence into consumption. The brunt of former cuts has fallen on the infrastructure sector. In 1989 the country spent only 3.36% of GDP on education and culture for which India requires a minimum of 6% of GDP today. India spent a paltry 1.56% on housing, urban development, sanitation and water supply together; the requirement today is a minimum of 5 to 6% of GDP.”¹⁵

For India to simultaneously balance its developmental needs with its ability to develop great power capability by 2015, its economy will have to grow at a pace of 7% per annum. If India pursues, relentlessly, its policy of a triadic nuclear structure, Western Powers reluctance to support the country’s economic modernization may cause failure of sustained economic growth.

In the economic-nuclear equation India has three options presently:

- ➔ Option 1 Go ahead for a triad arsenal incorporating full fledged C4 I 2 systems and hope India’s economic progress will be as planned (growth rate of 7% per annum).

15 Prem Shankar Jha, ‘The Indian Economy’, India’s Nuclear Security (New Delhi; Vistaar, 2000).

- Option 2 In case of economic slowdown accepts a 'ragged' nuclear capability or 'ramshackle deterrence' rendering India nuclearly vulnerable.
- Option 3 Postpone the induction of the sea leg of the triad but ensure induction of quality C4 I 2 systems so that security concerns are not compromised. Substantial savings in cost would accrue, as the sea leg of the triad, is the most expensive.

The option that India would choose will in turn depend on the third factor, which is India's willingness to accept risks.

The Third Factor: Acceptance of Risk and Risk manipulation:

The extent up to which India is willing to accept risks is the third factor that will decide the shape and size of India's nuclear arsenal. The military diplomatic initiative is all about manipulating risk. Two excellent examples given by Raja Menon bring out the essence of risk manipulation.

"When the allies put 12000 soldiers into Berlin, they were not intended to stop the Russians militarily, but a Russian invasion of Berlin would have caused the death of 12000 allied soldiers, a risk which the allies challenged the Russians to take. Risk manipulation is over 2500 years old and goes back to the anecdote where Xenophon, the Greek General placed his 10000 strong army with their backs against a precipice when attacked by a marginally superior Persian force, a challenge Persians declined to accept".¹⁶

The recent response to Kargil and present mobilization of troops on its borders suggest that India is not totally averse to risk manipulation. But this is only

¹⁶ Raja Menon, Ibid. p.34.

To remove itself from being placed in a position of disadvantage rather than to use risk manipulation for active coercion.

The next and concluding chapter will summarise in brief, the conclusions arrived which have been arrived at. These conclusions have been based on analysis of the above three factors as well as the nuclear programmes of India and Pakistan. These factors would govern the shape and size of India's nuclear arsenal. It is this emerging nuclear posture, which will determine whether South Asia would move towards nuclear stability or away from it.

Conclusion

While nuclearisation should have brought about stability owing to fear of nuclear war. Pakistan has instead upped the status in brinkmanship. The game of brinkmanship requires a mutual withdrawal and this is possible only if there is some space to withdraw something one cannot do from a state of passive defence, which brings us to the point of Indian willingness to accept risks. The first aspect of risk manipulation is that India is not totally averse to risk manipulation. This has been explained earlier. The second factor is regarding its nuclear capability. If India wants to take no risks at all in ensuring its launch on command capability, it will go in for a large nuclear arsenal coupled with an elaborate command and control system. But since India has already accepted the risk of a first strike, due to its second strike capability, it is likely to focus on a simple command system, which assures a credible retaliatory capability. When this risk taking and risk manipulation is translated into real term capability, it again points to a modest and affordable arsenal coupled with a simple but effective command and control system.

The analysis of the three factors in the previous chapter and of India's and Pakistan's nuclear programmes bring out the following conclusions:

⇒ India was forced to convert its peaceful nuclear programme into a weapons related one due to the change in the strategic environment internationally and regionally. The transformation was more due to change in the region and was facilitated by India's legacy bequeathed to it by its civilization and

culture. The transition, however, is in keeping and attuned to the requirements of today's international power politics.

- ⇒ India will move beyond recessed deterrence to weaponisation.
- ⇒ India's nuclear arsenal over the next decade is likely to stabilise at about 120 weapons with 20 KT yields.
- ⇒ India's economic compulsions, international opinion and the strong anti bomb lobby may not permit full-fledged development of its triadic deterrent capability.
- ⇒ India will establish a simple but effective command and control system with emphasis on an assured second-strike capability. According to Ashley Tellis "India's indigenous nuclear command system has no parallels anywhere in the world".¹⁷
- ⇒ India's risk taking and risk manipulation posture and the assessed size and shape of its nuclear arsenal emphasizes its commitment to defensive defence; hence the unlikelihood of either an arms race or nuclear confrontation in the region.

Finally, this type of arsenal termed as a 'force in being' by Ashley Tellis has a distinguishing characteristic, which is quiescence at the operational level, but not inactivity at the strategic level of politics. In fact it bestows the advantage of political choice by being active at the grand strategic levels of diplomacy. Its very existence as a potentially complete but dormant capability serves as a deterrent to possible adventurism by Pakistan. It constantly hovers in an adversary's

17. Ashley Tellis Ibid. p.471.

consciousness, commands its attention, keeps it at bay and makes the adversary constantly think of nothing but being on guard against the terrible attack that would follow in retaliation against any of its provocations.¹⁸

India would thus be assured of the effectiveness of its deterrent capability, ensuring its security, while at the same time effectively checking a runaway arms race, which would destabilize the region. India and Pakistan will of course have to traverse a long way to bridge the nuclear gap caused by secretiveness, ambiguity and non-transparency. In the long run, India's nuclear deterrent coupled with confidence building measures may well pave the way towards stability and eventual peace in the region.

