INDIA'S NUCLEAR DOCTRINE AND STRATEGY

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The rationale and logic of possessing nuclear weapons as defined by the big powers can be summed up as, first Nuclear weapons have unique and irreplaceable roles in support of national security, and the centrality of this was proven during the cold war and in the recent past. Second Nuclear weapons ensure deterrence and assurance benefits, it is an insurance against uncertainty and the tools to prevent challenges to nation's vital interest; it can also be termed as inducement to restraint.ⁱ Notwithstanding the deterrence the use theories the morality of of nuclear weapons remains unanswered. Third new aspects such as prestige, linkage to escalation control in conventional war and sub-conventional war, religious leadership role have also emerged to justify their possession.

Six issues are essential to determining India's future nuclear doctrine and strategy.ⁱⁱ First, strategic experiences and lessons for the nation, second, the international trends and nuclear dynamics, third, threats to national security and vital interests, fourth, doctrines and strategies adopted by the adversaries, fifth, new technological developments and sixth, what are India's proposed choices or responses. This chapter will enable a reader to study the nuclear deterrencerequirements of India determined by the emerging security situation.

The post- cold war international geo-strategic environment has undergone many strains and changes, the NATO-Russia distrust and tensions are driving the relations southwards, NATO expansion eastwards is the primary cause of the deterioration of the situation, Ukraine was another major flashpoint which strained relations. The deployment of the Ballistic Missile Defence in Europe contributed to Russia responding with counter-measures in the long run, thereby justifying the nuclear deterrent of UK and France. The Terrorism threat and the spectre of Chemical and Biological from non- state actors or state sponsored actors is an additional reason advanced to justify the retention of the nuclear deterrent. This has also resulted in debate over nonstrategic nuclear weapons in Europe and Russia. The modernisation and induction of advanced technological features by the four leading western powers, costing a huge amount will directly and indirectly impact the other states with nuclear weapons, this is the rationale by China in its defence on modernisation of the Rocket Force, which again directly affects India.ⁱⁱⁱ US commitment to its NATO allies and the guarantee of extended nuclear deterrence to Japan and other East Asian allies is interpreted in adversarial terms by an assertive and rising China. Whilst an assurance to allies is a continuation of old guarantees of the Cold War, the emergence of China has changed the equations. China considers USA as the challenger and competitor who would after implementing the rebalancing towards Asia-Pacific endeavor to contain China in the future.^{iv}

The China backed North Korean behavior of irresponsibility and brinkmanship is the most serious development in the past decade, the pace of development of nuclear weapons and ballistic missiles by the impoverished state clearly demonstrates China's support, of course with the aim of destabilizing the International Order.^v In the environment in East Asia and South China Sea, China remains the determinant of how the situation will evolve and under what circumstances will war erupt.In all the situations China will continue to arm itself with better and advanced capabilities.

In West Asia, Syria has joined the list to add to the worsening environment between NATO and Russia. The sectarian divide in the West Asia is now pitting Saudi Arabia and Iran on opposing sides, this sectarian conflict must be factored in Iran's development of nuclear weapon, because it does not having the backing of a nuclear power in the fight against larger forces, however if Iran is cornered the possibility of Russia coming to its aid remains probable, this can set the stage for nuclear rivalry.^{vi} Iran will remain in the race to develop nuclear weapons driven by the competition from the dominant ethnic group in the religion, hence should form part of the calculus because the group has Pakistan as a state with nuclear weapons. This rivalry can involve US, Pakistan, Russia and Iran;a dangerous situation with catastrophic consequences, and as a report some time ago suggested could escalate to involve India.Flash points are emerging in West Asia and North Africa; these too must be viewed with the possibility of big power intervention. The rise of Terrorism across most continents is not in a vacuum, all the weapons and finance are from supporting nations or vested interests.Iraq, Libya, Nigeria, Mali and Afghanistan are problem states which will see power rivalry, may be to the detriment of security.

The security situation globally and more specifically regionally is unstable and continues tothreaten peace, more specifically the situation for India is unsafe and precarious, or as one could term it "never been worse".

In all the turmoil that afflicts the international scenario China puts the onus of international tensions and problems on others, the Defence White Paper of 2015 states "Profound changes are taking place in the international situation, as manifested in the historic changes in the balance of power, global governance structure, Asia-Pacific geostrategic landscape, and international competition in the economic, scientific and technological, and military fields. The forces for world peace are on the rise, so are the factors against war".^{vii} Hiding behind this façade it continues its policy of expansionism with hegemonistic designs. After implementing an offensive agenda it blames others for the complications that arise from its actions, and then takes shelter behind these tensions in the region to bolster its military might including the nuclear forces.

While doctrines and strategies on nuclear deterrence are essentially west driven, the fundamental tenets are applicable to all nations deploying and operationalizing nuclear weapons. The doctrines, strategies, and, size and structures of nuclear forces of states with nuclear weapons continue to develop and evolve to suit their stated or unstated needs and these have a direct impact on our choices in the field. The strategies of Massive Retaliation, Mutually Assured Destruction, Flexible Response or Countervailing Strategy are development of the Cold War period, followed by Tailored Deterrence in the post-cold war period. The strategy of Massive Retaliation by nuclear forces was founded on the premise of stopping a massive conventional offensive by Soviet Union, this lost relevance soon after the Soviet Union became a nuclear power, and it is not the same as adopted by India in 2003. The strategy of Mutually Assured Destruction (MAD) came in post Massive Retaliation, once both powers had enough weapons to destroy each other deterrence was based on the principle that there is no advantage in attacking

the other with nuclear weapons if own survival was not assured, India has decided to adopt Credible Minimum Deterrence which does not relate or amount to MAD. The spectre of total destruction brought in the concept of Flexible Response, where Tactical Nuclear Weapons (TNW) would keep the war localized and not escalate to strategic levels, whilst India at present does not contribute to the view, Pakistan has adopted the strategy, this issue will be analysed later in the chapter. The strategy was not tested till the Cold War came to an end.^{viii} The countervailing strategy was at the strategic plane, and came into operationalization in the late 1979. Russia too followed similar strategies, whilst China announced a policy of no first use and nuclear counter attacks, detailed discussion on China's strategy a little later. US, UK, France, Russia and Pakistan have adopted a doctrine/strategy of first use of nuclear weapons, the circumstances are not defined and therein lies ambiguity, which is an important determinant of deterrence. If these nations have adopted a first use policy or ambiguity to declare their policy there ought to be very valid and vital reasons for their decisions. Deterrence being a psychological subject, it is valid to assume that deterrence by punishment is the better option to safeguard you nation rather than risk destruction by denial and then seek revenge. All the four nations maintain nuclear forces deployed or on alert, the START Treaty between US and Russia allow certain weapons in certain modes with reserves held in non-operational state, the primacy of nuclear weapons is well established in their security doctrines. Further these nations have sub-sets of strategies to support the first use doctrine, eg launch on warning or launch on launch or even unstated pre-emptive launch, these sub-sets allow them to prevent capability degradation and survival. Strategic Stability has been maintained by these nations by the fear of retaliation and the second strike capability, which essentially meant retaining the ability to respond with adequate strike capability under attack or even after absorbing a first strike. First strike allows the first mover advantage, more so against nations with irresponsible and immature political and military leadership. China adopted a No First Use policy after acquiring nuclear weapons, stating it would counter attack with nuclear weapons if any one attacked it with nuclear weapons. The Chinese policy of No First Use will be examined for application later. India too adopted a policy of No First Use, but added that it

may use nuclear weapons against those who use of Chemical or Biological weapons against India.

