CHAPTER 1
INTRODUCTION

Bible says, God created man to inherit this earth and live in peace. Right from the day of creation, man has made many discoveries and inventions which has transformed his lifestyle forever. Eventhougli life has become more secure, comfort and easy, still the human behaviour is conditioned largely by animal reflexes because of the hostile environment, he lives in.

Research works previously done have revealed that the root cause of hostility is the growth in population. As a result of increase in population, human settlements developed here and there and expanded as opportunities became available for family life. Institutions of government then came into being but no government was able to increase the growth of resources faster than the population growth. They were left with no other option, than to expand their territory in search of additional resources. This process of expansion sooner or later brought settled societies into conflict with one another, and war came to be accepted as a means of settling disputes.

The history of human conflict in the past clearly shows that wars were waged either for material gain in the form of living space or resources. In other words, the increase in population resulted in paucity of resources which ultimately ended up in war. In many instances, it was the wealthy and strong nation that had decided on aggression. They did so, to improve their living standards by capturing more territory after assuring themselves of military superiority over the intended victims. The primitive Hebraic prescription of "an eye for an eye and a tooth for a tooth" still inspires the modern doctrine of instant retaliation with equal, if not superior force. Rules of conduct became
the first casualty in war and the side with greater resources and superior weapons always triumphed.

**GENESIS OF THE NUCLEAR AGE**

Ever since man learnt to use his hands, the making of weapons has been his first passion. Along with the growth of science and technology, man's ingenuity to control the nuclear chain reaction led to the beginning of the so-called "Nuclear - Age".

The invention of nuclear weapons was not unexpected, since scientists have been working on it for quite a long time. Till 1930, the idea of mass destruction were known to be within the bounds of theory but after world war-II, military interest in this new field of atomic science was indifferent.

In December 1938, Otta Hahn and Fritz Strassman carried out experiments in the University of Berlin, to prove that Uranium atom would split when bombarded with neutrons. In 1939, the experiments conducted by Professor. Fredric Joliot and Curie in France revealed that the actual splitting of the Uranium released more than one neutron.\(^1\) This was the discovery that scientists had been anticipating for a very long time, for it would cause a nuclear chain reaction of an explosive character which could be used either for peaceful or military purpose. Once the secret of atomic power had been revealed, research institutions from various parts of the world began to compete with one another to find out its practical applications. Thus the physicists came into prominence during the second world war, as the chemists had done in the first world war.

Even after the invention of the atom bomb, many scientists were morally against the use of it, as it would wipe away the lives of thousands of people instantaneously, apart from the extensive radioactive fallout, about which there was no awareness during those days. Some scientists preferred the atom bombs to be tested in some uninhabited areas and seeing the results after demonstration, they were quite convinced that atom bombs could prove to be powerful weapons, if used for military purpose. This idea of using atom bombs in war was first put into action by the then American President, Truman, who used them against Japan because he believed that it would shorten the war and thus save American lives. The Japanese had almost lost the war and would have surrendered sooner or later, but the US wanted to test its new discovery of destructive power and the test resulted in some 1,20,000 killed and many lakhs wounded, besides the destruction of many houses and properties worth billions of dollars.²

The two bombs dropped by America on Japan brought about instantaneous devastation on the two cities. The damage inflicted was so severe and extensive that even today the full story is unclear and the effects of that damage have also extended over the years. Due to the radiation fallout, survivors suffered and experienced both physical and mental pain which they had never known before and thus they understood, that never should such a thing happen anywhere in the world in future. To that end they have, from that day to this, consistently appealed for the total abolition of nuclear arms thereby realising true and permanent world peace.

The development of technology has been used to destroy in a few minutes, entire cities in another continent. Thus elimination of humans in millions from great distances has now become a matter so simple and easy and in the event of nuclear war, killings in millions is accepted as an end result.

The primary data collected from the intellectuals through questionnaires is interpreted below.

**Is Nuclear War a Real Victory?**

<table>
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<tr>
<th>S.No.</th>
<th>Response</th>
<th>No. Responded</th>
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<tr>
<td>1.</td>
<td>Yes</td>
<td>2</td>
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<td>2.</td>
<td>No</td>
<td>48</td>
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<td>Total</td>
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**Table - 1.1**

When asked whether any nation can win a nuclear war, about 96% of them responded that it cannot be won and only the remaining 4% have said, it can be won. This shows that almost everyone have the opinion that no nation can ever win a nuclear war. Even a powerful nation won’t dare to fight a nuclear war because it cannot accept losing thousands of lives or its main cities being destroyed. When compared to the nuclear bombs dropped by US on the Japanese cities during world war II, the nuclear weapons possessed by the nuclear weapon powers today are hundred times powerful and they also possess highly sophisticated delivery systems. In this condition, if a war is fought between two nuclear weapon powers, there will be huge and unbearable destruction on both sides. This reveals that a nuclear war is neither fightable nor winnable.
HOLOCAUST OF NUCLEAR WAR

Fig.1.1 A few Hours after "Little Boy" was dropped on Hiroshima on August 6, 1945

Fig.1.2 A view of what was Hiroshima's main Business and industrial centre, shortly after the bomb was dropped.
Even five decades after the explosion of atomic bombs in Hiroshima and Nagasaki, still the effect can be seen affecting the health of the people for many generations. For instance, in these areas it was found that some people had developed cataract because of the presence of radioactive elements in their genes. "Leukemia was first found in the exposed, in 1945 at Nagasaki and in 1946, at Hiroshima." The incidence of Leukemia among the exposed became higher in the following years and reached its peak between 1950 and 1953. A few years later, there was an increase in the number of cancer victims among the people who had been exposed to the atomic bomb.

The fate of all survivors is to live with the fear that the atomic bomb has brought upon them and the effect of the atomic bomb and its radiation fallout was only little known to the outside world. But today things have entirely changed and the world is well aware of its lethal effects.

A. THE BLAST EFFECT

About half of the total energy released in the explosion of a nuclear weapon is contained in the blast wave, which produces very high pressures in the air through which it passes. This high intensity wave can bring death either directly or indirectly. The human body has the capacity to withstand intense pressures and most of the deaths occur from indirect effects, from the collapse of buildings and falling debris. Taking into consideration the wars of the past, we can capture an idea of what could be the effect of the blast wave on human beings. Even if the bombs fail to give the anticipated yield, there can be no doubt that a large bomb detonated over a centre of population would kill a mass of life.

In addition to deaths there would be many injuries, abrasions, fractures, ruptured internal organs and loss of blood. Many wounds which could recover in normal circumstances with medical care would not do so, if caused by a nuclear explosion because of the burns and radiation exposure. Thus the chances of recovery would be greatly diminished, largely because medical help would be hampered by fallout.

B. OZONE DEPLETION

The ozone layer in the stratosphere plays an important role, in shielding the earth from ultraviolet radiation from the sun. During nuclear explosions the nitrous oxide released reaches the high atmosphere where they react with ozone, eventually converting ozone into oxygen molecules. The large fire which follows nuclear explosions and the complex reactions caused by multiple explosions might cause some of the smoke to rise higher. Studies on nuclear explosions suggest that, individual smoke plumes might reach as high as 20km, well into the stratosphere.

A nuclear war could cause great damage to the ozone layer, allowing penetration of ultraviolet radiation to the earth surface. So long as dust and smoke clouds persisted, they would absorb most of this deadly radiation. However, since the ozone layer would be re-established only slowly, the earth’s surface would be exposed to the damaging radiation for some years. This would raise the level of ultraviolet radiation on earth’s surface to twice the ordinary level.

C. THE HEAT EFFECT

The effect of heat wave is less predictable than the blast wave. In the explosion of nuclear weapons, the heat released is of very high temperature and this makes it
difficult to estimate casualties. About one third of the total energy released in the explosion appears in the form of heat. The massive release of heat energy can cause fatal or severe burns and set fire over a large area. The distance covered by the heat wave depends primarily on the explosive yield of the bomb. The heat wave can cause fatal casualties at distances much greater than, from the blast wave. But even those indoors may become causalities of the heat effect, because it causes death and injury through the fire started by the ignition of flammable and combustible materials.