18. Ashley Tellis, *Ibid*, p368.

ANNEXURE - I

Draft Report of National Security Advisory Board

On

Indian Nuclear Doctrine

August 17, 1999

1. Preamble :

- 1.1. The use of nuclear weapons in particular as well as other weapons of mass destruction constitutes the gravest threat to humanity and to peace and stability in the international system. Unlike the other two categories of weapons of mass destruction, biological and chemical weapons which have been outlawed by international treaties, nuclear weapons remain instruments for national and collective security, the possession of which on a selective basis has been sought to be legitimised through permanent extension of the Nuclear Non-Proliferation Treaty (NPT) in May 1995. Nuclear weapon states have asserted that they will continue to rely on nuclear weapons with some of them adopting policies to use them even in a non-nuclear context. These developments amount to virtual abandonment of nuclear disarmament. This is a serious setback to the struggle of the international community to abolish weapons of mass destruction.
- 1.2. India's primary objective is to achieve economic, political, social, scientific and technological development within a peaceful and democratic framework. This requires an environment of durable peace and insurance against potential

risks to peace and stability. It will be India's endeavour to proceed towards this overall objective in cooperation with the global democratic trends and to play a constructive role in advancing the international system toward a just, peaceful and equitable order.

- 1.3. Autonomy of decision making in the developmental process and in strategic matters is an inalienable democratic right of the Indian people. India will strenuously guard this right in a world where nuclear weapons for a select few are sought to be legitimised for an indefinite future and where there is growing complexity and frequency in the use of force for political purposes.
- 1.4. India's security is an integral component of its development process. India continuously aims at promoting an ever-expanding area of peace and stability around it so that developmental priorities can be pursued without disruption.
- 1.5. However, the very existence of offensive doctrine pertaining to the first use of nuclear weapons and the insistence of some nuclear weapons states on the legitimacy of their use even against non-nuclear weapon countries, constitute a threat to peace, stability and sovereignty of states.
- 1.6. This document outlines the broad principles for the development, deployment and employment of India's nuclear forces. Details of policy and strategy concerning force structures, deployment and employment of nuclear forces will flow from this framework and will be laid down separately and kept under constant review.

2. Objectives :

- 2.1. In the absence of global nuclear disarmament, India's strategic interests require effective, credible nuclear deterrence and adequate retaliatory capability, should deterrence fail. This is consistent with the UN Charter, which sanctions the right of self-defence.
- 2.2. The requirements of deterrence should be carefully weighed in the design of Indian nuclear forces and in the strategy to provide for a level of capability consistent with maximum credibility, survivability, effectiveness, safety and security.
- 2.3. India shall pursue a doctrine of credible minimum nuclear deterrence. In this policy of "retaliation only", the survivability of our arsenal is critical. This is a dynamic concept related to the strategic environment, technological imperatives and the needs of national security. The actual size, components, deployment and employment of nuclear forces will be decided in the light of these factors. India's peace-time posture aims at convincing any potential aggressor that:
 - (a) Any threat of use of nuclear weapons against India shall invoke measures to counter the threat; and
 - (a) Any nuclear attack on India and its forces shall result in punitive retaliation with nuclear weapons to inflict damage unacceptable to the aggressor.
- 2.4. The fundamental purpose of Indian nuclear weapons is to deter the use and threat of use of nuclear weapons by any State or entity against India and its forces. India will not be the first to initiate a nuclear strike but will respond with punitive retaliation should deterrence fail.

2.5. India will not resort to the use or threat of use of nuclear weapons against States, which do not possess nuclear weapons or are not aligned with nuclear weapon powers.

2.6 Deterrence requires that India maintain :

- (b) Sufficient, survivable and operationally prepared nuclear forces.
- (c) A robust command and control system.
- (d) Effective intelligence and early warning capabilities.
- (e) Comprehensive planning and training for operations in line with the strategy and;
- (f) The will to employ nuclear forces and weapons.

2.7. Highly effective conventional military capabilities shall be maintained to raise the threshold of outbreak both of conventional military conflict as well as that of threat or use of nuclear weapons.

3. Nuclear Forces :

3.1. India's nuclear forces will be effective, enduring, diverse, flexible and responsive to the requirements in accordance with the concept of credible minimum deterrence. These forces will be based on a triad of aircraft, mobile, land-based missiles and sea-based assets in keeping with the objectives outlined above. Survivability of the forces will be enhanced by a combination of multiple redundant systems, mobility, dispersion and deception.

3.2. The doctrine envisages assured capability to shift from peacetime deployment to fully employable forces in the shortest possible time and the ability to retaliate effectively even in a case of significant degradation by hostile strikes.

