

VISITING FACULTY LECTURE

**INDIA'S NUCLEAR DOCTRINE  
AND  
NATIONAL SECURITY POLICIES**

**Arvind Kumar**



CAS - I  
DEPARTMENT OF  
INTERNATIONAL RELATIONS  
JADAVPUR UNIVERSITY  
KOLKATA-700 032, INDIA  
2012-13

VISITING FACULTY LECTURE

INDIA'S NUCLEAR DOCTRINE  
AND  
NATIONAL SECURITY POLICIES

ARVIND KUMAR



CAS - I  
DEPARTMENT OF  
INTERNATIONAL RELATIONS  
JADAVPUR UNIVERSITY  
KOLKATA 700 032, INDIA  
2012-13

ARVIND KUMAR  
INDIA'S NUCLEAR DOCTRINE  
AND  
NATIONAL SECURITY POLICIES

Published : February 2013  
© Jadavpur University

Price : ₹ 50

Published by  
Dr. Pradip Kumar Ghosh  
Registrar , Jadavpur University  
Kolkata 700032

Printed by  
Sri Sanat Kumar Basu  
Foreman  
Jadavpur University Press (Printing)  
Kolkata 700032

## ACKNOWLEDGEMENT

The paper on "India's Nuclear Doctrine and National Security Policies" published by the Department of International Relations at Jadavpur University has been an academic exercise to understand the contours and challenges of India's national security and its policy responses. The paper has reflected a number of issues including India's responses to China's rise in Southern Asia. The academic exercise was made possible because of the UGC - CAS programme of the Department of International Relations.

I express my sincere gratitude to the UGC - CAS programme and its Coordinator Prof. Sumita Sen for inviting me and arranging all the lectures. This paper could not have seen light of the day without her constant motivation and support. I am grateful to her for all the arrangements and the local hospitality.

I am also thankful to the Department of International Relations and its Head, Dr. Shibashis Chatterjee for inviting me to deliver a number of lectures to the Masters and Ph.D. students on international security issues.

I also thank the Registrar of Jadavpur University for all the logistics support.

I alone am responsible for any errors or mistakes in this paper

DR. ARVIND KUMAR  
Professor of Geopolitics and International Relations  
Manipal University, Manipal - 576104

ARVIND KUMAR

PREFACE

We wish to express our deepest gratitude to Professor Arvind Kumar for providing invaluable support to the CAS-I Programme of our Department by delivering a series of lectures in his capacity as Visiting Faculty during 4-12 November, 2012. The present work is based on one of the lectures delivered by Professor Arvind Kumar during his visit on India's nuclear programme. We are confident that this piece of outstanding academic research will be immensely enriching for all readers and particularly rewarding for those especially interested in the subject. The views expressed though, in this paper, are the author's own and do not in any way reflect those of the institution.

DR. SUMITA SEN  
Professor & Co-ordinator  
CAS-I Programme  
Department of International Relations  
Jadavpur University  
Kolkata 700032, INDIA

## India's Nuclear Doctrine and National Security Policies

ARVIND KUMAR

India's best national security interests can be served in a nuclear weapon free world. Since, there is a lack of genuine and serious commitment on the part of the acknowledged nuclear weapon states towards achieving global nuclear disarmament with a definite time framework, India had to go nuclear and exercise its nuclear options overtly in 1998 after maintaining restraint for a number of years. India tested a total of five nuclear devices at Pokhran on 11 May and 13 May 1998. The Government of India made a number of detailed statements on the reasons for testing and the future of its nuclear policy.<sup>1</sup> After India crossed the nuclear rubicon, it was warranted to have a nuclear doctrine. India evolved a set of principles on which the future course of action could be based as far as its nuclear issues were concerned.<sup>2</sup> It was certainly established after the nuclear tests that India has a proven capability for a weaponised nuclear programme. India conducted two additional nuclear tests on 13 May 1998.<sup>3</sup>

