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Nuclear Weapons and Their Significance in the Management of National Security

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ABSTRACT

The study explores the origin, development, and significance of nuclear weapons in shaping global and national security policies. It discusses the fundamental concepts of nuclear armament, the characteristics and classifications of nuclear weapons, and their role in deterrence and strategic stability. The paper highlights the destructive potential of nuclear arsenals and examines how their deployment has influenced the doctrines of major powers such as the United States, the Soviet Union, and China. Particular attention is given to India's nuclear environment, especially in relation to Pakistan's uranium enrichment programme and China's advanced missile capabilities. The discussion underscores the geopolitical complexities and security challenges faced by India in South Asia, emphasizing the continuing relevance of nuclear deterrence in maintaining power balance. Ultimately, the paper concludes that while nuclear weapons symbolize national strength and self-reliance, they also pose immense moral, political, and existential risks to international peace.

Keywords: Nuclear weapons; deterrence; strategic stability; India–Pakistan nuclear rivalry; China; missile development; national security; nuclear proliferation; arms race; South Asia.

INTRODUCTION

The world nuclear weapons is often regarded as mysterious and highly technical, the exclusive of military planners and physicists. While the specific details of weapon manufacture and employment are concealed by secrecy and remain behind the scientific and engineering walls which shield any high technology. The general issues raised by the presence of Nuclear Weapons in today's world are neither hidden from public view nor difficult to comprehend. Moreover, they are issues which affect all our lives, and as such merit attention by a much wider group of people than those who deal with them on a daily basis.

What are Nuclear Weapons?

Nuclear weapons derive their enormous explosive force from either the fission or fusion of atomic Nuclei. Their significance may be appreciated by the coining of the words kiloton (1,000 tons) and megaton (1,000,000 tons) of TNT equivalent to describe their blast effect. The first Nuclear weapons were bombs delivered by aircraft; warheads for ballistic missiles have come to be by far the most important Nuclear weapons. Nuclear weapons have been developed; they include artillery projectiles, howitzer shells and demolition munitions.

THE CONCEPT OF NUCLEAR WEAPONS:

There are three concepts of Nuclear weapons underlying:

1.The first part lead to two models for a world in which nuclear weapons have been prescribed. One, the "incremental" model, would retain the nation-state system and make only those changes necessary to help nations succeed in eliminating Nuclear weapons. The second, one, the "internationalized" model, would transfer citizen loyalties from the national order to an international order. Thus, transform politics in a way that leaves nuclear weapons essentially irrelevant to the conflict that might arise.

2. The second part might still arise under the two models of a denuclearized world. It suggests the political effects of denuclearization under the two patterns and outlines more fully the institutional and political requirements for the two patterns. These requirements are heavily shaped by world economic and political

goals, the primary emphasis in this section is upon military security issues. The section concluded with an estimate that the denuclearized incremental world is not desirable, but the internationalized version is desirable.

3. The third part examines the transition to the denuclearized worlds and reviews the three crucial aspects of that transition. The phasing out of Superpower nuclear deterrence; the entry of developing countries and of potential challenging great powers, such as Brazil and Iran, into the structure; and the transfer of power from rational Government to International Bodies.

Nuclear weapons have four effects that argue for their undesirability with existing institutions.

a) The first is the destruction, that might occupy AN even "limited" use of nuclear weapons is disproportionate to the goals that can be obtained through their use. The emergence of nuclear deterrence muted the fears, reflected in the initial Acheson –Lilienthal plan that there could be no defense against Nuclear weapons.

b) Second, with the spread of nuclear weapons, the balance-of-power system the Classical way of controlling conflict between autonomous opposed actors- may lose its ability to maintain peace. A successful balance of power structure requires an ability to shift coalitions to bring a preponderance of power against a potential combatant.

c) Third, Nuclear weapons are adapted to attacks upon civilians than to attacks upon military forces. This anti civilian role raises profound moral issues. It also affects the philosophical relationship between governmental and citizen, for in the Nuclear era a government can defend its own citizens or through agreements with other governments, sometimes even designed to leave its own citizens vulnerable.

d) Nuclear weapons rational governments military power that is substantially independent of the contributions and control of the citizency of the nations. Once the Nuclear weapons are built- a process that will become increasingly cheap for all but those engaged in large – scale deterrence competitions- the contemporary government controls its Nuclear power independently of the people and husbands its relatively independently of the economic and political factors that shaped conventional military capability.