4. Credibility and Survivability :

The following principles are central to India's nuclear deterrent:

4.1. Credibility :

Any adversary must know that India can and will retaliate with sufficient nuclear weapons to inflict destruction and punishment that the aggressor will find unacceptable if nuclear weapons are used against India and its forces.

4.2. Effectiveness :

The efficacy of India's nuclear deterrent be maximised through synergy among all elements involving reliability, timeliness, accuracy and weight of the attack.

4.3 Survivability :

India's nuclear forces and their command and control shall be organised for very high survivability against surprise attacks and for rapid punitive response. They shall be designed and deployed to ensure survival against a first strike and to endure repetitive attrition attempts with adequate retaliatory capabilities for a punishing strike, which would be unacceptable to the aggressor.

Procedures for the continuity of nuclear command and control shall ensure a continuing capability to effectively employ nuclear weapons.

5. Command and Control :

- 5.1.** Nuclear weapons shall be tightly controlled and released for use at the highest political level. The authority to release nuclear weapons for use resides in the person of the Prime Minister of India or the designated successor(s).
- 5.2.** An effective and survivable command and control system with requisite flexibility and responsiveness shall be in place. An integrated operational plan or a series of sequential plans, predicated on strategic objectives and a targeting policy shall form part of the system.
- 5.3.** For effective employment, the unity of command and control of nuclear forces, including dual capable delivery systems, shall be ensured.
- 5.4.** The survivability of the nuclear arsenal and effective command, control, communications, computing, intelligence and information (C⁴I²) systems shall be assured.
- 5.5.** The Indian defence forces shall be in a position to execute operations in an NBC environment with minimal degradation.
- 5.6.** Space based and other assets shall be created to provide early warning, communications, and damage/detonation assessment.

6. Security and Safety :

6.1. Security :

Extraordinary precautions shall be taken to ensure that nuclear weapons, their manufacture, transportation and storage are fully guarded against possible theft, loss, sabotage, damage or unauthorised access or use.

6.2. Safety :

Safety is an absolute requirement and tamper-proof procedures and systems shall be instituted to ensure that unauthorised or inadvertent activation/use of nuclear weapons does not take place and risks of accident are avoided.

6.3. Disaster control :

India shall develop an appropriate disaster control system capable of handling the unique requirements of potential incidents involving nuclear weapons and materials.

7. Research and Development :

- 7.1. India should step up efforts in research and development to keep up with technological advances in this field.
- 7.2. While India is committed to maintain the deployment of a deterrent, which is both minimum and credible, it will not accept any restraints on building its R&D capability.

8. Disarmament and Arms Control :

- 8.1. Global, verifiable and non-discriminatory nuclear disarmament is a national security objective. India shall continue its efforts to achieve the goal of a nuclear weapon-free world at an early date.
- 8.2. Since no-first use of nuclear weapons is India's basic commitment, every effort shall be made to persuade other States possessing nuclear weapons to join an international treaty banning first use.

- 8.3. Having provided unqualified negative security assurances. India shall work for internationally binding unconditional negative security assurances by nuclear weapon states to non-nuclear weapon states.
- 8.4. Nuclear arms control measures shall be sought as part of national security policy to reduce potential threats and to protect our own capability and its effectiveness.
- 8.5. In view of the very high destructive potential of nuclear weapons, appropriate nuclear risk reduction and confidence-building measures shall be sought, negotiated and instituted.

ANNEXURE - II

LIST OF ABBREVIATIONS

AEC	- Atomic Energy Commission
AEE	- Atomic Energy Establishment
ANCP	- Alternate National Command Post
BJP	- Bharatiya Janata Party
C 31	- Command Control Communication Intelligence
C 412	- Command Control Communication Computers Information Intelligence
CEP	- Circular Error of Probability
CENTO	- Central Treaty Organisation
CSIR	- Council of Science and Industrial Research
CTBT	- Comprehensive Test Ban Treaty
CHASNUPP	- Chashma Nuclear Power Plant
DAE	- Department of Atomic Energy
FBR	- Fast Breeder Reactor
GDP	- Gross Domestic Product
IAEA	- International Atomic Energy Agency
IAF	- Indian Air Force
ICBM	- Inter Continental Ballistic Missile
IGDMP	- Integrated Guided Missile Development Programme

IRBM	-	Intermediate Range Ballistic Missile
KANNUP	-	Karachi Nuclear Power Plant
Kg	-	Kilogram
KT	-	Kiloton
MAD	-	Mutually Assured Destruction
MEA	-	Ministry of External Affairs
MIRV	-	Multiple Independent Re Entry Vehicle
MRBM	-	Medium Range Ballistic Missile
MT	-	Megaton
MW	-	Megawatt
NCA	-	National Command Authority
NCP	-	National Command Post
NPT	-	Non Proliferation Treaty
NSAB	-	National Security Advisory Board
PAEE	-	Pakistan Atomic Energy Establishment
PARR	-	Pakistan Atomic Research Reactor
PINSTECH	-	Pakistan Institute of Science and Technology
PNE	-	Peaceful Nuclear Explosion
PSLV	-	Polar Satellite Launch Vehicle
PTBT	-	Partial Test Ban Treaty
SLBM	-	Submarine Launched Ballistic Missile
SNEP	-	Subterranean Nuclear Explosion Project

- SRBM - Short Range Ballistic Missile
- SSBN - Submarine Nuclear Ballistic Missile
- SSM - Surface-to-Surface Missile
- UK - United Kingdom
- UN - United Nations
- USA/US - United States of America.