There were number of reasons for India going nuclear. The major strategic rationale for the construction of a credible and effective Indian nuclear weapon posture was reflected in India's decision to conduct nuclear tests. The articulation of India's threat perception especially in the context of the growing China-Pakistan

nexus in the strategic domain was also one of the reasons for India going nuclear. It is a well known fact that China assisted Pakistan's nuclear weapons and missile programmes. India was always in search of maintaining its strategic autonomy in the decision making process. The acquisition of nuclear weapons by India provided a hedge and also insured security against the possibility of a belligerent China in an uncertain anarchic world.<sup>1</sup>

There is no doubt in saying that the national security concerns of India provided impetus and created conditions to develop nuclear weapon capabilities.

The paper would analyse various principles of India's nuclear doctrine - from its stated no-first use of nuclear weapons against nuclear weapon states and non-use of nuclear weapons against non-nuclear weapons states, achieve a triad capability, maintain a minimum credible nuclear deterrent capability and evolve a robust command and control system. India has been consistently moving towards the acquisition of its stated objectives in its nuclear doctrine. India has acquired nuclear powered submarine to complement its no-first use policy. An analysis and assessment would be done on India's nuclear doctrine and a linkage would be established with its overall national security requirements and the changing contours of foreign policy.

#### **Main Features of Indian Nuclear Doctrine**

The Indian nuclear doctrine highlights and symbolically messages to the rest of the world autonomy of decision making in the developmental process and in strategic

matters in a world where nuclear weapons for a select few are sought to be legitimized for an indefinite future, and where there is growing complexity and frequency in the use of force for political purposes. It is obvious that the central motivation for India's nuclear doctrine has been the strategic autonomy.

As per the nuclear doctrine, India has been pursuing a policy of credible minimum nuclear deterrence towards potential adversaries. The doctrine clearly highlights that India's peacetime posture aims at convincing any potential aggressor that any threat of use of nuclear weapons against India shall invoke measures to counter the threat and any nuclear attack on India and its forces shall result in punitive retaliation with nuclear weapons to inflict damage unacceptable to the aggressor. A great deal of discussion has taken place on what constitutes such a deterrent, and how its acceptance represents a movement of India away from its previously unstated doctrine ("unstated" because it was not openly declared to the rest of the world), called by various such names as non-weaponised, existential or recessed deterrence by a number of scholars. The attempt has always been made to draw the inferences from the Indian strategy.

Deterrence in India's case means that the potential adversary is discouraged from embarking on an attack by ensuring that the consequences of such attack would be disastrous for the adversary. Hence, it can be said that the doctrine is preventive because it prevents the war. India should be seen as capable of launching an attack on its adversary if any eventuality occurs.



The most remarkable and debatable part of India's nuclear doctrine has been its 'No-First Use' policy. India will not be the first to initiate a nuclear strike, but will respond with punitive retaliation should deterrence fail. It makes a strong and categorical 'no-first-use' statement. It is, therefore, essential to say that the nuclear doctrine is defensive but reactive. The main aim of India is to preserve its autonomy.

The doctrine also talks about India's acquisition of triad capability. The nuclear doctrine states that India retains the options of using land, air and sea based assets as a retaliatory action. The possession of the triad capability has been basically a logical consequence of the other principles that exist in the doctrine. They are inescapable if other principles have been accepted by India. It complements India's no first use policy. The fact of the matter is that if India is taking defensive as well as reactive posture then it has to be fully equipped with all the required assets. The sea-based assets will be required because aircraft and missiles are vulnerable to first strike. The extraordinary improvements in remote surveillance, with resolutions of less than 1 metre now available from satellite platforms, make it difficult to keep land-based assets from observation. The possession of sea-based assets is of great necessity to India's force structure.

If one looks at the history of the development of nuclear policy in India, it has been basically reactive and never aggressive. The Chinese invasion of 1962 and their explosion of 1964 led to the first reconsideration of India's nuclear programme. The 1974 Indian explosion at Pokharan was a reaction to the intrusion of the *USS Enterprise* in the Bay of Bengal during the Bangladesh

War of 1971. It is a well known fact that the United States' Government made a number of statements regarding the actual use of nuclear weapons and a number of nations' were bullied. Given this situation, a country like India which considers preservation of its autonomy essential had to react in a different way.