D. RADIATION FALLOUT AND TOXIC GASES

The radioactive fallout following a nuclear explosion would contaminate millions of square kilometers of land with lethal radioactivity. In a nuclear war, electricity-generating power stations are likely to be primary targets. Should a nuclear power station be hit by a nuclear bomb, the radioactive content of the reactor would be sucked up with the fireball, carried by the wind and deposited as local fallout together with the fission products of the bomb. The affected area would be contaminated for a much longer time because the decay of the radioactivity from a reactor is much slower than that from a bomb.4

It is a well known fact that people who die in fire accidents have been poisoned by toxic gases. In addition to carbon monoxide, hydrogen cyanide and hydrogen chloride are generated when the synthetic compounds in modern building materials burn. So in a nuclear conflict the possibility of vast areas being contaminated cannot be ruled out.

THE END OF COLD WAR

The arms race began after world war-II, as the stronger nations took efforts to consolidate their respective positions in the territories under their military occupation. There was also a four year gap in the nuclear arms race between the USA. and USS.R and that itself acted as a spur to the latter to catch up with the former, and to the former to maintain, if not improve its leading position. Following these developments both USA. and USS.R. took steps to rehabilitate war devastated economies. USA. reduced its forces by 87 percent, from 12 million to 1.5 million while USS.R. cutdown its military strength by 75 percent. The superpowers compensated the reduction in military strength by investing in developing the effectiveness and destructiveness of nuclear weapons, a few hundred of which were enough to produce the total explosive potential of the millions of conventional bombs used in the second world war.

International security has undergone notable changes in the recent years and the year 1991-92; witnessed some dramatic events. One of the two superpowers, the USS.R., in its efforts to transform itself into a sovereign nuclear weapon state, disintegrated into fifteen states. Thus the cold war and nuclear arms race between the two superpowers victimized USS.R. and it radically altered the global alignment patterns and power equations, thereby creating a new strategic environment throughout the world. The collapse of the Soviet Union marked a victory for the United States led capitalist world. The Gulf war demonstrated the sole supremacy of the United States giving an impression of a unipolar world. In the years following the disintegration of the USS.R., the United States has used its strategic superiority to achieve its economic ends and protect its allies, keep its ambition for global predominance and self-assumed role of global policymanship to be alive.
The emergence of USA, as the sole superpower has boosted its confidence which will shape and determine the world order at least for the near future. Even now, in developing the new generation of nuclear weapons and space based weaponry, the US is ahead of the rest of the world.

**PROLIFERATION OF NUCLEAR WEAPONS**

The nuclear weapons limitless power of destruction requires a substantially new manner of preserving peace and settling disputes, if mankind is to survive. For now the means of war threaten the ends of war. Nuclear weapons are primarily for the security of the nation and promises guarantee of protection against adversaries acting to inflict war in any form. Nuclear weapons are solely means to deter war, not to fight it.

In a hostile environment, a country which is surrounded by potential adversaries, will have no choice but to develop an effective deterrent. If the threat is nuclear, the response will also have to be nuclear. To ignore the nuclear factor in all its dimensions will be utter negligence. Security, will therefore be the first compelling reason for a country to go nuclear while Prestige is the other factor. Chinese recognition by the USA and her entry into the UN Security Council as a permanent member was because of her having acquired a nuclear status.

In examining the reasons that might lead a given country to decide to develop a nuclear weapon capability, underlying pressures behind such a decision should be distinguished from the events that trigger off the actual decision. The belief that acquisition of even a rudimentary nuclear capability, would allow a country to deter a
nuclear rival has been and will continue to be an important security related reason, for going nuclear.

The decision to acquire nuclear weapons could be motivated by efforts to strengthen domestic morale. For example, the timing of some of China’s nuclear explosions, appears to have been chosen partly to influence domestic morale. The diversion of domestic attention from internal problems could be another motivating factor. Pakistan’s recent announcements could be traced to this end.

Whatever may be the motivating factor for a nation to undergo nuclearisation, it is a well known fact that nuclear proliferation is going on in a very rapid pace. With the dramatic changes in the world environment, triggered by the end of cold war and the disintegration of the Soviet Union, attention has come to be focussed on the so-called silent spread of nuclear weapons in many parts of the world.

PROBLEM OF NUCLEAR PROLIFERATION

Progressive increase in nuclear capability and production of more sophisticated weapon systems by nuclear weapon powers, has increased the danger of total destruction of the world.

The basic responsibility for nuclear weapon proliferation must be shared by the nuclear weapon states. What started as a competition between USA and USSR has now engulfed the entire world. In fact, the NPT is also to be blamed for nuclear proliferation. Under the protection of NPT, the nuclear weapon states continued with their nuclear weapon programme. The definition of nuclear proliferation as included in the NPT, refers only to non-nuclear states acquiring nuclear technology or nuclear weapons. The nuclear
weapon states are left free, even to acquire and develop the weapon technology including increasing their own stockpiles. The aspirants of nuclear technology are denied the facility, even if they wish to acquire it for peaceful purposes.

Nuclear proliferation has occurred mainly because the nuclear powers are themselves supplying the nuclear technology in a clandestine manner to nations which are ready to buy it. But the nuclear weapon states claim that in larger interest of peace and need of maintenance of balance of power, transfer of such technology may have to be accepted. In the process, the nuclear weapon states ignore the vertical or horizontal proliferation which take place as a bi-product of such transactions.

CLANDESTINE NUCLEAR TRANSACTIONS

Trade in nuclear materials like equipment and technology has increased rapidly. The transaction of nuclear technology or nuclear material (Plutonium) from a nuclear weapon state to a developing nation is likely to be controlled by an international agency or may only be partially controlled by the donor country. The possibility of transfer of plutonium, therefore, poses a serious threat to balance of power in any region. Moreover, plutonium can also be produced in research reactors and in special reprocessing plants, specially designed for plutonium production. Over 50 clandestine reactors with stolen technology and nuclear fuel obtained through 'black market' are believed to be functional in a number of countries. Pakistan, Saudi Arabia, Libya and Israel are some of the countries involved in getting nuclear weapons and technology in this manner.

It is because of such clandestine transactions, the nuclear technologies including those dealing with breeders, reprocessing plants and enrichment facilities have all come
under the purview of current definition of proliferation. In the same content it must be noted that nuclear proliferation is not possible unless the nuclear weapon states deliberately or by design supply nuclear technology, fuel and facilities to those countries who may use it for attaining weapon status instead of using it for peaceful purposes.

NUCLEAR PROLIFERATION IN THIRD WORLD COUNTRIES AND MAJOR POWERS

After a large number of nations signing the NPT, it was generally believed that the nuclear proliferation will considerably be controlled and reduced. However the NPT divided the world into nuclear ‘haves’ and ‘have nots’. The countries of the third world belonging to ‘have nots’, inspite of signing the NPT, were denied the benefits of NPT for one reason or the other. The problem in the third world countries also need to be considered in relation to their internal and external policy perceptions. Broadly speaking, the third world is still looking out for benefits of nuclear technology to improve their security and living standards. Many third world countries are emphasising the supply of nuclear facilities for the purpose of civilian use.

Rules and regulations are very biased in favour of the major powers. The major nuclear powers have not taken any real efforts to reduce their nuclear arsenals. Refinements introduced into weapons by one side have quickly been matched by the other. Even while transferring satellite technology to other nations the major powers have ignored vertical proliferation. Eventhough many treaties have been made in the past, not one was able to limit the arms race between the nuclear powers.
While silent proliferation continued at one end, efforts were also made towards dismantling, controlling and inhibiting further proliferation.

NON-PROLIFERATION EFFORTS

The first atomic weapons were exploded over Hiroshima and Nagasaki in August 1945, six weeks after the signing of the UN charter. In its very first resolution, arising from the initiative of the permanent members of the Security Council, the General Assembly of the United Nations unanimously decided to establish an Atomic Energy Commission which was to make specific proposals for the elimination of atomic weapons from national armaments.5

The Commission was unable to make any headway because of the difference between the super powers. After a series of discussions at the United Nations, the idea of non-proliferation was arrived at by the major powers which were developing their own nuclear weapon capabilities in the mean time. The idea of non-proliferation was very different from disarmament which in due course, led to the 1968 Treaty of non-proliferation of nuclear weapons. Despite the fact that the NPT had 139 parties as of January 1989, one should note that the non-signatories include not only two nuclear weapon powers, namely, China and France, but also several new powers. The NPT has been refused to accept by the states, where nearly 45 percent of the population resides. Even among some of the signatory states there had been serious discussions of going nuclear after 1995, if the present nuclear weapon states are allowed to retain a minimum deterrence.