Select Bibliography

- ◆ Albright, D., Berkhour, F. and Walker W., 1997. *Plutonium and Highly Enriched Uranium 1996: World Inventories Capabilities and Policies*. Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Aron, R., 1963. *Le grand débat, initiation à la stratégie atomique* (The Great Debate, Introduction to Atomic Strategy), Paris : Calmann-Levy.
- ◆ Anthony, I. & Rotfeld, A.D., Eds, 2001. *A Future Arms Control Agenda: Proceedings of Nobel Symposium 118, 1999*. Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Bailey, S.D., 1972, *Prohibitions and Restraints in War*. London, Oxford, New York: Oxford University Press.
- ◆ Barnaby, F., Goldblat, J., Jasani, B. & Rotblat, J., Eds, 1979. *Nuclear Energy and Nuclear Weapon Proliferation*. London: Stockholm International Peace Research Institute (SIPRI) and Taylor & Francis.
- ◆ Beaton, L. & Maddox, J., 1962. *The Spread of Nuclear Weapons*. London: Chatto and Windus.
- ◆ Bernauer, T., 1990. *The Projected Chemical Weapons Convention: A Guide to the Negotiations in the Conference on Disarmament*. New York, United Kingdom.
- ◆ Bernauer, T., & Ruloff, D., Eds, 1999. *The Politics of Positive Incentives in Arms Control*. Columbia, South Carolina: University of South Carolina Press.
- ◆ Blackaby, F., Goldblat, J. & Lodgaard, S., Eds, 1984. *No-First-Use*. London, Philadelphia: Stockholm International Peace Research Institute (SIPRI) and Taylor & Francis.

- ◆ Blackaby, F., & Milne, T., Eds, 2000. *A Nuclear-Weapon-Free World: Steps along the Way*. Houndmills, Basingstoke, Hampshire and London: Macmillan.
- ◆ Blacker, C.D. & Duffy, G., 1984. *International Arms Control*. Stanford, California: Stanford University Press.
- ◆ Blair, B.G., 1995. *Global Zero Alert for Nuclear Forces*. Washington, DC: Brookings Institution.
- ◆ Bogdanov, O.V., 1972, *Razoruzhenie Garantia Mira* (Disarmament – Guarantee of Peace). Moscow: Izdatelstvo Mezhdunarodnye Otnoshenia.
- ◆ Brauch, H.G., ed., 1986. *Vertrauens-Bilende Massnahmen und Europäische Abrüstungskonferenz* (Confidence-building Measures and the European Disarmament Conference). Gerlingen: Bleicher Verlag.
- ◆ Bring, O., 1987. *Nedrustningens folkrätt* (International Law of Disarmament). Stockholm: Norstedts.
- ◆ Bull, H., 1965. *The Control of the Arms Race*. New York: Praeger.
- ◆ Burns, E.L.M., 1972. *A Seat at the Table*. Toronto: Clarke, Irwin & Company.
- ◆ Cafilisch, L. & Tanner F., Eds, 1989. *The Polar Regions and Their Strategic Significance*. Geneva: Graduate Institute of International Studies.
- ◆ Carlton, D. & Shaerf, C., Eds, 1975. *The Dynamics of the Arms Race*. London: Croom Helm.
- ◆ Catrina, C., 1988. *Arms Transfers and Dependence*, New York, Philadelphia, Washington, DC, London: UN Institute for Disarmament Research (UNIDIR) and Taylor & Francis.
- ◆ Charpak, G. & Garwin, R.L., *Feux follets ET champignons nucléaires* (Will-o'-the-Wisp and Nuclear Mushrooms). Paris: Editions Odile Jacob.

- ◆ Cowen Karp, R., ed., 1991, *Security with Nuclear Weapons? Different Perspectives on National Security*, Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Dahlitz, J., 1983. *Nuclear Arms Control with Effective International Agreements*. Melbourne: McPhee Gribble Publishers.
- ◆ Davidov, V.F., 1980. *Nerasprostranenie Yadernogo Oruzhiya I Politika S. Sh. A.* (Non-Proliferation of Nuclear Weapons and US Policy). Moscow: Izdatelstvo Nauka.
- ◆ Dhanapala, J., ed., 1993. *Regional Approaches to Disarmament: Security and Stability*. Aldershot, Brookfield USA, Hong Kong, Singapore, Sydney: UN Institute for Disarmament Research (UNIDIR) and Dartmouth.
- ◆ Eisenbart, C. & Daase, C., eds., 2000. *Nuklearwaffenfreie Zonen: Neue Aktualität eines alten Konzeptes* (Nuclear-Weapon-Free Zones: The Topicality of an Old Concept). Heidelberg: FEST.
- ◆ Epstein, W., 1976. *The Last Chance, Nuclear Proliferation and Arms Control*. New York: The Free Press.
- ◆ Etzioni, A., 1962. *The Hard Way to Peace: A New Strategy*. New York: Collier.
- ◆ Fieldhouse, R., ed., 1990. *Security at Sea: Naval Forces and Arms Control*. Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Fischer, D. & Szasz, P., 1985. *Safeguarding the Atom: A Critical Appraisal*. London, Philadelphia: Stockholm International Peace Research Institute (SIPRI) and Taylor & Francis.
- ◆ Fischer, D., 1993. *Towards 1995: The Prospects for Ending the Proliferation of Nuclear Weapons*. Aldershot, Brookfield USA, Hong Kong, Singapore, Sydney: UN Institute for Disarmament Research (UNIDIR) and Dartmouth.