The nuclear dynamics of the nuclear weapon states has got intertwined so completely and its complexity does not allow decoupling, any move by any of the three leading powers draws a reaction or a spiral effect from the others. Post-Cold War there was a cooling period when there was a downward movement of the arsenals of US and Russia whilst China did not introduce any major weapon or delivery system, however in 21st century, the arsenal and delivery systems of China began to improve and the Russians also introduced new systems and this was followed by US intention to upgrade its nuclear forces. The US has announced modernisation plans, to the tune of more than a trillion \$ in the next three decades. The main systems to be replaced are Minuteman III ICBMs by the new Ground Based Strategic Deterrent (GBSD), development of a new SSBN to replace the OHIO class SSBNs by 2031, induct a new bomber to replace the nuclear capable B-52 and B-2, the new introduction will be the B-21 by 2030's and 2040's, and the existing Cruise Missiles will be phased out, with the induction of the Long Range Stand Off Missile(LRSO).^{ix} The modernisation will also affect the nuclear weapons, both tactical nuclear gravity bombs and warheads on Ballistic Missiles. In addition nuclear infrastructure will be modernized to include Command and Control facilities, new weapon production and simulation facilities. As of January 2016, in the world, there were 4120 operationally deployed nuclear weapons and 5965 are held in storage, of these the US has 1930 and 2750 respectively. The US will maintain a first and second strike capability with the planned modernisation. The US in the last decade has added the Conventional Prompt Global Strike (CPGS) to its conventional deterrence besides testing the X-33, X-47 and X-5, the capability and role/tasks of which are unknown.^x The Ballistic Missile Defence in the form of THAAD has been selectively deployed, and will increase in scope in the future till it protects US from limited threats. The NMD, THAAD, CPGS, hypersonic glide vehicle and ASAT capabilities developed complicate deterrence and strategic stability with Russia and China. However THAAD assumed greater urgency and necessity after North Korea left the NPT and tested nuclear weapons and a series of missiles, at times even dangerously close to Japan and South Korea. China has not reined in North Korea nor exerted to roll back the nuclear programme,

an extended deterrence would have sufficed, therefore it appears it is a deliberate policy decision to destabilize East Asia. Though China continues to profess of not being in competition with US, however its modernisation of nuclear forces points to a contrary view, this will be analysed later in China-India context.

Russia after a period of more than two decades of low emphasis on nuclear modernisation has increased the pace of induction of new platforms and delivery systems. The new inductions are the Borei class of SSBNs and Bulava SLBMs, the RS-24 ICBMs and a new silo based liquid fuelled ICBM RS-28. The TU-95s are being modernized and production of TU-160 will soon resume production. These new introductions carry advanced countermeasures designed to penetrate and overcome the NMD of USA and NATO, and also maintain second strike capability. Russia has deployed 1790 strategic nuclear weapons and holds 2700 in storage, besides this Russia is retaining non-strategic nuclear weapons for deescalation of conventional conflicts, a role reversal from Warsaw Pact days, now that it is conventionally inferior to NATO and USA. Russia also continues to upgrade its BMD and Air Defence capabilities. One can infer a new arms race of a different magnitude is in progress.

The UK has announced the decision to retain four SSBNs with Trident SLBMs with a total of 180 nuclear weapons. A new class of SSBNs will enter service by 2030s. France too will retain a separate nuclear deterrent with aircraft and SSBN delivery systems; it will maintain approximately 300 plus nuclear weapons.

India's current nuclear doctrine provides for a Credible Minimum Deterrent with a policy of No First Use and a strategy of Massive Retaliation to cause unacceptable damage in case of a Nuclear Attack on India or Indian Forces anywhere. India also retains the right of nuclear retaliation in case of large scale Biological or Chemical Attacks and there are guarantees for non-nuclear weapon states. Non-use of nuclear weapons against Non-Nuclear Weapon States(NNWS) 5. Option of use of nuclear weapons in case of major attack by Biological or Chemical Weapons. The CCS also approved continued moratorium on nuclear tests and commitment to a nuclear weapons free world and nuclear disarmament. By releasing these facts to the public which were preceded by the release of the draft nuclear doctrine in

August 1999 India became the only country to spell out in great detail the nuclear doctrine.

The first issue in the CCS approval of the nuclear doctrine was "Credible Minimum Deterrent". The draft doctrine stated that it is a dynamic concept related to **strategic environment, technological imperatives and the needs of national security**. The Credible Minimum Deterrent therefore is a dynamic concept and caters to emerging and existing threats, it is not minimum in size and provides planners the flexibility, space and scope to adjust to the strategic environment and national security needs, and we build our deterrent accordingly. Adversary arsenal size, technological advances, defensive and offensive forces, protection and C4ISR are factors for considerations whilst arriving at the size, delivery means and yield of the deterrent. India correctly chose CMD in 2003, when only blurred contours of one adversary existed and little was known of the other adversary, events since then have validated the concept and provides India the necessary flexibility.

The second aspect of the doctrine is NFU. What the advantages or pros of this policy are, is that NFU is a defensive policy and reassuring globally that India is not an aggressive power. A NFU policy is good for crisis stability especially in a volatile geopolitical region. With NFU policy India will always take a moral high ground whilst seeking nuclear disarmament or a nuclear weapons free world. NFU can be a good policy when the weapon equation is very skewed e.g. China vs India in 1998 or US vs China in the 1960s, the weaker nation has no capability to challenge /cause any damage to the dominant power. It may also be a viable policy when the first use adversary has a very small arsenal and would not cause much damage, and the NFU state could absorb the nuclear strikes and then retaliate. The policy also prevents accidental exchange of nuclear strikes as weapons are not on hair trigger alert. NFU ensures better safety and security since it avoids deployment of nuclear weapons. Confidence Building Measures can be worked better to reduce the chance of a nuclear exchange with a NFU policy. In India's case avoiding of economic sanctions by placating upset powers may have been a reason but probably was not because by 2003 the worst on the economic front was over. The disadvantages of the NFU policy need deliberation. Firstly NFU implies probable large scale destruction in own country, whilst a feeble argument can be made of limited strikes by the adversary on Indian forces in the adversary's territory, there is no guarantee that this is the only possible scenario, on the

contrary if an adversary is to initiate a nuclear war then it must be such that it concludes on his terms ie victory, in such an eventuality the spectre of devastation must be foretold. This may sound alarming or pessimistic but no adversary will initiate a nuclear war only to de-escalate a conventional war fully knowing our policy of assured retaliation. Secondly in India there is hardly any debate on security policy issues much less on the NFU policy, inputs indicate that the Indian public in totality is not in sync with the policy, some call it a cause of concern, others even call it THE PANIPAT SYNDROME of allowing the enemy to defeat us on own soil. Thirdly the nation has not been educated on the devastation of nuclear strikes and is psychologically not prepared to be destroyed. Fourthly to fight a war with constraints which jeopardize the future of a country is also morally wrong; no leadership has the right to place its population at peril without exhausting other options and opting only for NFU. Fifthly NFU policy cannot conduct a first strike on the adversary's counterforce targets, thus allowing the adversary full capability to attrite own capability. In the current environment of mobile system on land and SSBNs at sea the probability of destruction of the adversary strategic assets will be extremely low or negligible in a second strike, this therefore limits own retaliatory nuclear strikes to counter value targets, once again a moral dilemma. Sixthly NFU policy requires a very extensive and elaborate missile defence system across the country, however cost and technology will allow it at select points, leaving the nation exposed to nuclear strikes. Lastly till date we have not witnessed escalation control agreements between nuclear powers and therefore fighting limited nuclear wars without destruction of strategic targets is not a feasible proposition. Our adversaries have progressed rapidly in both 'weapons' and 'delivery means', a first strike will now devastate large parts of India. The older nuclear weapons state has improved and modernized its arsenal and delivery means in the last decade, and if there is a nuclear war, the damage to us will be enormous.