In more recent years, while more than 136 member nations of the UN have voted repeatedly calling for a ban on the use and the threat to use of nuclear weapons, the resolution has been persistently opposed by the 15 NATO countries and two of their allies. This opposition shown by the NATO member countries shows that even if they may have signed the NPT, they consider nuclear weapons to be legitimate weapons. It also means that they do not take seriously the reminder in the preamble of the NPT, that in accordance with the charter of the United Nations, states must refrain in their international relations from the threat or use of force against the territorial integrity of any state. All these things failed to build confidence in the NPT regime.

The approach of the non-aligned nations, from the very beginning has been strongly against the legitimacy of nuclear weapons and the discrimination between the nuclear and non-nuclear weapon states. The second non-aligned summit at Cairo held in 1964, called upon the great powers to abstain from all policies conducive to the dissemination of nuclear weapons among states that did not possess them and at the same time to agree on measures, providing for gradual liquidation of the existing stockpiles of nuclear weapons. The conference also took a stand against the deployment of nuclear weapons on the territories of non-nuclear states as a step towards gradual liquidation of the denuclearisation process.

In 1965, India and seven other nations presented a resolution to the General Assembly of the United Nations, on a treaty to prevent the proliferation of nuclear weapons which called for negotiation of an international treaty to prevent the proliferation of nuclear weapons based on certain principles. They are:
a. There should not be any loopholes in the treaty which might permit nuclear or non-nuclear powers to proliferate directly or indirectly, nuclear weapons in any form.

b. The treaty must contain balance of mutual responsibilities of the nuclear and non-nuclear powers.

c. The treaty should be a step towards the achievement of complete disarmament.

d. There should be acceptable provisions to ensure the effectiveness of the treaty.

This resolution was passed by the General Assembly with an overwhelming majority which included UK, USA, and USSR. The NPT which emerged eventually, did not accommodate the above principles. The objective of elimination of nuclear weapons almost disappeared from the international agenda. The superpowers followed a path of mutually agreed armaments build up, rather than one of arms reduction, showing little respect for their obligations under Article VI of the NPT. And the other three nuclear powers also built up their own nuclear arsenals as they saw fit.

NON-PROLIFERATION TREATY

The devastation caused by the atomic explosions at Hiroshima and Nagasaki, induced leaders of powerful nations to device ways and means to minimise the chances of its reoccurrence. The USA and USSR, in co-operation with each other, drafted a proposed treaty for non-proliferation of nuclear weapons in 1967. On June 12, 1968, the
General Assembly endorsed the NPT. It was opened for signature on July, 1968. The treaty was immediately signed by U.K., USA and USSR and over 50 other states and the treaty came into force on March 5, 1970.

Article I and II of this treaty states that the nuclear weapon states should not transfer nuclear weapons or nuclear materials in any form. Similarly non-nuclear weapon states are to guarantee non-acquisition of these devices either directly or indirectly.

Article III provides for safe guards to be accepted by non-nuclear weapon states in accordance with the agreement to be concluded by International Atomic Energy Agency (IAEA), with a view to prevent diversion of nuclear energy from peaceful uses to nuclear weapons.

Article IV provides for understanding measures through international procedures to ensure availability of benefits from any peaceful application of nuclear explosions to non-nuclear states on non-discriminatory basis.

Article V provides for amendment and review and Article VI states that each signatory is to pursue negotiations for cessation of arms race and complete disarmament under strict and effective international control.

Article VII asserts to right of any group to equipment, materials, scientific and technological information for the peaceful uses of nuclear energy.

Article VIII provides for a majority vote for acceptance of any amendment. Also, a conference for reviewing the operation of the treaty to be held at regular intervals.

Article IX and X enumerates the procedures for seeking membership, ratification by signatory states and the method for a nation's entry to come into force. The right of the member countries to withdraw from the treaty to safeguard supreme national interests is also established.

REATIONS TO TREATY

"A treaty is ordinarily judged by two standards (i) whether it has fulfilled the high purposes of its preamble and (ii) whether its provisions have been observed. Judged by both these standards, the non-proliferation treaty has been a failure". The non-proliferation treaty of 1968 contains not just a loophole but a wide open door for proliferation of nuclear weapons by the nuclear powers. The preamble of the NPT speaks about the prevention of a destructive nuclear war. Unfortunately, the risks of nuclear war have increased many times over, as a result of the relentless vertical proliferation of nuclear weapons.

The western powers held the view that non-proliferation should be concerned with the prevention of the emergence of a large number of nuclear powers than at present because in their view, any increase in their ranks would contribute to an increase in international instability and insecurity. The non-nuclear powers on the other hand pleaded with considerable logic that non-proliferation should cover not merely the prevention of the spread of nuclear weapons to non-nuclear powers, but also the proliferation of nuclear weapons and nuclear weapon technology, as well as the continued manufacture of nuclear weapons by the existing nuclear powers. But the western nations led by the US, very

Rikhi Jaipal, Nuclear Arms and Human Race, Allied Publishers, New Delhi, 1986, p.183
clearly ignored all their commitments. Any reduction of nuclear weapons or time bound nuclear disarmament was considered by the US as unrealistic.

INDIA'S REACTION TO NPT

India came under the pressure of the western states to sign the NPT. India had initially joined in the promotion of NPT but later described it as discriminatory as it only disarms the non-nuclear weapon states, while nuclear weapon states were carrying on their vertical nuclear proliferation. Later on, when the NPT was opened for signing in 1968, India refused to sign it.

The following summarizes the main objections raised by India against NPT:

a. The NPT is a discriminatory one because the expansion of nuclear weapons by the nuclear weapon states will not be considered proliferation, while a similar activity by non-nuclear weapon states will be regarded as proliferation. The truth was that the ‘haves’ can have more and the ‘have nots’ can have nothing.

b. This treaty prohibits only horizontal proliferation and does not do anything to discourage vertical proliferation (i.e.) arms race between the nuclear weapon states.

c. Peaceful nuclear explosions are prohibited by the treaty, which the developing countries need for their speedy development.

d. The treaty does not take into account the security threat from nuclear weapon states to the non-nuclear weapon states.

Above all, the main reason why India opposed the NPT is that, under the NPT, non-nuclear states will be subjected to inspection, verification etc., by the International Atomic Energy Agency (IAEA), but there will be no such obligation on the nuclear powers. India which had developed nuclear technology indigenously without foreign collaboration, therefore rejected the NPT.⁹

The explosion of India’s first nuclear device, at Pokhran in 1974, within four years of the NPT coming into force, was considered as a protest against the arbitrary and unequal NPT because in 1974, there was no threat to India’s security, since India’s defence capabilities and reputation stood high after the 1971 Bangladesh war.

THE THRESHOLD TEST BAN TREATY

This was a bilateral treaty between USA and USSR, signed on July 3, 1974 and came into force in December, 1990. The treaty required the signatories not to carryout any underground nuclear weapon tests having yield exceeding 150 kilotons. But the treaty did not prohibit underground explosion for peaceful purposes or having yield below 150 kilotons.

PEACEFUL NUCLEAR EXPLOSION TREATY

This treaty was also made between the two superpowers USA and USSR. It was signed on May 28, 1976 but this treaty came into force only after 1990. This treaty extended the 150 kiloton limit imposed by the Threshold Test Ban Treaty, to the explosions for peaceful purposes.¹⁰

⁹ Akhtar Ali, Pakistan’s Nuclear Dilemma, ABC Publishing House, New Delhi, 1984, p.122

The Comprehensive Test Ban Treaty stressed that all the nuclear tests must be banned but it did not impose upon the powers possessing nuclear weapons, the obligation to destroy their existing stockpiles of such weapons. In other words, the CTBT did not ban the advance in sophistication of the nuclear weapons which the nuclear weapon states already possessed.