- ◆ Fischer, D., 1997. *History of the International Atomic Energy Agency: The First Forty Years*. Vienna: International Atomic Energy Agency (IAEA).
- ◆ Fischer, G., 1969. *La non-prolifération des armes nucléaires* (The Non-Proliferation of Nuclear Weapons). Paris: Pichon ET Durant-Augias.
- ◆ Fry, M., Keatinge, N.P. & Rotblat, J., eds., 1990. *Nuclear Non-Proliferation and the Non-Proliferation Treaty*. Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong: Springer-Verlag.
- ◆ Gasparini Alves, P., 1991, *Prevention of an Arms Race in Outer Space: A Guide to the Discussions in the Conference on Disarmament*. New York : United Nations.
- ◆ Gasteyger, C., 1985. *Searching for World Security : Understanding Global Armament and Dismament*. London: Frances Pinter.
- ◆ Geissler, E., ed., 1986. *Biological and Toxin Weapons Today*. Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Ghebali, V-Y., 1989. *Confidence-Building Measures within the CSCE Process: Paragraph-by-Paragraph Analysis of the Helsinki and Stockholm Regimes*, New York: United Nations.
- ◆ Ghebali, V-Y., 2000. *L'OSCE dans l'Europe Post-Communiste, 1990-1996: Vers une identité paneuropéenne de sécurité* (The OSCE in Post-Communist Europe, 1990-1996: Towards a Pan-European Security Identity). Brussels: Etablissements Emile Bruyant.
- ◆ Gjelstad, J. & Njolstad, O., eds., 1996. *Nuclear Rivalry and International Order*. Oslo, London: International Peace Research Institute, Oslo (PRIO) and SAGE Publications.
- ◆ Glasstone, S. & Dolan, P.J., eds., 1977. *The Effects of Nuclear Weapons*. Washington DC: US Department of Defence and US Department of Energy.

- ◆ Goldblat, J., 1971. *CB Disarmament Negotiations 1920-1970*. Stockholm International Peace Research Institute (SIPRI) and Almqvist & Wiksell.
- ◆ Goldblat, J. & Vinas, A., 1985. *La no proliferacion de armas nucleares* (The Non-proliferation of Nuclear Weapons). Madrid: Fundacion de Estudios sobre La Paz y las Relaciones Internacionales (FEPRI).
- ◆ Goldblat, J. & Cox, D., eds., 1988. *Nuclear Weapon Tests: Prohibition or Limitation?* Stockholm, Ottawa, Oxford: Stockholm International Peace Research Institute (SIPRI), Canadian Institute for International Peace and Security (CIIPS) and Oxford University Press.
- ◆ Goldblat, J., 1990. *Twenty Years of the Non-Proliferation Treaty: Implementation and Prospects*. Oslo: International Peace Research Institute, Oslo (PRIO).
- ◆ Goldblat, J., 1992. *The Non-Proliferation Treaty: How to Remove the Residual Threats?* New York: United Nations.
- ◆ Goldblat, J., ed., 1992. *Maritime Security: The Building of Confidence*. New York: United Nations.
- ◆ Goldblat, J., 1994. *Arms Control: A Guide to Negotiations and Agreements*. London, Thousand Oaks, New Delhi: SAGE Publications.
- ◆ Goldblat, J., 1997. *The Nuclear Non-Proliferation Regime: Assessment and Prospects*. The Hague/Boston/London: Martinus Nijhoff.
- ◆ Goldblat, J., 2000. *Nuclear Disarmament: Obstacles to Banishing the Bomb*. London and New York: I.B. Tauris.
- ◆ Goldschmidt, B., 1980. *Le complex atomique* (The Atomic Complex). Paris: Fayard.
- ◆ Graduate Institute of International Studies (Geneva), 2001. *Small Arms Survey 2001: Profiling the Problem*. Oxford: Oxford University Press.

- ◆ Grin, J. & Graaf, H.V.D., eds., 1990. *Unconventional Approaches to Conventional Arms Control Verification: An Exploratory Assessment*. Amsterdam: VU University Press.
- ◆ Haar, B., ter, 1991. *The Future of Biological Weapons*. New York, London: Praeger.
- ◆ Hemel-Green, M. 1990. *The South Pacific Nuclear Free Zone Treaty: A Critical Assessment*. Canberra: Australian National University.
- ◆ Herby, P., 1992. *The Chemical Weapons Convention and Arms Control in the Middle East*. Oslo: International Peace Research Institute, Oslo (PRIO).
- ◆ Independent Commission on Disarmament and Security Issues, 1982. *Common Security: A Blueprint for Survival*. New York: Simon & Schuster.
- ◆ Jacobson, H. & Stein, E., 1966. *Diplomats, Scientists and Politicians: The United States and the Nuclear Test Ban Negotiations*. Ann Arbor, Michigan: University of Michigan Press.
- ◆ Jasani, B., ed., 1987. *Space Weapons and International Security*. Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Jesani, B., ed., 1991. *Peaceful and Non-Peaceful Uses of Outer Space: Problems of Definition for the Prevention of an Arms Race*. New York, Philadelphia, Washington, DC, London: UN Institute for Disarmament Research (UNIDIR) and Taylor & Francis.
- ◆ Joyce, J.A., 1980. *The War Machine: The Case against the Arms Race*. London, Melbourne, New York: Quartet Books.
- ◆ Kalinowski, M.B., ed., 2000. *Global Elimination of Nuclear Weapons*. Baden-Badel: Nomos.