The third policy directive in the nuclear doctrine is "massive retaliation to inflict unacceptable damage", "Nuclear retaliation to a first strike will be massive and designed to inflict unacceptable damage", and India retains the right of nuclear response to biological or chemical attacks. There is no standard definition or interpretation of this term but for NFU let us assume it implies a very large number of counter value targets and whatever counterforce targets detected and identified at the time of retaliation, which results in the ruin of the target nation. It must include important industrial areas, population centres, strategic political centres, command systems/centres and strategic delivery systems. There can be a debate on what constitutes unacceptable damage to an underdeveloped or a developed nation in concrete/physical terms but no nation will survive if a large percentage of its economic power and civil population is destroyed. At times doubts are raised over the strategy of MR, reasons to doubt its applicability are, firstly, gradual escalation / quid pro quo will prevent large scale nuclear damage and is a pragmatic option. Secondly, response to a few or one tactical nuclear weapon should not be disproportionate which could result in an all-out nuclear war. Thirdly, escalation control should be practiced in conventional and nuclear war on moral and humanitarian considerations. Fourthly, the strategy is not rational, our political leadership may not show resolve during crisis or at the time of decision.

Arguments in favour of massive retaliation are first, prevent further damage to India's economic and population centres, second, prevent further strikes on own nuclear forces, third, decapitate adversary leadership to prevent further nuclear exchange, fourth, avoid sudden escalation, there is no guarantee that the adversary will not jump many steps in the escalation ladder to full scale nuclear strikes against a quid pro strategy, fifth, escalation control in nuclear exchange is not feasible as no rules govern nuclear war, sixth, own command and control system may be affected in case of a series of small scale nuclear exchange and therefore not be able to respond, lastly the policy should bring about quick and early war termination.

The Political Council of the Nuclear Command Authority is the authority to order nuclear retaliatory attacks. Procedures for the continuity of nuclear command and control shall ensure a continuing capability to effectively employ nuclear weapons. It would be reasonable to assume that India has a safe, secure, robust, survivable and protected Command and Control system.

After examining the international environment and the future nuclear trends the focus is to now analyse the regional relationship to determine the challenges and policy direction India should adopt.China will remain the main threat to India because of itsillegitimate territorial claims, ideological differences and competition

for strategic leadership in the region. China has kept the border issue in dispute for the past 60 years with no inclination to resolve it; this is a perfect handle with it to generate a rationale to increase tensions. The next main reason for conflict of interest will be ideological differences due values of democracy, human rights, rule of law and respect for international order and laws. On all these issues China violates norms and its behavior can be characterized as anti-order. China has embarked on expanding its sphere of economic trade and influence through loans to subjugate small nations by creating a crisis of payment, further China is creating new military bases in the Indian Ocean. All these actions point to the future trends that may unfold as China seeks to become a hegemon in Asia. China has perfected the art of coercive diplomacy and its aggressive behavior is justified by distorted historical facts as it grows its military power.

In the past two decades China has conveyed its defence and military strategy through the medium of Defence White Papers, demonstration of capabilities through technological achievements and reforms and reorganization of the security system. The latest Defence White Paper of 2015 indicates the focus on its ambition of international prowess. The dream of achieving greatness is sought to be achieved through economic and military power, and in military thought the offensive intent is couched in defensive content, ie the concept of ACTIVE **DEFENCE** "The strategic concept of active defense is the essence of the CPC's military strategic thought. From the long-term practice of revolutionary wars, the people's armed forces have developed a complete set of strategic concepts of active defense, which boils down to: adherence to the unity of strategic defense and operational and tactical offense; adherence to the principles of defense, selfdefense and post-emptive strike; and adherence to the stance that "We will not attack unless we are attacked, but we will surely counterattack if attacked."China's emphasis on local wars relates to its periphery and the inference is that East Asia and India are the areas of focus.

China's Nuclear Deterrence and PLARF role and missions are stated as in the CDWP 2015 "The nuclear force is a strategic cornerstone for safeguarding national sovereignty and security. China has always pursued the policy of no first use of nuclear weapons and adhered to a self-defensive nuclear strategy that is defensive in nature. China will unconditionally not use or threaten to use nuclear weapons against non-nuclear-weapon states or in nuclear-weapon-

free zones, and will never enter into a nuclear arms race with any other country. China has always kept its nuclear capabilities at the minimum level required for maintaining its national security. China will optimize its nuclear force structure, improve strategic early warning, command and control, missile penetration, rapid reaction, and survivability and protection, and deter other countries from using or threatening to uses nuclear weapons against China"2015.^{xi}

When compared with India there is no clarity of what China means with respect to no first use of nuclear weapons, India clearly states that it will retaliate only after nuclear strikes on India or its forces anywhere, whereas China can interpret in any manner. The statement "…has always pursued the policy of no first use ….." is vague since it is past tense without continuous tense, and the statement on non-nuclear weapon states does not apply to India it being nuclear weapon state. Thus it can be deduced that China retains the doublespeak stance on issues where it can use either interpretation. *If it can reject the legal INTERNATIONAL COURT of JUSTICE ruling so too can it not abide by its own policy, which is not binding being a self-declaratory policy.*

Some PLA officers have written publicly of the need to spell out conditions under which china might need to use nuclear weapons first; for example, if an enemy's conventional attack threatened the survival of china's nuclear force or of the regime itself. Press accounts suggest that china may be enhancing peacetime readiness levels for these nuclear forces to ensure responsiveness. PLA writings express the value of a "launch on warning" nuclear posture, an approach to deterrence that uses heightened readiness, improved surveillance, and streamlined decision making processes to enable a more rapid response to enemy attack. These writings highlight the posture's consistency with china's NFU policy, suggesting that it may be an aspiration for china's nuclear forces.

One key document that describes China's declared strategy is the Science of Second Artillery Campaigns and states the new task of "<u>dual deterrence and dual</u> <u>operations</u>" and set up a new conventional guided missile force. The basic logic of "dual deterrence and dual operations" was that both conventional and nuclear missile capabilities could deter China's adversaries, while both conventional and nuclear operations were necessary in wartime.^{xii} By nuclear operations, the PLARF refers to nuclear counter-attack and nuclear deterrence operations(US REPORT).