Technological advance can ensure without a test the updating of the existing arsenal of the nuclear weapon powers. In other words, CTBT cannot stop the perpetuation of imbalance on a world scale because those who have nuclear weapons, could go on improving upon them without a test and those who do not possess any nuclear weapon would have to undertake giving the pledge that they would never go in for any nuclear weapons test. This means that, the existing disparity between the powers possessing nuclear weapons and those that do not, is sought to be perpetuated through CTBT.

The centre point of CTBT is that only those who possess nuclear weapons can use it and nobody else. The major powers with huge arsenals of weapons, both conventional and nuclear, were seeking new devices for dominating the world. The CTBT is one such device by which the nuclear powers try to dominate and suppress other nations of the world which do not possess nuclear weapons.

_Muchkund Dupey, CTBT and India's Nuclear Options I and II, The Hindu, April 8, 1996_
GOAL OF CTBT NEGOTIATIONS

Firstly, it would contribute to protecting the natural environment. Only since 1980, have all nuclear weapon tests been conducted underground, mainly for environmental reasons. However, even underground tests contain a danger of contaminating the atmosphere and test sites. Reports about the atmospheric condition at nuclear test sites used by the former Soviet Union, show venting of radio activity.

Secondly, a CTBT should contribute to disarmament and non-proliferation. In principle, nuclear disarmament means freezing or reducing existing stockpiles of nuclear weapons and delivery systems. A new generation of nuclear weapons, if technically feasible, could make testing much more desirable for a designer. Hence, a prohibition of testing could stop the development of new nuclear weapons that would constitute a substantive disarmament effect and prevent an arms race.\(^\text{12}\)

In regard to non-proliferation of nuclear weapons which means preventing the further spread of nuclear weapons or horizontal proliferation, two possible scenario’s can be distinguished. An emerging nuclear state could try to keep its endeavours secret or it could decide to conduct a nuclear weapon test, accepting that it would be detected and identified in order to draw political advantages from it.

The main reason why CTBT wants to stop the emergence of new nuclear weapon states was because it would pose a serious threat to global security and to the security of the region in which it emerges. This view was confirmed by the Security Council in its

statement dated January 31, 1992, which stated that "the proliferation constitutes a threat to international peace and security".

So, in order to stop this horizontal proliferation, if an emerging nuclear-weapon state that tests a nuclear device and is detected and identified by a CTBT verification regime then it would come under considerable international political pressure which would do everything to redress the situation. It is important to note that the mere fact that an effective verification means exist, could deter a nation from nuclear testing, in the first place.

INDIA AND CTBT

In 1950s, when nuclear weapon testing was taking place above ground, India called for an end to all nuclear weapon testing as it would be the first step to put an end to the nuclear arms race. In 1954, the Indian Prime Minister, Jawaharlal Nehru, called for negotiations for prohibition and elimination of nuclear weapons and in the interim, a standstill agreement to halt nuclear testing. During that time, the world had witnessed less than 65 tests but India’s call was not responded by the international community. In 1963, after an agreement to ban atmospheric testing, countries started developing the technologies for conducting underground nuclear tests and the nuclear arms race continued.

India along with the US showed favour and concern towards the UN resolution, calling for a CTBT and an FMCT in 1993. New Delhi’s calculation was that, neither
treaty had much chance of coming to effect or would atleast take an interminably long time. This was assumed from the cold war experience with such global agreements.\(^{13}\)

India's calculation was that it would lose nothing but earn good name for upholding the moral standard on disarmament. Unfortunately, everything went against India's anticipation as the CTBT negotiations made rapid progress. It was only after this stage, India realised that the treaty had a very good chance of coming into effect and that it would mean that India should surrender its nuclear option.

Moreover, when the CTBT negotiations began in 1994, at the conference on Disarmament in Geneva, India was very hopeful that it would be directed towards the elimination of nuclear weapons in a time-bound manner. However, during the negotiations India realised that the nuclear weapon states were not willing to take the CTBT in the direction of nuclear disarmament. Therefore, when the negotiations got over in 1996, India realised that the treaty was neither comprehensive nor did it deal with the test ban. It did ban nuclear explosions but allowed high-tech forms of testing. It allowed non-explosive, sub-critical tests which gave the nuclear weapon states the right to continue tests and strengthen their nuclear arsenals. So India came to the conclusion that if it signed the CTBT, it will have to remain a non-nuclear weapon state forever.

After alerting itself in the later stage, India began to demand that the treaty should be linked to global nuclear disarmament in a time frame which should cover laboratory nuclear tests also. These demands were both politically and technically impossible. The later hour at which India raised these objections led most countries to suspect India's intentions and India was considered as a deliberate spoiler. Thus, when the CTBT was

\footnote{Amitabh Mattoo, \textit{India's Nuclear Deterrent}. Har-Anand Publications, New Delhi, 1998, p.200}
finally adopted at the U.N. on September 10, 1996. India’s Chief negotiator, Arundhati Ghosh, stated categorically that "India would never sign the unequal treaty, neither now nor later."\textsuperscript{14}

The plain fact why India opposed CTBT is that, the CTBT has become an instrument for the nuclear weapon states, to consolidate their monopoly over nuclear weapons. India holds different views on this issue. The first thing to be noted here is that CTBT is not an independent treaty. It has an integrated relationship with the NPT concluded in 1970 which created distinction between the nuclear weapon states (NWS) which have the right to improve their nuclear weapons and non-nuclear weapon states (NNWS) which do not have such rights. In effect, the NPT created a framework for the permanent domination of nuclear weapon states over the non-nuclear weapon states. This was one factor why India did not adhere to this treaty and what bothered India more was, the NPT legitimized China as a NWS and on the other hand, it sought to prevent India from becoming one. Above all these, the indefinite extension of the NPT, in May 1995, indicated that the five nuclear weapon states (ie) USA, Russia, France, Britain and China were keen to maintain their monopoly over nuclear weapons.

"When these countries met to sign the CTBT in 1996, they were already in possession of 35,000 nuclear weapons. Out of them, Russia had about 22,500 nuclear weapons, US 12,070, France 500, China 450 and Britain 380. In addition to this, these countries by 1996 had already conducted 2,047 nuclear tests - US 1032, Russia 715, France 210, Britain and China 45 each."\textsuperscript{15}

\textsuperscript{4} Dilip H. Mohite, Pokhran Vs Chhagat Hills: The nuclear dilemma for India and Pakistan, Kalanga Publications, Delhi, 2001, p.89

\textsuperscript{15} Ibid, p.91
Of these five nations, France and China continued the test right up to the signing of the CTBT. It obviously indicates that none of the nuclear weapon states had any inclination to give up their nuclear weapons.

India made it clear that if it is to sign the CTBT, then it should be recognized as a nuclear weapon state. Russia and France have fairly enough agreed to recognize India as a nuclear weapon state, but USA and China strictly opposed this. If India is not recognized as a nuclear weapon state and does not enjoy an equal status with the five nuclear weapon states then it has to bear the obligation and will not have any benefit. Further, if India signs the CTBT as a non-recognized nuclear weapon state, it will automatically come under the fold of non-proliferation regime.

FISSILE - MATERIAL CUT-OFF TREATY (FMCT)

In a US sponsored initiative, the United Nations General Assembly (UNGA) in its 1993 session, adopted a consensus resolution on the prohibition of the production of Fissile Material for nuclear weapons. The Fissile Materials i.e Highly Enriched Uranium (HEU) and Plutonium are the major ingredients for nuclear weapons. The objective of this treaty is to prohibit future production of fissile materials for use in nuclear weapons or nuclear explosive devices.

A ban on production of fissile materials, it is believed, will limit potential nuclear arsenals. The UN General Assembly has adopted several resolutions in the past for a ban on fissile materials. But different from the previous resolutions, the 1993 resolution was

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significantly distinct as its language appeared to be restrictive. It omits the conversion and transfer of stocks to peaceful uses and reversing the nuclear arms race, which was part of the previous resolutions.

The FMCT is believed to further discriminate between the nuclear ‘haves’ and ‘have nots’ because the nuclear weapon powers do not require further production of fissile materials as they already have substantial amount of fissile material. The fission materials that US and Russia have, is said to be enough to make 10,000 thermo nuclear warheads. Apart from this, the materials retrieved from the retired warheads can also be recycled and used. Therefore, any weapon modernization by the nuclear weapon states will not be affected by this treaty at any stage. The FMCT is also likely to quantitatively freeze the fissile materials of threshold states at present levels capping these countries nuclear weapon programmes. It has been estimated that India, by 1995, had a stock of 315-345 kg of plutonium. This includes approximately 250 kgs of plutonium from CIRUS which may not be used for weaponisation because India has an agreement with Canada, which forbids its use for weapons.