CHARACTERISTIC OF NUCLEAR WEAPONS

There are 13 characteristics of Nuclear weapons underlying:

- Destructive power.
- Existing Stockpiles.
- Stable deterrence.
- Strategic stability.
- Launch-on warning.
- Launch-under-attack.
- False alarms.
- Missiles.
- Warheads.
- Recently vehicles.
- Tactical Nuclear Weapons.
- Intermediate-range Nuclear weapons.
- Strategic Nuclear Weapons.

They are described below:

1. DESTRUCTIVE POWER:

Some Nuclear Weapons have greater explosive power than all the bomb dropped in World War II. The two bombs used in the devastation of Hiroshima and Nagasaki each had the explosive force of 13,000 tons of conventional TNT. Today even the smallest strategic Nuclear weapons carries many times the explosive power of the two weapons that destroyed these Japanese cities.

2. EXISTING STOCKPILES:

The United States has a current stockpile of nuclear weapons estimated to have the destructive power of several thousand megatons distributed in approximately 26,000 Nuclear warheads of all kinds. The Soviet Union's Stockpile of Nuclear Weapons is believed to be of somewhat smaller size, but with even more megatons. A conservative calculation predicts that 400 megatons would be sufficient to destroy most of an adversary's industrial lease and immediately kill hundreds of millions of people.

3. STABLE DETERRENCE:

Most observers believe a major conflict between the superpowers has been avoided because both have recognized the catastrophic consequences of a nuclear confrontation. Technology today provides each nation with the capability to maintain a sufficiently large, diverse, and survivable strategic nuclear force to dissuade the adversary from nuclear attack. Threatened with catastrophic retaliation, neither power has the incentive to utilize its nuclear arsenal in a crisis situation. This stalemate between the arsenals of destruction is referred to as a situation of stable deterrence.

4. STRATEGICS STABILITY:

The large size of the Nuclear arsenals, there is no guarantee that the condition of "Stable deterrence" will remain in effect. As technology has progressed, Nuclear weapons have become increasingly accurate and thus increasingly threatening to the other side. The resulting insecurity has led both sides to continue to arm themselves with still more sophisticated weapons. Increased vulnerabilities have also led to fears of an increased probability that a nuclear exchanged could start. Strategic stability is a balance of forces whereby neither side feels threatened and where pressures to arms are decreased. But this condition of Strategic stability may not survive in the absence of negotiate of restrictions on new Nuclear weapons.

5. LAUNCH-ON WARNING:

If the Nuclear arms race continues uncontrolled, the increased accuracy of nuclear weapons may alter the conditions of stable deterrence. As each side's forces become increasingly vulnerable, the impulse to use weapons rather than risk losing them will become greater especially at a time great of crisis when there are indications of military preparations on both sides. This is described as a launch –on-warning strategy.

6. LAUNCH-UNDER-ATTACK:

Almost as grave a risk would be created by a strategy of launch under attack. This would involve the launch of nuclear weapons on first indication from satellites and other warning systems that the other side's missiles were headed for its largest in the United States on the Soviet Union.

7. FALSE ALARMS:

A report prepared by the Senate armed services committee attests to 3703 alarms from January 1979 to June 1980 which were routinely assessed and dismissed; but 147 false alarms were so serious that they required evaluation as whether they represented a potential attack.

8. MISSILES:

A missile is a vehicle that can deliver an explosive device (war head) to a target from distances up to thousands of miles.

The two general types of missiles are:

(a) Ballistic Missile:

A missile that is fired into a trajectory or path outside the earlier atmosphere and is then pulled down on its targets under the influence of gravity.

(b) Cruise Missile:

A pilotless airplane, about 20 feet long, with wings, a tail, a jet engine, and a computer that acts as a pilot, cruise missiles fly low adjusting to the terrain, are hard to spot on radar and are considered to be extremely accurate.

9. WARHEAD:

A warhead contains the fuse and materials that create the atomic explosion. In the case of a ballistic missile, the warhead is mounted on the front end within the nose come that constitutes the recently vehicle.

10. A REENTRY VEHICLE:

RV is that portion of the missile that carries and houses the warhead. It is propelled beyond the earth's atmosphere; at the end of its flight, it reenters the earth's atmosphere and hits the target. Some ballistic missiles carry only one recently vehicle; others carry several, each of which can be directed with high accuracy to widely separated targets. These latter are known as MIRVS.

M - Multiple
I- Independently –targetable
R- Reentry
V- Vehicle.