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<u>The 2015 White Paper states "The</u> PLA Second Artillery Force (PLASAF) is a core force for China's strategic deterrence. It is mainly composed of nuclear and conventional missile forces and operational support units, primarily responsible for deterring other countries from using nuclear weapons against China, and carrying out nuclear counterattacks and <u>precision strikes with conventional missiles.----The PLASAF capabilities of strategic deterrence, nuclear counterattack and conventional precision strike are being steadily elevated. If China comes under a nuclear attack, the nuclear missile force of the PLASAF will use nuclear missiles to launch a resolute counterattack either independently or together with the nuclear forces of other services. <u>The conventional missile force is able to shift instantly from peacetime to wartime readiness, and conduct conventional medium- and long-range precision strikes.</u>"</u>

The White Paper on Defence of 2015 does provide indicators and trends the PLA Second Artillery Force (PLASAF) now renamed Rocket Force in 2016, will take in the near future, to quote "In line with the strategic requirement of being lean and effective and possessing both nuclear and conventional missiles, the PLA Second Artillery Force (PLASAF) will strive to transform itself in the direction of informationization, press forward with independent innovations in weaponry and equipment by reliance on science and technology, enhance the safety, reliability and effectiveness of missile systems, and improve the force structure featuring a combination of both nuclear and conventional capabilities. The PLASAF will strengthen its capabilities for strategic deterrence and nuclear counterattack, and medium- and long-range precision strikes".^{xiii}

At the inaugural ceremony of the PLA Rocket Force on 31 December 2015, Xi Jinping reportedly told the assemblage that the mission of this new service is to "…enhance credible and reliable nuclear deterrence and counter nuclear strike capability……a fundamental force for our country's strategic deterrent, a strategic pillar for our country's great power status, and an important cornerstone in projecting our national security".^{xiv}

Three roles of nuclear deterrence, nuclear or conventional precision strikes and A2AD are clearly in the domain of PLARF, the mix of nuclear and conventional missiles and role complicate the target selection and intent discernment, a typical Chinese trait of assassin's mace.

China's nuclear forces modernisation has witnessed substantial improvements in the navy and land missile capabilities in the PLARF. The SSBN programme has fructified, and now four SSBN in the type 94 class are now operational and one is under construction, it has 12 x SLBMs of the 7200 km range in each SSBN, the triad is now fully deployed. The modernisation of the land segment has seen the replacement of silo based fixed missile to a road mobile ICBM the DF-41 and DF-31A, and even development of MIRV on the former missile. The greatest increase has been in the shorter range road mobile Ballistic Missiles ie DF-21range 1750-2100 and DF15/16 range 600/800-1000 km respectively, and these can cover India and East Asia, the CSS-(DF-26) ballistic missile with a range of 4000 km goes beyond India and Japan. The technological prowess of China is now being demonstrated by new capabilities being developed in the cruise missile CJ-10 the ground-launched cruise missile (GLCM), with a range in excess of 1,500 km. The A2AD strategy required manoeuvrable missiles and this has been demonstrated in the Anti-Ship Ballistic Missile these are the CSS-5 (DF-21C &D)(MRBM), the conventionally armed CSS-5(DF-21D) anti-ship ballistic missile (ASBM) with manoeuvrable capability to attack ships, including aircraft carriers, in the Western Pacific Ocean and Bay of Bengal. This manoeuverable feature will also be found in future land attack missiles introduced or in the replacement missiles. Precision strikes are the key words China uses while describing its conventional missile strikes, roughly these can be equated with US Global Prompt Strikes, where strategic targets are addressed conventionally, ranging from nuclear assets to Command & Control systems, this important development should be an important determinant for counter measures. China's research in Hypersonic vehicle technology has borne fruit, this will complicate the deterrence calculus as it seeks to overcome the BMD, be it US or India. The SSNs are now adding might to the PLAN as it seeks to dominate the open seas. The induction of new technology delivery systems will continue with time and note must be taken of the emerging technologies.

Space based assets form the crucial links in Command, Control, Communications, Computers, Intelligence, Information, Surveillance and Reconnaissance (C4I2SR) for real time situational awareness and passage of commands besides a host of other actions and activities. The Chinese have demonstrated their prowess of anti-satellite (ASAT) capability in 2007, this is an ominous development making space

based assets vulnerable. The A2AD system has put in place a series of satellites and Over the Horizon Radar (OTH) to synergise the forces of A2AD. The array of satellites deployed as part of Anti Access Anti Denial (A2AD) strategy can be expanded and used against India at any time; the expansion of the constellation is a natural action. The requirement of a new long range modern Bomber is believed to be under development, to replace the H-6, which does not provide the requsite range or air defence penetration capability.

According to the US-China Economic and Security Review Commission, the PLARF2 "has at least 1,330 and potentially more than 1,895 ballistic and cruise missiles, which includes 1,000-1,200 short-range ballistic missiles, 75-100 medium srange ballistic missiles, 5-20 intermediaterange ballistic missiles, 50-75 intercontinental ballistic missiles, and 200-500 ground-launched land-attack cruise missiles." 3 .^{xv}

It is estimated that China possesses 300 nuclear weapons and may be even greater number, the official numbers are never disclosed, and the holding of weapon grade fissile material gives it a far greater capability. In the absence of transparency it may be difficult to predict the number of nuclear weapons on ballistic missiles below the ICBM category, these form the core against India, Japan and South Korea. The Rocket Forces, are a combination of nuclear and conventional missiles, the large number of conventional missiles in the Chinese inventory, give it a deep and flexible capability to conduct saturation strikes on most areas of North and Central India, this counterforce and counter strategic targets capability can provide it with a psychological advantage besides the military edge. The SSBN force now entering service, can from the safe water of East China Sea and South China Sea target anywhere in India. In the nuclear forces China has had a head start in the weapons, delivery systems and modernization, whilst catering for the threat from super and regional powers it still has a formidable nuclear capability against India. The nuclear forces deployed at the two bases in North TAR and East of TAR are both equipped with nuclear missiles capable of targeting only India, the other longer range missiles at bases at the centre and east of China are capable of addressing targets in India. The modernization programme has made the missiles mobile and manoeuvrable to give them better and greater survivability, flexibility,

dispersion, camouflage and concealment. These have enhanced the second strike ability and reduced the time of strikes and retaliation.

China has started its naval forays into the Indian Ocean and building of naval bases, this militarization of the IOR will directly challenge India and the SLOC energy routes. The acquisition of a base at Djibouti and joint development of facilities at Myanmar and Sri Lanka, buying of an island at Maldives and the CPEC linked with the construction of the Gwadar base at Pakistan are moves which have portents of danger to India. Therefore it is very evident that The PLAN is now in the process of developing maritime power as stated in the Defence White Paper. China continues its quest to develop a modern fighting force, the defence reform announced on 31 December 2015 have created new structures and elevated the nuclear forces to the status of the three armed forces whilst simultaneously creating a Strategic Support Force, possibly with Cyber and Space Domains at the core, these changes along with the creation of Five Joint Commands allows China to plan its operations akin to the US power projection capabilities. The growth of China's defence industry allows it to develop weapons and platforms that suit the adopted strategy and also undertake reforms to give substance to the doctrines and strategy required for future wars

Pakistan claims that its nuclear weapons programme is to contend with "threats" from India and never to allow a repetition of situation like the creation of Bangla Desh. The Pakistan rationale states to "counter Indian Conventional Military superiority", Pakistan must link conventional escalation to nuclear deterrence. The key policy goal of Pakistan's nuclear weapons capability is to deter Indian conventional as well as nuclear aggression.⁷ Its secondary policy goal, if deterrence fails, is to deny India victory in the event of a war.