The above mentioned reasons clearly explains the biased nature of FMCT. Even though India had co-sponsored with the US in the UNGA resolution seeking such a treaty, India may be expected to negotiate hard to safeguard its interests. Generally speaking, India is likely to go along with a treaty text which brings future production of fissile materials for weapons purposes under international inspection and safeguards.17 However, if existing stockpiles are to be included in such a treaty, India is most likely to insist before signing such a treaty that the stockpiles (Materials and Warheads) of nuclear

Major Sulakshan Mohan, India's Nuclear Leap, Indian Publisher Distributors, New Delhi, 2000, p.218.
weapon states be reduced in a proportionate manner, leading to their ultimate elimination. In such a case, the treaty would adopt the shape of global nuclear disarmament treaty. In the interim, India is not likely to accept any limitations, on its production of fissile material for weapon purposes.

The primary data collected from the intellectuals (regarding the failure of non-proliferation efforts) through questionnaires is interpreted below.

**Failure of Non-Proliferation Efforts - ‘Reasons’**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Response</th>
<th>No. Responded</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>They are not time-bound</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>They are discriminatory</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>3.</td>
<td>They cannot achieve total disarmament</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table - 1.2**

When asked about the main reason for the failure of non-proliferation efforts to stop nuclear proliferation, about 10% of the respondents have said that it is because they were not time-bound, another 60% have said that it is because they were discriminatory and the remaining 30% have said that it is because they cannot achieve total disarmament. This reveals the fact that majority of the people feel that the nuclear non-proliferation efforts failed to stop nuclear proliferation because they were discriminatory in nature.

All the non-proliferation efforts taken were discriminatory in nature because the accumulation of nuclear weapons by the nuclear weapon states was not considered proliferation, while a similar activity by a non-nuclear weapon state was regarded as
proliferation. Moreover, the treaties that were made to halt nuclear proliferation also prohibited the developing nations from conducting peaceful nuclear explosions. All these things put together shows that the NPT and other non-proliferation efforts taken were discriminatory in nature, as it separated the world into nuclear ‘haves’ and ‘have nots’.

**Nuclear Free World - ‘Possibilities’**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Response</th>
<th>No. Responded</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Possible</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>2.</td>
<td>Impossible</td>
<td>42</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table - 1.3**

When asked about the possibilities of establishing a nuclear weapon free world, about 84% of the respondents have responded that it cannot be established and only 16% have replied that it is possible. This shows that majority of the people feel that creating a nuclear weapon free world in the near future is impossible because none of the disarmament efforts taken so far have been fruitful. The major powers have used the disarmament treaties as powerful weapons to suppress the nuclear ‘have nots’. They also believe that possession of nuclear weapons are very helpful in maintaining peace and stability all over the world. Above all these, possession of nuclear weapons are considered to be currency of power and a symbol of prestige and hence the nuclear weapon powers will never agree to destroy their nuclear weapons.

Thus it is evident that global nuclear disarmament is impossible in the near future.
GLOBAL NUCLEAR ORDER

The NPT has divided the world into four categories. The first being the group of P5 nations which control other nations of the world and have no mutual threat. Of the P5 nations US, UK and France are members of one military alliance, called the North Atlantic Treaty Organisation (NATO). Of these three, the US has considerably helped the two nations in the development of their nuclear programmes. Russia, who was their adversary has now become a partner in establishing peace, by joining the Organisation of European Security and Co-operation (OSCE). Further, all of them have detargetted their missiles from each other. China, the fifth member of this group has a mutual ‘No-first use’ understanding with Russia and has some understanding with USA in detargetting missiles on a reciprocal basis. In other words, these five nuclear weapon powers have ‘no threat’ from each other and therefore their nuclear arsenals are not directly related to their security threat perceptions.

The second category of nations are ‘allies’ of these five nuclear weapon powers because they get nuclear protection from them. Some of these nations are members of the NATO and some of them also have bilateral security treaties with United States such as South Korea, Japan, Australia and Newzealand. Other nations of Europe which are not member of NATO, are part of the Organisation of Security and Co-operation in Europe (OSCE). Thus, all industrial nations are under some kind of nuclear security framework.

The third category of nations are those, who have formed nuclear free zones and have attempted to obtain nuclear protection from the nuclear weapon powers in exchange for undertaking that they will not acquire nuclear weapons. By seeking and accepting nuclear protection guarantees, they in turn legitimise the nuclear weapons of the five
nuclear weapon powers. The fourth category of non-nuclear weapon states within the NPT, are nations which have been brought under the jurisdiction of the US central command.

There is another group of nations which have not acceded to the NPT. Two of them, India and Pakistan, have declared themselves nuclear weapon States. Israel was known to be a nuclear weapon state even at the time of finalization of the treaty (NPT) in 1968. Only Cuba remains as a non-nuclear weapon state outside the global nuclear order. Thus the reality today is that whether India, Pakistan and Israel are accepted as nuclear weapon states under the non-proliferation Treaty or not, the international community cannot overlook their weapon capabilities. The global nuclear order therefore, consists of eight nuclear weapon states and the rest under a Non-Proliferation regime. Since all the non-nuclear states other than Cuba are signatories to the NPT, there can be no more new nuclear weapon state unless the NPT is violated.

THREATS TO GLOBAL NUCLEAR ORDER

A global nuclear regime with eight nuclear weapon states cannot be unsafe or unstable than one with five nuclear weapon powers. The three nations India, Israel and Pakistan have behaved with far more restraint than the nuclear weapon powers, in the initial years of the nuclear era. Their nuclear weapons build-up has not been fierce arms race like that of acknowledged nuclear weapon powers. If, after the fierce arms race and cold war confrontation of many decades, the five nuclear weapon powers can agree to give up their rivalries, detarget their missiles and reduce their conventional forces, then why will this not work out with the additional three nuclear powers. Since the nuclear weapon powers have come to the conclusion that a nuclear war was not fightable and
winnable and mutual deterrence would preserve peace among them, there is all the reason, for the additional three nuclear weapon powers to argue, that they too can have nuclear weapons just for the sake of deterrence.

In all, the five nuclear weapon powers have had more than fifty years of either actual or cold war. If given this history, the five nuclear weapon powers have settled down to peace and stability, the same can be reasonably expected in the case of India, Pakistan and Israel too.

The threat to the present nuclear order does not come from the changeover of three hitherto undeclared nuclear weapon states to the declared status. The real threat is only from the proliferation of nuclear weapons from nuclear weapon states to non-nuclear weapon states, in violation of NPT which is not easily penalisable. The nuclear weapon states are also not under any safeguard system which verify and check such transactions. It is a well known fact that attempted proliferation by Iraq had the support, from a number of industrialised nations. When a nuclear weapon power indulges in proliferation, the other powers appear to be reluctant to challenge and bring that power to international accountability, since that would erode the credibility of NPT. This horizontal proliferation, if left unchecked might pose a great threat to world peace.

India's position in the global nuclear order is very important because of its progressive nuclear programme. India has travelled a long distance right from its independence to attain this position. The lessons, India has learnt from its neighbours in the past has forced her to chalkout her own path. It is a must to have a clear view of India's defence policy to know better about its defence planning, research and development in nuclear programmes which has transformed India to "Nuclear India".
DEFENCE POLICY OF INDIA

New India was born in an atmosphere of cold war. Immediately after independence, diplomacy rather than military preparedness was the cornerstone of India’s foreign policy. India’s decision to stay away from the opposing military bloc’s was the essence of its policy of non-alignment. Jawaharlal Nehru, independent India’s first Prime Minister, was the principal architect of India’s foreign policy, of which the country’s defence policy formed an integral part. During the seventeen years from 1947 until his death in May 1964, he was also the country’s Minister of External Affairs, and thus, directly responsible for the active interpretation and administration of that policy.

After independence, self sufficiency was inherent in the policy of non-alignment and it became necessary for India to build its own defence mechanism and to produce its own arms and equipment indigenously. But unfortunately, emphasis was on economic progress and development and the growth of defence was forgotten and ultimately the required balance was lost.