Large ballistic missiles can carry ten or more warheads. Currently planned cruise missiles have single warheads only.

11. TACTICAL NUCLEAR WEAPONS:

Tactical Nuclear weapons are short range, typically 100 miles or less, low-yield Nuclear weapons designed for combat use on the battlefield. These weapons cannot reach rearguard forces of the opponent.

NATO contemplates use of such weapons to defeat a massive conventional attack by Warsaw pact forces. Within NATO, they remain in the hands of U.S. forces only. Soviet forces are similarly equipped.

12. INTERMEDIATE RANGE NUCLEAR WEAPONS:

It also known as long-Range Threat Nuclear Weapons- are of longer range, 1000 to 2500 miles, and larger yield than a tactical Nuclear Weapons, and would be used only in virtually all-out war involving NATO and

Warsaw pact forces. Intermediate range culler weapons have become increasing accurate and can be delivered by land-based missiles, submarines and surface ships, as well as by aircraft.

13. STRATEST NUCLEAR WEAPONS:

When launched from either the U.S. or the U.S.S.R have sufficient range to destroy military, industrial, cent urban targets in the other side's homeland.

The three principal strategic weapons systems with sufficient range to reach Soviet and American target are:

(i) ICBMs- Intercontinental Ballistic Mission.
(ii) SLBMs- Submarine – Launched Ballistic Missiles
(iii) Strategic Bombers – Aircraft of intercontinental range.

DEPLOYMENT OF NUCLEAR WEAPONS

The main role played by Nuclear weapons which has been a strategic one- to support a century's doctrine a deterrence. In the US this doctrine has ranged from so called massive retaliation in the 1950s to mutual deterrence in the 1970s. Most New Nuclear powers have chosen the long-range heavy bomber as their first Nuclear Weapons carrier. Early carriers were modified various of existing aircraft; later planes were designed for the large ranges, high speeds and other characteristics thought necessary.

Several developments were needed before the intercontinental ballistic missile become militarily attractive. The fleet ballistic missile system of the US Navy, Started in 1956, saw the first polarizes submarine, the Nuclear powered "George Washington" become operational on November 15, 1960. The Minuteman missile system of the U.S. Air Force, stated in 1958, saw its first Squadron become operational in early 1963. In the early 1970s new versions of the Polaris and Minuteman were deployed, capable of carrying multiple, independently targetable recently vehicles.

The Soviet Union deployed its Nuclear Weapon in a pattern similar to that of the U.S. except for the early postwar years when it built a large, intermediate range ballistic missile force, targeted for Western Europe.

The United Kingdom and France have selected a sub-marine launched ballistic missile system as their main nuclear deterrent force. The U.K. deployed four and France planned to deployed five Polaris- like submarines in the mid-1970s. In addition, France was employing 18 IRBM's in sites Silos Haute- Provence.

In the early 1970s, China had made no statements on the method, it would use in the deployment of its nuclear stockpile. Its fourth nuclear weapons test was delivered by a missile. U.S. estimates were that that the Chinese would be capable of producing up to 25 ICBM's by 1975.

NUCLEAR ENVIROLMENT

In this context. India and Pakistan have exchanged the protocols agreeing not to attack other 's nuclear facilities. Both the countries will soon hand over a list of their facilities with their locations to each other. Pakistan's nuclear programme is handed by a full-fledged organization designed addition to providing nuclear energy. Chinese have provided major nuclear technology to Pakistan; they are friends. Thus, India has to take an overall view of this strategic environment. India cannot afford to deal only with Pakistan in isolation of the nuclear threat from China. Thus, India has to take note of China's geostrategic interests not only in South Asia but also in West Asia and the Asia Pacific region. But China is bound to make its stretch global, with a powerful Navy and air power. India cannot afford to ignore this aspect.

The Nuclear and Strategic threat to India is also to be viewed in the light of the military and strategic relationship between China and Pakistan. China wants a weak India so that it cannot pose a threat to it China's thrust in West Asia before the Gulf war was very aggressive. It had been selling arms to Iran, Iraq, Saudi Arabia and Syria. It was using Pakistan's strong ties with the Muslim and Arab world to extend its reach deep into west Asia in Competition with the USSR but in support of US policies. What happens in the Gulf now that the war is over is of very serious concerns to India's Security? It is evident that serious efforts are being made to destroy the Nuclear weapons, Chemical and biological weapons capability of Iraq.