The nuclear development programme has been aided and assisted by China, their collusive partnership has helped Pakistan overcome many difficult situations.^{xvi} Pakistan has approximately 130-140 nuclear weapons currently and is the fastest growing nuclear warhead arsenal in the world and by 2020 it may reach a figure nearly double of its current holding, based on the fissile material it is producing at Khushab Reactors, and for the next 30-40 years this figure will likely increase by 25-30 weapons per year at current capabilities, and more if the plutonium production increases. The earlier Chinese transfer of missiles and missile technology had paved the way for successful induction of nuclear capable ballistic missiles, not only covering India but now Israel also. Pakistanhaswell established missile production centres and produces enough missiles to more than match the

weapons operationalized. The air delivered vectors are advanced in their capability whilst the naval sub-surface capability is in the final stages of testing.

Pakistan now possesses ballistic missiles from 60 km to 2750 km ranges (Nasr, Abdali, Ghaznavi, Ghauri, Shaheen 1, 2 and 3, cruise missiles for land and aircraft with the naval version under development), two types of aircrafts inservice are nuclear capable. The creation of the Naval Strategic Forces and modification of conventional submarines with Nuclear tipped cruise missiles is in the direction of second strike capability and complicating deterrence. The missile growth of Pakistan now covers the whole of India including the Andaman and Nicobar Islands, a justification by Pakistan strategist for the Shaheen 3 missile with a range of 2750 km. All this gives it a formidable capability with more than 130 nuclear weapons. The only target country is India unless Shaheen 3s are targeted at Israel. Pakistan is now concentrating on Tactical Nuclear Weapons(TNW) to prevent a conventional conflict with India. The development of TNWs is directed at India and indirectly at the world, by scaring the international community, Pakistan anticipates that the world will council restrain on nuclear escalation if the terror is exports escalates to conventional war further in danger of escalating to the nuclear domain, but does not want to export terror emanating from Pakistan. The modernisation of missile systems which China is undertaking are expected to be replicated by Pakistan.

Pakistan has adopted a Full Spectrum Deterrence Doctrine (FSD), which was stated in the ISPR release of 2013 after the testing of the short range NASR tactical nuclear weapon delivery missile. The essence of FSD is that Pakistan has deterrence against its prosecution of proxy terror war against India, in case the subconventional conflict escalates to a conventional war Pakistan then uses Nuclear deterrence to de-escalate the conventional war by threat of nuclear escalation, the first step being use of TNWs, in the event of conventional war linked deterrence failing the concept of Total War being implemented through Comprehensive nuclear escalation. Therefore it can be said that Pakistan has adopted a doctrine tolink nuclear deterrence with conventional escalation \$\$\$. " A security analyst, maintains that Pakistan's existing capabilities fit well with its doctrine aimed at ensuring nuclear deterrence. Nuclear weapons of all descriptions in the Pakistani arsenal are meant to provide what is officially described as full spectrum deterrence. Tactical nuclear weapons are meant to deter any shallow Indian thrust at the lowest level of engagement, within the framework of the so-called Cold Start Doctrine / Pro-Active Operations. A second strike capability is being developed by equipping the conventional submarines with

<u>nuclear-tipped ballistic missiles. Cruise missiles are being developed to beat</u> <u>the Indian BMDs."^{34\$\$\$}xvii</u>

Pakistan has not only adopted FSD and First Use; its nuclear signaling is symptomatic of brinkmanship. Often its political leadership is habituated to make irresponsible statements on use of nuclear weapons to defend itself. The brinkmanship is designed to scare the international order and project itself as the weaker power in search of protection through intervention by world powers. The operationalization of the TNWs has now put Pakistan on the strategy of nuclear warfighting vis-a vis strategic deterrence India has adopted. The implications of nuclear warfighting will be examined later whilst discussing the role of TNWs.There remains a doubt if the sub-conventional domain covers the eventuality of the adversary foisting sub-conventional war on Pakistan, will the deterrence be established. Another concern that needs examination is "will Pakistan extend the deterrence to Saudi Arabia its financial backer and with that will the so called Islamic Nuclear Umbrella be targeted at Israel. If this concern were to come true the situation will become extremely complicated and dangerousIt will be prudent for Israel and affected countries in West Asia to factor this equation when planning future threats and take measures to counter the capability.

The nuclear strategy Pakistanis of "first use", with the red-lines thatare indicative in nature and have enough ambiguity to prevent very clear cut definition. The policy of first use is mandatory if Pakistan is to link nuclear escalation to conventional war. This policy was adopted by NATO to overcome the conventional superiority of Warsaw Pact, Pakistan is following suit to negate India's conventional superiority. Some analysts state that two constants in Pakistan nuclear doctrine are first use and unilateral moratorium on testing and two variables are Minimum Credible Deterrence and De-mated posture. Tracing ...<u>diversification of delivery means also indicates a shift from massive</u> <u>retaliation to graduated response, coupled with changes in future targeting</u> <u>strategies</u>. &&&

The situation has been further complicated by the development of Tactical Nuclear Weapons to deter offensive conventional deep penetration by Indian Forces. The dangers associated with TNW are well documented; the delegated power lowers the threshold and introduces instability on nuclear deterrence. The issues of a huge arsenal to counter mobile forces, security in the war zone and their conventional targeting by the adversary, radiated homeland, and most important escalation control are inherent dangers of fielding TNWs ###.<u>Pakistan has also tested the Hatf IX SRBM (also called Nasr) in order to "add deterrence value to the state of the state...</u>

<u>Pakistan's strategic weapons development program at shorter ranges."²⁸ Nasr</u> missiles are meant to deter a proactive but limited military strike by India against Pakistan. Change is also fairly obvious at the doctrinal level. With the introduction of Nasr missiles as a response to the threat of India's proactive military operations doctrine, <u>Pakistan has effectively lowered the threshold of its nuclear use</u> <u>option. At the same time, it has also moved away from massive retaliation to a</u> <u>flexible response.³⁰</u>

The development of the sea leg of the triad will provide Pakistan a second strike capability from the sea, while the endurance of the submarine may pose dilemmas of deterrence patrol areas unless close to Pakistan coastal waters, it will be athreat in being to West India. Pakistan has not declared the nuclear weapon equipped submarine operational but as and when it does so, it will have to change the demated status of its nuclear forces. It is also expected that Pakistan might, in the near future, **perceive a need to move away from the nondeployment of its weapons**. **Its evolving sea-based capabilities, as well as its short-range ballistic missiles** (SRBMs), may also necessitate a shift from centralized to delegated command and control."&&& Zafar Nawaz Jaspal, a Pakistani defense analyst wrote, "Pakistan's nuclear posture might shift from declared, recessed deterrence to active deterrence, which entails an ambiguous state of hair-trigger alert."³¹ Pakistani officials have refrained from stating the official position. However, the above-mentioned developments might increase the likelihood of a change in posture.