In 1950, India became republic and in the same year China liberated Tibet which had a profound bearing on the security problems of India but Nehru still stuck to the policy of neutrality for the armed forces.18

This neutrality, explained by Nehru was not a negative policy but a dynamic and positive policy of seeking peace in international affairs. During this time, India’s National Security was based on the policy of peace, non-alignment and co-existence. Nehru was very much influenced by the Gandhian doctrine of non-violence and his policy was based

neither on an abstract moral nor entirely on the existing circumstances. Nehru believed that staying away from military alliances in the cold war could reduce military dangers. The events of 1962, proved otherwise. It was only after India’s humiliating defeat at the hands of China that an evaluation of the strategic environment and defence needs began.

China’s victory over India in 1962, made the Indian political leaders realise the importance of defence preparedness. India realised for the first time that she can have enemies other than Pakistan. Unfortunately, however the improvement in defence matters after this disaster, was translated more in terms of money, by way of greater financial allocation than in strategic terms. The 1963-64 defence budget was increased to 867 lakhs, which was double the amount allocated during the budget of 1962-63.

However, India’s improved preparedness was demonstrated during Indo-Pak wars in 1965 and 1971. Even though, India’s defence preparedness improved, there was no credible defence policy for India. The main reason for this state of affairs has been the lack of precise national aims and objectives. The only strategy that India had was a negative defence strategy which means surrendering of initiative to the adversaries and merely reacting to their hostile activities. It can be stated that till the Indo-Pak war of 1971, India never had an offensive strategy against Pakistan. All along these years what India had was an counter-offensive strategy. The net result of this approach has been a repetition of inconclusive wars leading to a state of armed peace between India and Pakistan for the last five decades.

India also had difficulty to decide as to which of the two countries, namely, China or Pakistan is a greater threat. This resulted in the posture of simultaneous defence

*Kousar J. Azam, India’s Defence Policy for the 1990s, Sterling Publishers, New Delhi, 1992, p 40*
readiness against both, spreading its resources with a thin focus. Being in a very geo-strategic region, India had to give more importance to her security policy. India's defence policy, its evolution and growth, largely depends on the Ministry of Defence which traces its origin to 1776, when a Military Department was created in the Supreme Government of the East India Company at Calcutta. Over the years it has undergone substantive additions and changes of nomenclature, to emerge as the Ministry of Defence of the Government of India. The functions of the original Military Department were to record order affecting the army, passed in other departments and to maintain a list of army personnel. After 1909, the Military Department was renamed as Army Department and was redesignated as the Defence Department in 1938. In 1947, the Defence Department became Ministry of Defence under a Cabinet Minister.

In November 1962, a Department of Defence Production was set up with the purpose of dealing with research, development and production of defence equipment. Department of Defence Supplies was created in November 1965. These two Departments were later merged. A scientific advisor to the Defence Minister was appointed to advise him on scientific aspects of military equipments, research and design of equipments used by the defence forces. A Department of Defence Research and Development was created in 1980.

The President is the Supreme Commander-in-Chief. Despite the powers, the President has no control, except for the Prime Minister and his cabinet has the real control over defence policy and in decision making process. For this purpose the Cabinet Committee on Political Affairs (CCPA) is designed to analyse and evaluate the internal and external situations, provide direction and policy to the government to run the country. The CCPA is chaired by the Prime Minister. Its members are Home Minister, Minister
for External Affairs and Minister for Defence. In May 1986, the Minister for Human Resources Development and the Minister for Finance were also made member of CCPA. But the CCPA could only be effective, if the Prime Minister wanted it to be. Of all the members, the Defence Minister plays a very important role in representing the whole defence system. The assent of the Defence Minister plays a essential role in all defence related policies.

All matters concerning defence policies are scrutinized under the watchful eyes of the Defence Ministry. But any defence policy will reveal the consent of the Finance Ministry, Home Ministry and other departments too. For an effective and sound defence policy there should be proper defence planning.

**DEFENCE PLANNING**

The cost of war has always been high and the costs always escalate as years pass by. Modern wars are not expected to last for a long period due to sophistication attained in warfare. "The two week 1971 war cost Rs.400 crores but today the cost per week of war is estimated to be Rs. 4000 crores. A decisive war may last 6 to 8 weeks"[20]. If those are the cost, then it is well understood that planning for defence must be effective to optimally utilize resources.

The Indian government, after 1947 with little experience in managing national security through the use of military force, gave top priority to socio-economic development. The Indian leaders viewed ‘management of violence’ very difficult and different because they were very much attached to the theory of non-violence.

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[20] ibid., p.33
Eventhough, the defence expenditure went up in the 1980s, India still lacked continuous planning. Dependence on diplomacy unsupported by military capability and a disproportionate over emphasis on development against defence, has also proved to be a stumbling block for effective defence planning.

The defence planning can be effective if the following things are carefully analysed.

a) The security environment  
b) A review of the National Security Objectives and  
c) Resource allocation on a long-time basis.

The main aim of defence planning should be national security and defence being a part of it. Everything that would affect a country should be taken into account. Therefore, the defence planners will have to depend on a good Management Information System (MIS) with relevant and upto-date information.

A good defence planning should have a clear picture of the international relations all over the world. Secondly, up-to-date information of technology availability is a must because technology is possibly the single most important thing in the defence field. Changes in technology will initiate a chain reaction bringing changes everywhere. Thirdly, coordinated intelligence is necessary for defence planning to be reliable. Lack of proper intelligence, will time and again lead the defence planners to make decisions which prove to be incorrect.

Thus, effective defence planning will depend largely on expertise awareness and inter-disciplinary approach. This is true, as the emergence of 'Nuclear India' in the
Nuclear World Order was made possible, by the achievements made by the strategic enclaves of India.

STRATEGIC ENCLAVES OF INDIA

India’s nuclear capabilities have been created by a fairly large and powerful bureaucratic structure which is based on three principal complexes. These complexes are:

1. The Atomic Energy Establishment
2. The Defence Research and Development Organization (DRDO)
3. The Space Research Programmes

Since these three are working to produce the most advance technological devices necessary for national security, they have been termed as "Strategic Enclaves". There is a lot of difference between these enclaves and the rest of the military security complex because these three are involved in developing high-quality technological devices. Since these enclaves had their origins in Nehru’s dream of science providing for the creation of a modern state, they have slowly come to dominate both India’s attempts at economic modernization and its efforts to achieve autonomous security.21

Therefore, if an assessment has to be made of India’s future nuclear posture, it cannot be done without taking into account the contribution of these three strategic enclaves.

1. ATOMIC ENERGY ESTABLISHMENT

The atomic energy establishment consists of various nuclear facilities which includes power and research reactors and plutonium reprocessing plants. Even though, these are helpful giving the ability to produce nuclear weapons, India’s future nuclear posture mainly depends on the Bhaba Atomic Research Centre (BARC) in Mumbai. The team which designs India’s nuclear programme is reported to be located here and it is also said that the details regarding the ‘physics package’ for the weapons used in the 1998 nuclear tests was also engineered here only.

The Atomic energy establishment is likely to have some policies that will have a significant impact on India’s future nuclear posture. Firstly, it is said to continue its research and development on weapon designs, which will show interest to develop a limited number of different types of nuclear weapons which can be carried by a variety of delivery systems. The atomic energy establishment will also work on advanced nuclear designs, which catches the first place in Research and Development.

Secondly, this enclave will press for the continuation of nuclear tests. Since, India conducted the first nuclear explosions in 1974, this establishment has conducted many debates and had, from then on recommended for the continuation of nuclear tests.

Thirdly, this enclave appreciates India’s decision to refuse to comply with the US request for a moratorium on the production of fissile material, pending the conclusion of an FMCT. It also wants India to continue with this same policy. This shows that this establishment is primarily aimed at developing the stockpile which India needs in the future to prove itself to be an effective deterrent.
2. DEFENCE RESEARCH and DEVELOPMENT ORGANIZATION (DRDO)

The second complex known as the Defence Research and Development Organization (DRDO) was established in 1958, by amalgamating the Defence Science Organization and some of the technical development establishments. A separate department of Defence Research and Development was formed in 1980. It consists of some fifty separate defence laboratories and institutions engaged in developmental activities relating to aeronautics, electronics, weapon systems, etc. Other elements of this complex are tasked with developing the technical sub-systems required for effective command and control including food technology and nuclear medicine.22

The notable success of this department include the surface-to-surface missile Prithvi, the state-of-the art main battle tank Arjun and super computers. The weapons and ammunition developed by the organization and productionized by production agencies include the Indian field gun, illuminating ammunition for enhancing night-field fighting capability, new generation bombs for high-speed aircraft, etc.