- ◆ Kalshoven, F., 1973. *The Law of Warfare, a Summary of Its Recent History and Trends in Development*. Leiden, Geneva: Sijthoff and Henry Dunant Institute.
- ◆ Karem, M., 1988. *A Nuclear Weapon Free Zone in the Middle East: Problems and Prospects*. New York: Greenwood Press.
- ◆ Karp, A., 1996. *Ballistic Missile Proliferation: The Politics and Technics*. Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Khan, S.A., 1990. *Non-Proliferation in a Disarming World: Prospects for the 1990s*. Geneva: Bellerive Foundation.
- ◆ Klein, J., 1964. *L'Entreprise du desarmement depuis 1945 (The Business of Disarmament since 1945)*. Paris: Editions Cujas.
- ◆ Klein, J., 1987. *Securite ET desarmement on Europe (Security and Disarmament in Europe)*. Paris: Institut francais des relations internalales (IFRI).
- ◆ Kokoski, R., 1995. *Technology and the Proliferation of Nuclear Weapons*. Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Krass, A.S., 1985. *Verification: How Much Is Enough?* London, Philadelphia: Stockholm International Peace Research Institute (SIPRI) and Taylor & Francis.
- ◆ Lachs, M., 1972. *The Law of Outer Space, an Experience in Contemporary Law-making*. Leiden: Sijthoff.
- ◆ Leventhal, P & Alexander, Y., 1987. *Preventing Nuclear Terrorism*. Lexington, Massachusetts: Lexington Books.
- ◆ Lifton, R. & Falk, R., 1982. *Indefensible Weapons: The Political and Psychological Case against Nuclearism*. New York: Basic Books.

- ◆ Lodgaard, S., ed., 1990. *Naval Arms Control*. Oslo, London, Newbury Park, New Delhi: International Peace Research Institute, Oslo (PRIO) and SAGE Publications.
- ◆ Lodgaard, S., & Thee, M., eds., 1983. *Nuclear Disengagement in Europe*. London, New York: Stockholm International Peace Research Institute (SIPRI) and Taylor & Francis.
- ◆ Lumsden, M., 1978. *Anti-Personnel Weapons*. London: Stockholm International Peace Research Institute (SIPRI) and Taylor & Francis.
- ◆ Marks, A.W., ed., 1975. *NPT: Paradoxes and Problems*. Washington, DC: Arms Control Association and Carnegie Endowment for International Peace.
- ◆ McPhee, J., 1974. *The Curve of Binding Energy*. New York: Farrar, Straus and Girous.
- ◆ Melman, S., ed., 1958. *Inspection for Disarmament*. New York: Columbia University Press.
- ◆ Moch, J., 1969. *Destin de la paix (The Future of Peace)*. Paris: Mercure de France.
- ◆ Muller, H., ed., 1989. *A Survey of European Nuclear Policy, 1985-87*. London: Macmillan.
- ◆ Myrdal, A., 1976. *The Game of Disarmament*. New York: Pantheon.
- ◆ Nethouse, J., 1973. *Gold Dawn. The Story of SALT*. New York: Holt, Rinehart and Winston.
- ◆ Noel-Baker, P., 1958. *The Arms Race, a Programme for World Disarmament*. London: John Calder.

- ◆ Norwegian Ministry of Foreign Affairs, 1992. *Towards a Comprehensive Test Ban Treaty: Expert Study on Questions Related to a Comprehensive Test Ban Treaty*. Oslo: Utenriksdepartementet.
- ◆ Patrovski, V.F., 1982. *Rezoružhenie: kontsepsii, problemy, mekhanism* (Disarmament: Concepts, Problems and Mechanisms), Moscow: Politizdat.
- ◆ Potter, W.C. ed., 1990. *International Nuclear Trade and Nonproliferation: The Challenge of the Emerging Suppliers*, Lexington, Massachusetts/ Toronto: Lexington Books.
- ◆ Prawitz, J., 1995. *From Nuclear Option to Non-Nuclear Promotion: The Sweden Case*. Stockholm: Utrikespolitiska Institutet.
- ◆ Primicerio, M., ed., 1995. *Controllo o Disordine: Il Futuro Della Proliferazione Nucleare* (In Control or out of Control: The Future of Nuclear Proliferation), Millan: Franco Angeli.
- ◆ Prokosch, E., 1995. *The Technology of Killing: A Military and Political History of Antipersonnel Weapons*. London & New Jersey: ZED BOOKS.
- ◆ Roberts, A. & Guelff, R., eds., 1989. *Documents on the Laws of War*. Oxford: Clarendon Press.
- ◆ Roberts, S. & Williams, J., 1995. *After the Guns Fall Silent: The Enduring Legacy of Landmines*. Washington, DC: Vietnam Veterans of America Foundation.
- ◆ Robinson, J.P., 1971. *The Rise of CB Weapons*. Stockholm: Stockholm International Peace Research Institute (SIPRI) and Almqvist & Wiksell.
- ◆ Robles, A.G., 1967. *El Tratado de Tlatelolco, Genesis, Alcancey Propósitos de la Proscripción de las Armas Nucleares en la América Latina* (The Treaty of Tlatelolco: Origin, Scope and Purposes of the Ban on Nuclear Weapons in Latin America). Mexico, DF: El Colegio de Mexico.