The possibility of change in nuclear thresholds and targeting are on the anvil as deduced from its actions of the recent past. "First, Pakistan appears to be amending its nuclear threshold and response options. Pakistan has tested and developed the Babur land attack cruise missile, which has a range of about 700 kilometers, in response to India's BMD capabilities. Likewise, the Ra'ad air-launched cruise missile, with a range of 350 kilometers, has reportedly been developed to provide Pakistan with "strategic standoff capability on land and at sea" that would neutralize India's growing military capabilities.27

With the introduction of Shaheen 3 missile there also appears a change in targeting philosophy as indicated by the response on the utility of the missile. On March 9, 2015, Pakistan's Inter-Services Public Relations agency announced the "successful test launch of Shaheen III surface to surface ballistic missile, capable of carrying

nuclear and conventional warheads to a range of 2,750 kilometers."¹ Responding to a question about the rationale for testing the Shaheen III missile, adviser to Pakistan's National Command Authority Khalid Kidwai said the Shaheen III missile is meant to reach India's nascent strategic bases on the Andaman and Nicobar Islands.² The purpose is to denv India a second-strike capability.³ "ISSI" .^{xviii} The introduction of Shaheen III, a longer-range ballistic missile apparently meant to target the Andaman and Nicobar Islands, and a short-range ballistic missile, Nasr, may entail another change in Pakistan's targeting strategy, which has long been focused on countervalue targets, to a combination of counterforce targets and countervalue targets.

Significant efforts are also being made to develop an effective sea-based deterrent. In addition to these developments with delivery vehicles,

Increase in Pakistan's arsenal and the rapid pace of increase indicate that Pakistan is in an arms race and seeks strategic balance with India, whilst this is not noticeable in India's nuclear arsenal. The BMD that India seeks to develop is for veryfocused use due its policy of No First Use, to ensure survival of the leadership, whereas yhis is totally misinterpreted by Pakistan analyst and policy makers. The development of MIRVs by Pakistan will definitely complicate deterrence, the development on the incorrect premise of India's BMD will have its fallout on deterrence stability. Pakistan is constantly increasing its fissile material stockpile to meet the growing requirements of its arsenal.²⁹ From its official perspective, these are necessary because of India's growing investments in destabilizing technologies like BMD and its aggressive doctrinal changes, which allow for proactive military operations inside Pakistan's territory. Moreover, the development of warheads with multiple independent reentry vehicles (MIRVs) is also reportedly being contemplated to strengthen the credibility of Pakistan's nuclear deterrence against India's prospective BMD

Pakistan falsely believes that it has a Politico-Moral Authority to use nuclear weapons in self defence if a superior country threatens it or its existence. An argument such as this is not only flawed but dangerous because many other nations will use the premise to make nuclear weapons to challenge adversary(s) of superior strength. This thought has been used by Pakistan for sabre rattling by the political

and diplomatic fraternity when relations between Indiaand Pakistan worsen. (2157 WORDS)

Thus in the final analysis it can be stated that all developments in China doctrinal, strategic or technological have a bearing on India, past experience analysis shows that India's neglect to take decisive action resulted in low capabilities and being kept out of reckoning on the international stage. Avoidable but inevitable is Pakistan taking steps to match and maybe move ahead of India, fully in the know that India needs to respond to China's modernisation. India's NFU does not affect Pakistan's nuclear weapons developments, because these are driven by the desire to remain ahead of India and also due to the support provided by China. At the Fissile Materials Cut-off Treaty discussions, whilst Pakistan blocks the consensus, the behind the negotiations backing of China is evident. Even on the issue of India's joining the United Nations Security Council, China has been inflexible, whereas India had played a positive role in China's entry to UN and UNSC in place of Taiwan, the basic approach is to keep India limited to South Asia and embroiled with its proxy Pakistan. This approach to restrict India in the India-Pakistan equation fits well in the non-recognition of India as a Nuclear Weapon State. Though India now possess a formidable nuclear arsenal, China does not accept the reality which even USA has agreed to through the Nuclear Deal, not only that, to deny any recognition to India as a nuclear weapon state China does not wish to engage with India to discuss confidence building measures (CBMs). (2409 WORDS)

The key lessons learnt by India in the past six decades with regard to nuclear deterrence, doctrine, strategy and development of nuclear weapons are, first late or delayed action puts the nation at a great disadvantage then and for all times to come in the foreseeable future, second the development and operationalization of the deterrent is a time consuming process,three the cost always seem beyond reach because of conflicting requirements of the nation. The decision not to go nuclear after China humiliated India in the 1962 Border War and China's nuclear weapon test in 1964 will continue to haunt the Indian Political and Military leadership, after missing the chance, India stands excluded from the nuclear haves of the NPT. The exclusion of India from the nuclear high table denied it place in nuclear forums such as NSG, MTCR, AUSTRALIA GROUP and other important International

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institutions, and denial of raw materials and technology. The decision to further delay weaponisation after the 1974 test resulted in India not developing its doctrine and strategy till 1998, losing a quarter of a century in which the Political and Military leadership could have developed its deterrence mechanism holistically whilst Pakistan did not have any nuclear weapons and China too was improving its arsenal and command & control systems. If India had weaponized in 1974, maybe the world powers could have prevented Pakistan acquiring nuclear weapons, and the world would have been a safer place. The lost time also prevented the growth of the arsenal during those years and delay in commencement of the ballistic missile programme. Whilst it is not politically correct to criticize the past decisions, the important point is, national security guidance and decision making must take into account the lessons of the past to the pitfalls of the past and guide future actions. It is now for the present and future leadership not to put the country in a disadvantageous position hereinafter and take decisions with wisdom, sagacity, astuteness and vision.

This chapter seeks to analyse the issues that India should address while enunciating its nuclear policy and doctrines/strategy of the future, driven by the rapidly changing environment, and in doing so must first evaluate the existing doctrine and strategy and determine if it meets future needs or requires change or modifications.

The future doctrine and strategy is linked to the existing and future relationship of India-China-Pakistan nuclear triangle, and this is an unstable relationship and the distrust in the triangle creates its own complications, however this relationship does not function in isolation but is also determined and subjected to the international geo-political environment. The fact that more nations get linked indirectly or directly to the nuclear triangle must be part of the determinants of the future policy.

Wisdom drawn from the past 20 years of experience post Pokharan Nuclear Tests in international relations and security strategies should convince Indian National Security Strategy makers not to live in a make believe world, where your adversary is expected to tow a moral path and abide by rules of yesteryears, and behave in the way India expects. National Interests will drive the policies of the adversaries, which often will cross purposes with Indian National Interests, not only posing direct military threats but also undermine the political, economic, social and internal cohesion of the country.

Geo-strategic, geo-political and geo-economic domains are now interlinked now as never before, these will often determine the course of events, and to ensure that India does not stand at a disadvantage, our future policies and strategies must cater for proactive defence, to save it from the quagmire it found itself in or embarrassments of the past eg NPT, NSG, CTBT or FMCT.