"In the area of electronics and instrumentation, amongst the significant developments are low-level tracking radar Indra I and Indra-II for Army and Air Force, surveillance radar, automatic electronic switch, avalanche victim detector. Some of the development successes in the area of engineering systems are bridge-layer tank Kartik, military bridging systems and rapid intervention vehicle. In the area of naval systems and materials, the organization has developed an advanced ship sonar system, marine acoustic research ship and torpedoes."23

22 Jaswant Singh, Defending India, Mac Millan India Ltd., New Delhi, 1998, p.138
23 ibid., p.139.
India has decided to become a declared nuclear weapon state, which imposes certain new obligations on India. First, this complex will concentrate in developing a range of delivery systems that are resistant to interception. This complex has stated that it will take efforts in developing long-range ballistic and cruise missiles aimed primarily at China but secondarily at Pakistan as well. India has so far made noteworthy achievements in these areas. Apart from this, this complex has plans to take development efforts in the construction of a nuclear arsenal. However, at present it is very keen to develop specific delivery systems for the existing nuclear weapons.

3. SPACE RESEARCH PROGRAMMES

The space programmes in India are looked after by the Indian space research organizations. The space programme consists of developing a variety of launch vehicles; acquiring systems engineering expertise; producing remote sensing, communications and meteorological satellites; and maintaining the organisational infrastructure for controlling its space assets.24

The Indian space programme was formerly organised in 1972 with the setting up of Space Commission and the Department of Space to promote the development and application of space technology. The Indian space programme started in Thumba, soon spread to various places in India in the form of research and development institutions. The benefits of the national space programmes gradually reached the nation's grass roots and influenced the lifestyles of the people.

The Indian space programme is very successful because of the Space Commission which acts as a nodal agency for co-ordinating research and development activities in space science and technology. The space programme is executed mainly through the Indian Space Research Organization (ISRO), National Remote Sensing Agency, Indian National Satellite Space Segment Project, National Natural Resource Management Systems and Physical Research Laboratory.

After 1970, the Indian Space Programme has progressed well from the experimental phase to the Operational phase. India conducted large scale demonstrations of space applications like, Satellite Telecommunication Experimental Project (STEP) and Joint Remote Sensing Experiment Projects (JRSEP). Along with these projects, India simultaneously developed experimental satellites like Aryabhatta, Bhaskara, APPLE and Rohini series and Satellite Launch Vehicles like SLV-3 and ASLV.

The Indian space community has always associated itself with economic development, as this was the path shown to them by its founding father Vikram Sarabhai. Right from its institution, the Indian Space Programme has kept itself from participating in any of the country’s military programme and till this day it carefully maintains its position by keeping itself away from the strategic activities of the other two complexes. The Indian Space research programme, through a combination of foreign collaboration and its indigenous efforts has developed an ability to build a variety of space launch vehicles and communications, meteorological and earth observation satellites.

International co-operation is an important element of the Indian Space Programme. The establishment of Equatorial Rocket Launching Station close to the equator near Thiruvananthapuram at Thumba, and launching experimental satellites like Aryabhatta, Bhaskara and APPLE, involved co-operation with other countries. India not only gets help
from other countries to develop its space programme but also share’s its own experience with other developing countries by training their personnel under a programme called SHARES. A space centre namely, the UN Asia-Pacific Regional Centre was set up in India in November, 1995. This is a recognition for India’s role in sharing its experience in the development and application of space technology for social benefits.

India’s development in space programmes can be highly beneficial. With these impressive achievements, the space research programme, eventhough started for some other objective, will contribute in supporting the Indian nuclear posture, even if only indirectly. Several of the specific technologies, required to develop a credible deterrent are space-related, that is why India’s atomic and defence research complexes are dependent on space research organizations for solid fuel rocketry, satellite based reconnaiss ance and ground based surveillance systems. As an example, the Polar Satellite Launch Vehicle (PSLV), a booster with 20 metre long, 2.8 metre wide, five segment, solid rocket motor launch vehicle, if developed into a ballistic missile, could easily carry a 1 ton military payload out to intercontinental ranges.\(^5\)

Apart from transfer of technology to military sector, there can also be seen, transfer of personnel from space programme to military sector. A.P.J.Abdul Kalam, previously the manager of the Integrated Guided Missile Development Programme, for example, was a space engineer who was then transferred to the Defence Research and Development Organization (DRDO), in order to head the new missile research and development effort. Reports say that important exchanges are likely to take place in the

*ibid., p.98.*
form of knowledge transfer carried out through collaborative work across various complexes.

It is obvious that the importance of the country’s three strategic complexes is likely to increase overtime, with significant implication’s for India’s nuclear posture, thereby having a direct impact on India’s strategy and security equations.

RESEARCH PROBLEM

India, being a developing nation, has to focus more in socio-economic development but it is also under compulsion to build proper and reliable defence for its millions of people, because her past experience has proved that diplomacy alone, will not save her from any external aggression. So, she has endeavoured successfully to develop indigenous nuclear, missile and space programmes for which millions of rupees were allocated each year, in the Union budget. Today, she has achieved the capability for a massive and assured retaliation which is well enough to deter her rivals from daring an aggression.

On January 4, 2003, the Indian Government made public, a set of political principles and administrative arrangements, to manage its arsenal of atomic weapons. This statement also mentioned the decision of the Cabinet Committee on Security (CCS), to limit India’s capability to a "credible minimum deterrent" and the commitment to use nuclear weapons only in retaliation. India also reaffirmed, that it would not use nuclear weapons against non-nuclear weapon states and against nuclear weapon powers, its strategy would remain that of "No-first use".
Therefore, the research question is, India, with a policy of 'minimum nuclear deterrence', already has scores of missiles with various ranges and a well established nuclear weapons programme. Having achieved this capability, is it still necessary to spend crores of rupees annually in strengthening its nuclear arsenal instead of spending it for socio-economic development.

HISTORY OF THE INDIAN NUCLEAR POLICY

While examining the factors that have influenced India’s nuclear posture and the role these factors might play in shaping the country’s future, it is important to recognize the strategic environment of India.

South Asia comprises of seven nations (viz) India, Pakistan, Bangladesh, Nepal, Bhutan, Srilanka and the Maldives. Of all these nations, India is the largest, both in terms of population and area. After India’s independence, Nehru became the Prime Minister and he had the opinion that nuclear energy should be used only for economic development and that, it should never be used as weapons of mass destruction. So, he raised his voice for nuclear disarmament in national and international platforms. Further, he believed that disarmament would help India, to avoid spending huge sum of money on enlarging its arsenal and instead, it would help her to make maximum utilization for development purposes.

After the Sino-Indian war of 1962, in which India suffered a humiliating defeat, Nehru realised that his policy was far from reality. Meanwhile, China developed close relations with Pakistan. During Indira Gandhi’s period, India refused to sign the Non-Proliferation Treaty (NPT), stating that it was discriminatory in nature. In the year 1974, India conducted a nuclear test at Pokhran in Rajasthan desert, which had a 15 kiloton yield. This test demonstrated India’s capability to make nuclear weapons, if she is compelled.
Then during Narasimha Rao’s period, India prepared to carry out a nuclear test in December 1995, but it could not test because of US pressure. In the 1996, General Elections BJP came to power and on May 11th and 13th 1998, India conducted a series of five nuclear tests. The tests have proved that India has the capability for a weaponised nuclear programme. After these tests, United States imposed heavy economic sanctions on India. Moreover, US asked India to unconditionally sign the CTBT and freeze its entire nuclear weapons programme, at the level achieved with the completion of the Pokhran II nuclear tests, but India refused to roll back its nuclear programme.