Now Pakistan's nuclear effort is based on uranium enrichment technology, procured piecemeal. Pakistan procured the gasification plant, which converts Uranium ore into Uf-6gas. This gas is fed into higher speed centrifuges. Pakistan has procured these from West Germany and other European countries. Some of the gaps were filled by the Chinese. Now Pakistan has enrichment plants at Sihala and Kahuta.lt has attained an extremely high level of Uranium enrichment. For the manufacture of weapons, one needs 90% level enrichment. Pakistan has purchased adequate amount of Marnging 350 steel to make at least 14,000 centrifuges. It each centrifuge has a capacity of 5 SWU of per year, then Pakistan has a capacity to produce 70,000 SWU of 95% enriched uranium- This will give Pakistan a capacity to produce 12-14 weapons per annum. This enhanced capacity was achieved by expanding the Kahuta complex during 1988-89 and 1989-90.

Pakistan's program me of weapon development has been running parallel with the acquisition of enrichment capacity. Pakistan had been buying beryllium which is used as a neutron reflector in weapon programme. The aim is to reduce the critical mass, trigger the chain reaction which would lead to a nuclear explosion by increasing the density of neutrons called neutron influx. In July 1985, Pakistan had tested Krytrons, which trigger the conventional explosion which in turn triggers the nuclear chain reaction. The uranium bombs need not be tested. In spite the fact that US intelligence agencies were aware of Pakistan's nuclear weapons programme the carter, and the Ragan Administration as well as the Bush Administration till 1990, chose to support the programme.

Pakistan has adopted a policy of nuclear ambiguity. It has been asserting, where geopolitically or strategically required, that it has the nuclear capacity a deterrent value. But it has always denied it officially as it stands to lose too much by declaring it openly.

Pakistan has enriched enough uranium for a good stock pile of bombs. It is not willing to halt it in its national interest. If Pakistan has been accepted as a defects nuclear weapon power India has no choice but to cater for it, in loud and clear term, in its national interest. That possibly may be the only way to generate Indo –Pak amity

Asian nations will become the victims of Pakistan's nuclear capability, attained with the active connivance of the USA, China, Canada, Germany and France. In addition to China transfer to technologies and sale of missiles, has been supplying heavy water and possibly even enriched uranium. Pakistan has F-16 aircraft which are capable of carrying nuclear weapons. It has it own missiles and it has been sold on supplied some by the Chinese. It can also be assumed that Pakistan already has stockpile of at least so weapons in its arsenal.

If Pakistan's overall strategy is considered, of which the use of strategic and nuclear weapons could be an integral part, then it will decide to act against India when in its evaluation the overall situation, geopolitical, military and regional, is decisively in its favour. Pakistan will go on the offensive to resolve its outstanding issues with India including the Kashmir issue. Pakistan will employ the strategy of issuing a nuclear threat against India. Issuing a nuclear threat implies that the country issuing the threat is prepared to use the weapons.

With Pakistan having the nuclear weapons and India and possessing, as is alleged, will create an asymmetric situation in South Asia. This should not be allowed by any strategic planner in India, particularly so when the nuclear weapons in Pakistan are not under political control but control of the defense force. This, therefore is the perspective in which to view Pakistan's nuclear capability and strategic weapons programme.

China is the only country which has placed greater emphasis on the development of nuclear weapons than on conventional weapons. This policy decision had been taken by China in order to neutralise the nuclear weapon threat both from the USA and the USSR and later because it considered nuclear programme more economical and cost effective. China has given national honours to its nuclear and missile scientists. China has come a long way from Soviet SS4 to hundreds of MRBMs and IRBMS. Its first ICBM, CSS-3 which has a range of 8000 km. In 1980 it developed full range CSS-4, which has a range of 10000 km. By 1982 it brought into service CSS n-X SLBM a submarine launched ballistic missile. It is now carrying out a programme on the development of MIRVS, multiple independent re-entry vehicles. It now has a strategic missile corp.

For China nuclear weapons were the symbol of power, self-reliance and security. Thus, China's nuclear and missile programme moved ahead with great speed. China now has many missiles producing and assembly plants at Baotow, Sian, and Shenyang. The shells and engines of the missiles are produced at Shenyang, Suan, Kansu and Chengdu. Solid and liquid propellants are produced at Hunan.

Thus, in the new world order the Chinese nuclear capacity will assume different importance China's developed communications with nuclear powered and nuclear weapon equipped submarines will be the focus. Although 1300 Chinese nuclear weapons do not have as much Sophistication as the American or the Russian missiles, in a nuclear war these can cause the USA and the USSR enough damage.