Therefore the primary responsibility of the state is to ensure the survivability of the state and the people of the state, which should be interpreted as protection, safety, defence and safeguard all that the state stands for in international and domestic policies/principles. Any abdication or dereliction or non-adherence to the principle of survival of the state is in contravention of the constitution of India. The damage to the state should be only by those enemy actions which cannot be prevented in spite of own capabilities and preventive measures. In order to protect the state all policies must ensure proactive actions to remain in escalation control and dominance, and if required pre-emption, of course subject to very accurate intelligence.

On the doctrinal side India should favour placing itself in the initiative seat rather than reacting to the adversaries. The policy adopted should be assertive andpreemptive to ensure escalation control in any crisis and in the worst case of war. The moral high ground often spoken of to defend past policies does not exist in the International Order, it is time to jettison antiquated ideas and relate to modern theories where survival of the state is the primary responsibility of all actions by the State. Arguments related to decisions of other countries cannot form the basis of policy making and judgements. Based onthis logic and rationale the **Indian doctrine and strategy will be determined by:-**

- Doctrine to ensure survival of state and strategic stability
- <u>Deterrence aimed at the adversary's vulnerability</u>
- <u>Develop technological responses to offensive strategies of our</u> <u>adversaries.</u>
- Placing high cost on the adversary's in case of nuclear attack on India

- <u>Demonstrate resolve and credibility thru capability and in the worst</u> <u>case react with employment of unacceptable magnitude</u>
- <u>Retain escalation control and demonstrate the capacity for escalation</u> <u>control.</u>
- <u>Cater for and negate any brinkmanship by adversary(s)</u>
- Ensure balance of power with both adversaries
- <u>Assure India that risks associated with its national security are</u> addressed through capability.

India has to contend with two nuclear adversaries, one the proxy of the other and the two with differently stated doctrines. However China has never abided by what it says therefore it will be prudent for India to believe that China may use nuclear weapons first when confronted with reverses.

Doctrinally India should adopt apolicy of ambiguity on the employment of nuclear weapons, the present no first use policy is flawed, as it is contrary to the principle of protection of the State which is to be ensured by the Government and the State. In war surprise and uncertainty are fundamental principles to keep the adversary conjecturing on the future actions, a declaratory policy of NFU is a formula for disaster. Strategic Stability may be ensured by NFU in a crisis situation but not during war. It is incumbent that India should follow a policy of First Use to defend the country from destruction and ruin Whilst it is not necessary to announce FIRST USE, however it is important to withdraw from the NO FIRST USE and shift to ambiguity is not to state its position on the NUCLEAR WEAPONS USE policy. Ambiguity also provides four options ieof first use ie pre-emption, launch on warning (LOW), launch on launch(LOL) and NFU. Pre-emption gives the choice of time, targets and scale to the initiator and will pay the best dividends to safeguard the nation but it is also the most destabilizing if announced to the adversary, but better than NFU. The options of LOW has most first use advantages except there is a small window of opportunity for its execution, it depends on fine political judgment, but ensures protection of the country, and causes damage to the adversary's leadership, arsenal and strategic targets. LOL is dependent on real time surveillance and intelligence, has an extremely small window of a few minutes for decision making, with a very large number of nuclear weapons on hair trigger alert, and is destabilising. A policy of ambiguity must be adopted, as it includes four

options including NFU. The advantages include, deterring first strike on India, even if it is destabilizing with China, Pakistan already follows it, and four other nuclear weapon states have a similar policy. It has a positive impact on the psychological state of the nation, a proactive policy is reassuring to the public. First use does not allow destruction of the nation and strategic forces at the commencement of nuclear war, hence all the weapons and delivery systems are intact for use. It affords a superior range of options to launch decapitating and/or disarming strikes to deal with the adversary leadership/arsenal, and allows a proactive CBM policy. **The change from NFU to ambiguity will require better surveillance and monitoring systems, real time intelligence, high alert state of nuclear forces during crisis/war, better and faster readiness state in peace. &&&&force 2014. Any First Use policy must also include a strategy to negate the adversaries second strike capability to the maximum extent by adopting a damage limitation strategy, this may entail a bigger arsenal but it is worth the cost to protect the nation.**

While defining the concept of deterrence there is a need to remain ambiguous, from the present Credible Minimum Deterrent the need is either to eliminate the statement or change to Credible Deterrent. The size of the deterrent is only one aspect to determine the overall form, technological features and a host of other characteristics decide the deterrent form. The targeting philosophy must be a mix of counterforce and countervalue to retain flexibility in choice and also to enhance deterrence, there should be no moral argument in nuclear war. The unthinkable will always and every time be the final step, hence when left with no other option the option must be total destruction to terminate the war. These are time consuming steps and capabilities but allow decision makers better and greater choices to safeguard the nation.

India must continue to follow Strategic Deterrence in conformity with the role it has defined for its nuclear weapons. The concept of nuclear warfighting is flawed and based on wrong premises that nuclear war is controllable and escalation control is feasible amongst adversary(s) with deep rooted hatred and distrust. Strategic Deterrence can follow a policy of first use when there is an unstable and unpredictable adversary, thereby eliminating the dilemma of responding to battlefield weapons or having to qualify circumstances of use with No First Use. From the above it is necessary that strategies and supporting systems that complement first use policy must be implemented and made functional on ground. The basic requirement is to have an assured capability of intelligence, surveillance and reconnaissance to detect, identify, track and destroy nuclear assets of the adversary. This capability must be real time, day and night, all weather and multimode to make it fool-proof. The ISR capability allows the employment of nuclear weapons at the right time and place to ensure the ends are met for national security. The Command and Control too must be state of the art with continuous improvement and modernisation. The tenets of survivability, protection, responsiveness, security and safety will continue to form the central belief of our Nuclear Doctrine.

To support the doctrine the TRIAD in the expanded form should be operationalized, part of which is operational currently. The expanded TRIAD will have two additional legs ie robust Infrastructure and Defensive Sytems. The New Triad was part of the US Nuclear Posture Review in 2001, it has three major elements: offenses, defenses, and infrastructure. Offenses comprise nonnuclear and nuclear weapons and their delivery means (cruise missiles launched from submarines, for example), as well as capabilities for offensive information operations (such as electronic attacks and computer network attacks).6 Nuclear strike capabilities include strategic nuclear forces (SLBMs, ICBMs, and bombers), as well as shorter range, nuclear-capable strike aircraft based on land and nucleararmed cruise missiles launched from attack submarines.7 Defenses encompass active defenses, passive defenses, and defensive information operations. Active defenses intercept ballistic missiles, cruise missiles, and strike aircraft. Passive defenses protect against missile and air attack by means of concealment, hardening, redundancy, warning, dispersal, mobility, and other measures.8 Defensive information operations counter attacks on critical information systems. Infrastructure is the aggregate of the labs, plants, and workforce that develop, build, maintain, and modernize the other elements of the New Triad. This includes both the nuclear weapons complex and the defense-industrial base that produces delivery platforms, weapons, sensors, communications systems, data processors, and other items needed for offensive strikes and defensive protection. The three elements of the New Triad are tied together by command and control, intelligence, and planning capabilities. Command and control-including communications links

among decisionmakers, command centers, and operational forces—enables the authorized, combined, and effective use of offenses and defenses. Intelligence is essential for characterizing threats, devising deterrent strategies suited to specific adversaries, discovering enemy vulnerabilities, targeting strike capabilities, and providing the warning needed to increase the readiness of offenses, defenses, and infrastructure. Peacetime planning is needed for the integrated and balanced development of the different capabilities of the New Triad and the preparation of coordinated plans for attack options, defensive operations, and infrastructure activities. Realtime, adaptive planning allows strike capabilities and defensive systems to respond to the unanticipated exigencies of actual crises and conflicts.