DEVELOPMENTS AFTER THE POKHRAN II NUCLEAR TESTS

After the Indian nuclear tests on May, 1998, the BJP Government formed a task force, to suggest an organisational structure for a National Security Council (NSC). Following their recommendations, a new National Security Council was formed in 1998. The National Security Council serves two purposes of long-range strategic planning and close monitoring of geo-political and threat environments for issuing effective warning. The NSC ordered the National Security Advisory Board (NSAB), to formulate an Indian nuclear doctrine. Following this, an Indian nuclear doctrine was drafted and it was released by the National Security Advisor, Brajesh Mishra on August 17, 1999. The logic of India’s nuclear doctrine is built on certain principles which contains 8 parts (viz) preamble, objectives, Nuclear forces, credibility and survivability, command and control, security and safety, research and development, disarmament and arms control.

On January 4, 2003, three years after the release of the nuclear doctrine, India made public, a set of political principles and administrative arrangements, to control its nuclear arsenal. Maximum restraint in the use of nuclear weapons, absolute political control over decision making and an effective link between civilian and military leaders
in the management of atomic weapons, were some of the important decisions taken by the Cabinet Committee on Security (CCS), which met to review the progress in implementing India's nuclear doctrine and the procedures of the Central command and control of its strategic forces.

Although, the broad outline of India's nuclear doctrine was known, the nature of the command and control over the atomic arsenal had remained unclear. The Government filled that gap by revealing that a two layered structure called the Nuclear Command Authority, was responsible for the management of its weapons.

The Cabinet Committee on Security, has also decided to limit India's capability to a "credible minimum deterrent" and the commitment to use nuclear weapons only in retaliation. India also reaffirmed that it would not use nuclear weapons against non-nuclear weapon states and against nuclear weapon powers its strategy would be that of "No-first use". India also said that, its arsenal aimed to deter threats, not just from nuclear weapons but also those from chemical and biological weapons.

REVIEW OF LITERATURE

Amit Gupta in his book "India's nuclear security", examines the need for India to go nuclear, explaining the Indian nuclear tests of 1998 and the Indian missile and nuclear programmes. Apart from this, he also explains the rapid proliferation of Ballistic missiles in the South Asian region. He has also elaborately dealt with Pakistan's nuclear arms race with India.

Kousar.J.Azam's "India's defence policy for the 1990s", is a book containing collection of papers on India's defence needs for the 1990s in the context of the changing
scenario of international politics. It also gives details about the strategic equation after the end of cold war, especially in the South Asian region.

Amitabh Mattoo’s "India’s nuclear deterrent: Pokhran II and beyond", focusses primarily on the scientific dimensions of the Pokharan II nuclear tests and the economic consequences of the sanctions imposed. It also provides details about India’s policy towards the Missile Technology Control Regime (MTCR), Comprehensive Test Ban Treaty (CTBT) and the Fissile Material Cut-off Treaty (FMCT).

Major. Sulakshan Mohan’s "India’s nuclear leap", provides details about the evolution of Indian nuclear policy, which culminated in the nuclear test of 1998 and the consequences faced by India in the aftermath of the nuclear tests. It also explains the deadly consequences of nuclear war in general, by citing the destruction of the twin cities in Japan, during world war-II.

Anindyo J.Majumdar’s "Nuclear India into the new millennium", comprehensively explains, the deterrence, security and co-operation in nuclearised South Asia with reference to India, China and Pakistan. It also provides information about India’s Pokhran II nuclear test and the response of US, Russia and other nations of South Asia and Europe. It also explains India’s relationship with Pakistan and China.

Rear Admiral Raja Menon’s "A nuclear strategy for India", explains India’s geopolitical environment and its international relations. It also brings out details about the Pokhran I nuclear test, conducted during Indira Gandhi’s period and also the road to Pokhran II. It also provides information about the Indian missile force and also its command and control systems.
Mukesh Kumar Kayathwal's "Security and foreign policy in South Asia", explains the South Asian Security in the post cold war period and also the missile proliferation in this region. It also provides information about India's strategic policy of the past and the future with reference to India's relationship with its neighbouring countries Sri Lanka, Pakistan and China.

Ashley J. Tellis in his book "India's emerging nuclear posture", explains the heritage of nuclear ambiguity and the variables affecting India's nuclear posture. It gives information about the global nuclear regime, India's relation with key countries and the regional nuclear threat environment. It also provides information about India's emerging nuclear posture after the Pokhran-II nuclear tests.

V.D. Chopra's "Double talk on weapon's of mass destruction and Indian security", explains India's stand on global nuclear disarmament. Comprehensive Test Ban Treaty and Fissile Material Cut-off Treaty. It also highlights the Chinese threat in the context of India's security environment, evaluating India's nuclear weapons capability and India's position in the new world order.

Col. B. Sarkar's "Pakistan seek's revenge and God save's India", explains low intensity conflicts, insurgency and counter-insurgency operations. It traces the genesis of insurgency, which is financed and abetted by Pakistan. It also provides information of how the Kashmir issue has aroused nuclear arms race in the Indian sub-continent.

K. Subramanyam's "Nuclear proliferation and international security", critically analyses global nuclearisation, uncontrollable weapons and the proliferation of nuclear
weapons world wide. It also explains the nuclear strength of several developed nations and the insecurities of the developing nations.

Jaswant Singh's "Defending India", elaborates and discusses in detail India's military strength and its operations. It also draws out a clear picture of India’s defence expenditure and its force structure in the past and the present.

B.M. Jain's "Nuclear politics in South Asia", is a scholarly attempt to break new grounds in the field of nuclear studies, with particular reference to South Asia. It examines the various existing approaches to the Nuclear Crisis Management (NCM) in South Asia. It also offers an alternative psycho-cultural paradigm which has almost remained neglected in the studies undertaken so far by other scholars. Apart from this it also analyses the Chinese role in nuclear policies of India and Pakistan, CBM’s and nuclear restraint and nuclear future of South Asia.

Jasjit Singh's "Asian Strategic Review 1991-1992", makes a comparative study over the military systems and defence policies of all the prominent countries in Asia. It also deals in detail with nuclear weapons and ballistic missile proliferation among the Asian countries with special reference to China, Pakistan and India.

The studies previously done, have not explained elaborately about the developments in India, after the Pokhran II nuclear tests. This study fills the gap between 1998 and 2003 by analysing the National Security Council, the Indian Nuclear Doctrine and the Nuclear Command Authority. This study also analyses, the various decisions taken by the Cabinet Committee on Security on the Principles of Indian nuclear doctrine.
OBJECTIVES OF THIS STUDY ARE AS FOLLOWS:

a. The test ban treaties and India's stand.
b. Strategic location of India and threat perceptions.
c. Evolution of Indian nuclear programme and its development during various periods.
d. The conception of Indian missile programme and its progress.
e. Pokhran II nuclear tests and the reaction of the world.
f. India's nuclear posture in the aftermath of the May 1998 nuclear tests.
g. The importance of the Nuclear Command Authority.

METHODOLOGY

The research is historical, descriptive and analytical. The study is based on both primary and secondary data. The primary data have been collected using Questionnaire and Interview techniques. Simple Random Sampling Technique has been used to select samples from the intellectuals. The other sources of primary data are Parliamentary debates and annual reports of the Ministry of Defence.

The sources of secondary data are historical records, government reports, treaty documents, magazines, journals, press reports and manuals.

ANALYSIS OF DATA

The primary data collected through questionnaire, were further condensed through tabulation to find out percentage and intellectual's opinion.
The secondary data collected through historical records, were compiled periodically and presented in a pattern, which will bring the progress of Indian nuclear policy step by step.

CHAPTERISATION

The study begins with Chapter I, which is an introduction about the genesis of Nuclear age, Nuclear proliferation, Nuclear test ban treaties and the Indian response. This chapter also explains the "Nuclear World Order" and India’s position in it.

Chapter II identifies and examines the strategic factors affecting India’s nuclear posture. It also analyses India’s relationship with its neighbouring countries.

Chapter III focusses on the evolution of the Indian nuclear policy and its development during various periods.

Chapter IV deals with the Indian missile programme and also Pakistan’s missile race with India.

Chapter V discusses in detail, India’s defence policy and its nuclear posture after the Pokhran II nuclear tests.

Chapter VI is the conclusion which sums up the major findings of the study and provides recommendations.