- ◆ Robles, A.G., 1979, *La Asamblea General Del Desarme (The General Assembly on Disarmament)*. Mexico, DF: Editorial de el Colegio Nacional.
- ◆ Roling, B.V.A. & Sukovic, O., 1976. *The Law of War and Dubious Weapons*. Stockholm: Stockholm International Peace Research Institute (SIPRI) and Almqvist & Wiksell.
- ◆ Roskill, S., 1968. *Naval Policy between the Wars*. New York: Walker & Company.
- ◆ Rotblat, J., 1981. *Nuclear Radiation in Warfare*. London: Stockholm International Peace Research Institute (SIPRI) and Taylor and Francis.
- ◆ Rotblat, J., 1998. *Nuclear Weapons : The Road to Zero*. Boulder, Colorado: Westview Press.
- ◆ Rotblat, J., Steinberger, J & Udgaonkar, B., eds., 1993. *A Nuclear-Weapon-Free World: Desirable? Feasible?* Boulder, San Francisco, Oxford: Westview Press.
- ◆ Rotfeld, A.D. & Stutzle, W., eds., 1991. *Germany and Europe in Transition*. Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Sanders, B., 1975. *Safeguards against Nuclear Proliferation*. Cambridge, Massachussets, London, Stockholm: Stockholm International Peace Research Institute (SIPRI), the MIT Press and Almqvist & Wiksell.
- ◆ Schindler, D. & Toman, J., eds. 1988. *The Laws of Armed Conflicts: A Collection of Conventions, Resolutions and Other Documents*, Dordrecht, Geneva: Martinus Nijhoff Publishers and Henry Dunant Institute.
- ◆ Schoettle, E.C.B., 1979. *Postures for Non-Proliferation: Arms Limitation and Security Policies to Minimize Nuclear Proliferation*. London: Stockholm International Peace Research Institute (SIPRI) and Taylor & Francis.
- ◆ Scott, G., 1973. *The Rise and fall of the League of Nations*. London: Hutchinson.

- ◆ Shaker, M.I., 1980. *The Nuclear Non-Proliferation Treaty: Origin and Implementation 1959-1979*, London/New York: Oceana.
- ◆ Sharp, J.M.O., ed., 1990. *Europe after an American Withdrawal; Economic and Military Issues*. Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.
- ◆ Shohno, N. 1986. *The Legacy of Hiroshima: It's Past, Our Future*. Tokyo: Kosei Publishing Co.
- ◆ Simpson, J., ed., 1987. *Nuclear Non-Proliferation: An Agenda for the 1990s*. Cambridge, New York, New Rochelle, Melbourne, Sydney: Cambridge University Press.
- ◆ Sims, N.A., 1988. *The Diplomacy of Biological Disarmament: Vicissitudes of a Treaty in Force, 1975-85*. London: Macmillan and London School of Economics and Political Science.
- ◆ SIPRI Yearbooks. *Armaments, Disarmament and International Security*. Stockholm, London, Oxford: Stockholm International Peace Research Institute (SIPRI), Almqvist & Wiksell, Taylor & Francis and Oxford University Press.
- ◆ Slack, M. & Chestnutt, H., 1990. *Open Skies: Technical, Organizational, Operational, Legal and Political Aspects*. Toronto: York University.
- ◆ Spector, L.S., 1988. *The Undeclared Bomb*. Cambridge, Massachusetts: Ballinger.
- ◆ Spector, L.S. & Smith, J.R., 1990. *Nuclear Ambitions. The Spread of Nuclear Weapons 1989-1990*. Boulder, San Francisco, Oxford: Westview Press.
- ◆ Stutzle, W., Jasani, B. & Cowen, R., eds., 1987. *The ABM Treaty: To Defend or Nor to Defent?* New York: Oxford: Stockholm International Peace Research Institute (SIPRI) and Oxford University Press.