SOURCE REFERENCES (6 Information operations are discussed in Joint Chiefs of Staff (JCS), Joint Doctrine for Information Operations, Joint Publication 3-13 (Washington, DC: JCS, October 9, 1998), available at http://www.dtic.mil/doctrine/jel/new_pubs/jp3_13.pdf . Electronic attack is "the use of electromagnetic energy, directed energy, or antiradiation weapons to attack

personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability." Computer network attack involves "operations to disrupt, deny, degrade, or destroy information resident in computers and computer networks, or the computers and networks themselves." The two types of attack are distinct. For example, "sending a code or instructions to a central processing unit that causes [a] computer to short out the power supply is [a computer network attack]. Using an electromagnetic pulse device to destroy a computer's electronics and causing the same result is [an electronic attack]." JCS, Department of Defense Dictionary of Military and Associated Terms, Joint Publication 1-02 (Washington, DC: JCS, May 7, 2002), available at http://www.dtic.mil/doctrine/jel/new_pubs/jp1_02.pdf. 7 Annual Defense Report to the President and the Congress—2001 (Washington, DC: GPO, January 2001), pp. 9193, available at http://www.defenselink.mil/execsec/adr intro.html. 8 Active and passive defenses are defined in JCS, Joint Doctrine for Countering Air and Missile Threats, Joint Publication 3-01 (Washington, DC: JCS, October 19, 1999), available at http://www.dtic.mil/doctrine/jel/new pubs/jp3 01.pdf.)

The nuclear weapons and delivery Triad should be heavy in land and sea vectors and the air vector must be small, the reason for a small air vector lies in the absence of a long range bomber with stealth capability, even with cruise missiles the current fighter-bombers will not be able to pose the desired threat at one of the adversary. The delivery range of land and sea based missiles should cover the entire land mass of the adversary(s) and certain sea zones where its forces can be deployed ie islands and sea deterrence areas. Road and Rail mobile missiles provide survivability, security and improve assured retaliation, hence must form the backbone of the land vector. Longer range missiles must constitute the bulk of nuclear forces, with better penetration technologies. Bigger SSBNs are required to carry more missiles with longer ranges; the progress in this field should be priority for India.

<u>India should</u> develop MIRV capability earliest, miniaturization of warheads is importantto increase the MIRV capability, MIRV provides the ability to increase the number of targets destroyed by one delivery vehicle, with the benefits to overcome missile interception defences, deliver multiple warheadson a single missile thereby reducing the number of delivery missiles .On the converse the disadvantage of MIRV single delivery missile loss does worry planners with small arsenals. MIRVs also complicate the strategic calculus. Manoeuvreable Re-entry Vehicles(MaRV)are required to overcome missile interception defences, ensure assured strike and to improve deterrence by ensuring mutual vulnerability.

Hypersonic technology has now reached testing phase and will be deployed very soon by some developed nations, India too should plan to deploy hypersonic vehicles once our scientists are able to prove the technology.Hypersonic delivery vehicles will provide shorter delivery time and also overcome the missile defences of the adversary. Besides the faster delivery systems India also needs long range faster cruise missiles to add to the capability, these will help achieve better results and add to deterrence.

Earth penetrating Weapons (EPW) systems to address targets deep underground or in mountain terrain are the need as protective systems move deeper and get reinforced. It is important to expand the range of targets and EPW provide that capability.

To ensure technological parity if not superiority future development required include improved guidance systems, accuracy in targeting provides the assurance of desired results. Technological advancement is also mandatory in developing penetration aids to overcome missile defences or other interception means and to achieve higher kill probability.

New Directed Energy Weapons now in the realm provide for better protection in the future, India should focus on these in large measure.

Space based systems are needed for Ballistic Missile Defence and C4I2SR, and greater the redundancy the higher the chances of survival. In the space domain antisatellite capability is needed to protect own C4I2SR capability and deny it to the adversary when desired, This subject needs immediate attention by India due its critical necessity in any future crisis or military operation.

Strategy of Prompt Global Strike have given the ability to target nuclear assets or Command &Control facilities with conventional ballistic missiles, India should invest in this capability, in any future conflict one grey area will be response to attack on nuclear assets with conventional weapons, a dilemma Pakistan will face in the future.

India had announced a self-moratorium on future testing of nuclear weapons but there is a need produce better and more efficient nuclear weapons through computer simulation,

The yield of weapons must be constantly reviewed to remain commensurate with the target and desired damage as and when target reviews are conducted and strategy evaluated. The weapons in the arsenal must all be in the thermonuclear range, which deliver the yield optimized by technical and strategic planners the world over, a majority of weapons today lie in the region of 150-500 KT. However for each target there is a need for a specific weapon, be it a command post deep underground or mobile, nuclear weapon storage mostly underground or deep in hills/mountains, nuclear forces underground or deployed in field areas, nuclear installations generally above ground with some underground, economic or industrial zones open and spread out, population centres, military airfields, naval forces, army deployments mobile and dispersed, EMP at high altitude for destruction of systems and grids, earth or concrete systems penetration.

Ballistic Missile Defence (BMD) is helpful in raising the nuclear threshold, and if deployed in limited areas helps maintain Strategic Stability. The BMD systems are needed to intercept at exo-atmosphere and endo-atmosphere levels and interception of missiles of different ranges requires separate interceptors.India has adversaries whose missiles have ranges of 180 km, 290 km, 450 km, 600 km, 750 km, 1100 km, 2000-2150 km, 3000 km, 5500 km, 7000km and 10000 km.Given the complexities and cost involved in putting in place BMD to cover India, it may be prudent to protect only important areas to include value areas, command centres, important political centres e.g. national capital or critical industrial areas. The BMD should cover all vital areas with systems to address ballistic missiles and be technologically increased and improved to intercept future hypersonic vehicles and cruise missiles.

India must take notice of these developments and many more which are not in the open domain but must occur as a natural sequence to announced details. The technologies quoted by leading powers and our adversaries of necessity must be

incorporated into our arsenal and C4I2SR systems. New technologies are going to change the way wars will be conducted in the future, especially use of autonomous systems, information warfare and analytical data systems. The nuclear domain is witness to many new developments in all nuclear weapon holding states.

India should follow a proactive public nuclear signaling policy to reassure the public. Adeliberate and well thought out nuclear signaling policy should be put in place to inform the nation and simultaneously direct the message to the adversary(s). The Nuclear Command Authority leadership must address the issue on select occasions to ensure credibility of the resolve without conveying an aggressive posture. Similar to the nuclear doctrine a paper on national security including nuclear policy should be issued periodically..

Conclusion

The primary threat India will continue to face will be China, and it will goad Pakistan, even at the expense of Pakistan's ruin, to pose security challenges to India, and the continued collusive arrangements between them to keep India embroiled regionally, and deny any peace and growth in the country. China will continue to create reasons and situations to suit its policy to destabilize the region, challenge the neighbours and roil the international system.

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