The Chinese threat to India security, unless resolved as a consequence of the present Sino-Indian talks, must remain the foremost in the minds of India's security planners. Chinese ICBMS at Shungchengzi could strike any apart of India. China's IRBMS or MRBMS located in Tibet pose the same threat to India.

Sino-Soviet relations and Indo-US relations are on the mend. USSR- India equation is yet viable. Therefore, in such a scenario Indo-Pak relation are fragile, acrimonious and adversary. Even if Russia-Pakistan's relations improve not much will come of it. Given the imbalance between India and Pakistan, having a technological edge and will India be having its own defense industry. Pakistan's nuclear weapons status has been declared by the USA. As India declares its nuclear status and Pakistan seeing no advantage in clandestine nuclear weapon programme will also declare its status to enjoy the MAD status. As far as, global reaction to such a situation. It should be to accept the theory that India and Pakistan are entitled to equip themselves to counter each other's capability. There is no doubt that once they come out in the open there will be nuclear arms build-up on both sides in an arms race. But it also has the potential of bringing sanity to indo-Pak relations and initiate a defense.

Third world countries, which include India and Pakistan, have been pursuing advanced weapons technologies to be self-reliant in their defense needs and at the same obtain sufficient levels of deference as would enable them to grow peacefully. The thrust of such efforts has been the development of missiles. These missiles earlier were associated only with nuclear weapon i.e. nuclear warheads.

India initiated the Integrated Guided Missile Development Programme (IGNDP) in 1983. Having a large defense equipment under license. This programme was India's endeavor at self-reliance in R and D. India's security planners had applied themselves to the security concerns; Vis-à-vis China. China has shown indifference to this programm. It considers India's missile programme to be its own national security matter, while Pakistan, viewing India in an adversary role, saw it to be directed against it at acquiring technologies and missiles from China. Their HATF I and II and another missile with 800 km range will become operational simultaneously when Prithvi and Agni become operational in India Pakistan multistage rocket fired in January 1989 gives it a range of 2200 kms, in SSM mode in its height payload combination. PRITHVI, SSM has already been test-flown over five times. It will be mounted on 8x8 wheeled truck. It is to be manufactured at BDL

Hyderabad and its vehicle at BEML, Bangalore. In May 1989 India test-launched its first –IRBM, the AGNI. It has been flight-tested twice. AGNI is a totally indigenous IRBM – a great national achievement. AGNI has a range of 2500 kms to 5000 kms. These missiles are capable of carrying nuclear as well as conventional warheads. AKASH is a 25 kms range SAM. It has two stage rockets. It is effective in ECM environment because comprehensive ECCM and ESM system have been incorporated. NAG is ATM which compares favorably with any contemporary anti-tank missile. NAG has a range of 4 to 6 kms and is configurated to attack armored vehicles from top where they have the least amour. India is now experimenting with a 60 km. range AAM for use with its LCA and India should be able to make an ICBM within a couple of years. Prithvi is more relevant to Pakistan and AGNI is more relevant to China. The western world feels that this missile development by India implies nuclear weaponry.

Amongst the developing nations India's space programme is highly advanced. The work on SLV commenced in 1967. This programme initially launched ROHINI series of sounding Rockets. In 1979 SLV-3, a four-stage, solid propellant system was used to launch a satellite. Since 1983 the work on ASLV has started. India ASLV carries a 150 kg payload into into low each low orbit. In addition, work is going on poplar SLV (PSLV) and geosynchronous SLV (GSLV), with payloads in excess of 1000 kg and using inertial guidance systems.

India already has a nuclear and missile threat from China and Pakistan. With the developments in Iran and Pak-Afghan issue continuing to linger on, the threats, both missile and Nuclear, to India, are considerable and will continue to exist for many years. Thus, India has to take such a perspective into account in all its planning.

CONCLUSION

Nuclear weapon can increase the National hubris and self-confidence of the possessor, thus emboldening its general international behavior. In the development and maintenance of Nuclear Weapons will consume enormous human and financial resources. Thirty-seven years after the first nuclear explosion, the control of nuclear arms has become the most essential element in American foreign policy. For the first time in history two nations, the United States and the Soviet Union have achieved the means of inflict near instantaneous and Catastrophic destruction on each other and the rest of the world. Several other nations have gained the capability to build and acquire nuclear weapons.

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