- ◆ Sur, S., 1988. *Verification Problems of the Washington Treaty on the Elimination of Intermediate-Range Missiles*. New York: United Nations.
- ◆ Sur, S., ed., 1991. *Verification of Current Disarmament and Arms Limitation Agreements: Ways, Means and Practices*. Aldershot, Brookfield USA, Hong Kong, Singapore, Sydney: UN Institute for Disarmaments Research (UNIDIR) and Dartmouth College.
- ◆ Sur, S., ed. 1992. *Verification of Disarmament or Limitation of Armaments: Instruments, Negotiations, Proposals*. New York: United Nations.
- ◆ Tanner, F., ed., 1992. *From Versailles to Baghdad: Post-War Armament Control of Defeated States*. New York: United Nations.
- ◆ Thee, M., 1986. *Military Technology, Military Strategy and the Arms Race*. London, New York: Croom Helm and St. Martins Press.
- ◆ Timerbayev, R.M., 1983 *Kontrol za organicheniem vooruzheniy I razoruzheniem* (Verification of Arms Limitation and Disarmament), Moscow: Mezhdunarodnye Otnoshenia.
- ◆ Timerbayev, R.M., 1999. *Rossiya I Yadernoye Nerasprostraneniye, 1945-1968* (Russia and Nuclear Non-Proliferation, 1945-1968), Moscow: Nauka.
- ◆ Towpik, A., 1970. *Bezpieczenstwo Miedzynarodowe a Rozbrojenie* (International Security and Disarmament). Warsaw: Polski Instytut Spraw Miedzynarodowych.
- ◆ UNITAR (UN Institute for Training and Research), 1987. *The United Nations and the Maintenance of International Peace and Security*, Dordrecht/Boston/Lancaster: Martinus Nijhoff.
- ◆ Verification Yearbooks. London: Verification, Research, Training and Information Centre (VERTIC).

- ◆ Sur, S., 1988. *Verification Problems of the Washington Treaty on the Elimination of Intermediate-Range Missiles*. New York: United Nations.
- ◆ Sur, S., ed., 1991. *Verification of Current Disarmament and Arms Limitation Agreements: Ways, Means and Practices*. Aldershot, Brookfield USA, Hong Kong, Singapore, Sydney: UN Institute for Disarmaments Research (UNIDIR) and Dartmouth College.
- ◆ Sur, S., ed. 1992. *Verification of Disarmament or Limitation of Armaments: Instruments, Negotiations, Proposals*. New York: United Nations.
- ◆ Tanner, F., ed., 1992. *From Versailles to Baghdad: Post-War Armament Control of Defeated States*. New York: United Nations.
- ◆ Thee, M., 1986. *Military Technology, Military Strategy and the Arms Race*. London, New York: Croom Helm and St. Martins Press.
- ◆ Timerbayev, R.M., 1983 *Kontrol za organicheniem vooruzheniy I razoruzcheniem* (Verification of Arms Limitation and Disarmament), Moscow: Mezhdunarodnye Otnoshenia.
- ◆ Timerbayev, R.M., 1999. *Rossiya I Yadernoye Nerasprostraneniye, 1945-1968* (Russia and Nuclear Non-Proliferation, 1945-1968), Moscow: Nauka.
- ◆ Towpik, A., 1970. *Bezpieczenstwo Miedzynarodowe a Rozbrojenie* (International Security and Disarmament). Warsaw: Polski Instytut Spraw Miedzynarodowych.
- ◆ UNITAR (UN Institute for Training and Research), 1987. *The United Nations and the Maintenance of International Peace and Security*, Dordrecht/Boston/Lancaster: Martinus Nijhoff.
- ◆ Verification Yearbooks. London: Verification, Research, Training and Information Centre (VERTIC).

- ◆ Veuthey, M., 1983, *Guerilla ET Droit Humanitaire* (Guerrilla and Humanitarian Law). Geneva: Le Comte Internal de la Croix Rouge.
- ◆ Wedar, C., Intriligator, M. & Vares, P., 1992. *Implication of the Dissolution of the Soviet Union for Accidental/Inadvertent Use of Weapons of Mass Destruction*. Tallinn: A/S. MULTIPRESS.
- ◆ Westing, A.J., ed., 1984. *Environmental Warfare: A Technical, legal and policy appraisal*. London, Philadelphia: Stockholm International Peace Research Institute (SIPRI) and Taylor & Francis.
- ◆ Westing, A.H., ed., 1984. *Herbicides in War: The Long-term Ecological and Human Consequences*. London, Philadelphia: Stockholm International Peace Research Institute (SIPRI) and Taylor & Francis.
- ◆ Westing, A.H., ed., 1985. *Explosive Remnants of War: Mitigating the Environmental Effects*. London, Philadelphia: Stockholm International Peace Research Institute (SIPRI), UN Environment Programme (UNEP) and Taylor & Francis.
- ◆ Westing, A.H., ed., 1990. *Environmental Hazards of War: Releasing Dangerous Forces in an Industrialized World*. Oslo, London, Newbury Park, New Delhi: International Peace Research Institute, Oslo (PRIO), UN Environment Programme (UNEP) and SAGE Publications.
- ◆ Willot, A., 1964, *Le desarmement general ET complet. Une approche* (An Approach to General and Complete Disarmament) Brussels: Editions de l'institut de sociologie, Universite Libre.
- ◆ Winkler, T., 1981. *Kernenergie and Aussenpolitik* (Nuclear Energy and Foreign Policy). Berlin: Berlin Verlag.
- ◆ Wright, M., 1964. *Disarm and verify: An Explanation of the Central Difficulties and of National Policies*, London: Chatto and? Windus.

- ◆ York, H.F., 1971. *Race to Oblivion: A Participant's View of the Arms Race*. New York: Simon & Schuster.
- ◆ York, H.F., 1987. *Making Weapons, Talking Peace: A Physicist's Odyssey from Hiroshima to Geneva*. New York: Basic Books.