It must be emphasized here that a number of bodies at various times have made statements about nuclear disarmament, including the International Court of Justice, the Canberra Commission and a host of other distinguished international groups. The acknowledged nuclear weapon states more particularly the United States' never paid much heed to any of these proposals. Everybody knows that China supplies nuclear materials to Pakistan, and has perhaps even conducted a nuclear test for them. The P-5 moves on nuclear non proliferation are just not credible, and cannot be taken seriously. The US continues to think that its security position required a strong deterrent, but others' do not!

The larger frustration caused by the acknowledged nuclear weapon states for not showing genuine commitment and seriousness to move towards nuclear zero, India had no option but to go nuclear. It was basically a desperate attempt to recapture a sense of national autonomy on part of India.

### **India's Land Based Assets as a Part of India's National Security Policies**

India's growing ballistic missile capability can only be understood in the context of its threat perception matrix in the current international security environment. If one articulates India's threat

perception, one can say that India has more immediate problems with Pakistan than China in real sense of the term. These problems are also interlinked because of China's behaviour and its covert collusion with Pakistan with a single-minded aim of creating a counterweight to ensure that India is kept distracted with a proxy war. The Jammu & Kashmir problem is unlikely to be resolved in near future because, for India, it is not a core issue, but one that Pakistan has unnecessarily inflated. Pakistan's desire to keep Jammu & Kashmir on the boil will remain. The recent firing at LOC is a case in point. India also fears that China will continue to harbor hegemonic ambitions. China is very much adamant on some of the major issues with India. It seems very unlikely that China will give up its claim on regions like Arunachal Pradesh in India. Hence, in the prevailing milieu, there is a distinct possibility that India would be growing both militarily and also in terms of acquiring strategic assets where delivery systems become a crucial component and requirement.

India's national security has always been adversely affected by the action-reaction syndrome. US and Russian strategic capabilities drive China's strategic modernization programme, which ultimately triggers increased deterrent requirements for India. In the current prevailing circumstances, India would never agree to forego its strategic options unless the US, Russia and China agrees to get rid of their strategic options. It is, however, strongly believed among strategic academic thinkers in India that the strategic assets including nuclear weapons and ballistic missiles are not usable war-fighting instruments. Rather, the

possession of nuclear weapons and its delivery systems makes other major powers moderate their behaviour and limits the nature of any conflict between states possessing nuclear weapons. Strictly speaking, nuclear weapons are weapons of deterrence for India but for Pakistan these weapons are weapons of war.

Undoubtedly, India's ballistic missile programme is second only to China in the developing world. India's ballistic missile programme is in large part a response to China's capabilities and is absolutely de-linked from the civilian space programme. India initiated its Integrated Guided Missile Development Programme (IGMDP) in 1983 with the sole aim of achieving self sufficiency in military missile production and development. The IGMDP comprised five core systems: the Agni series of both medium and intermediate range ballistic missiles (MRBM & IRBM), Prithvi series of short range ballistic missiles (SRBMs), the Trishul short range surface to air missile (SAM), the Akash medium range surface to air missiles, and the Nag - anti-tank guided missile.

The IGMDP in addition to a number of other defence projects is being managed by the Defence Research & Development Organisation (DRDO). The DRDO functions as the nodal agency for the execution of major development programmes of relevance to the Ministry of Defence (MoD) through integration of research, development, testing and production facilities with the national scientific institutions, public sector companies and other agencies. The DRDO has contributed significantly & phenomenally in building the ballistic missile infrastructure and technology. The Defence Research & Development Laboratory (DRDL)

located in the Defence Research Complex at Kanchanbagh and the Research Centre Imarat (RCI) at the same location in Hyderabad has been responsible for the development of India's advanced missile technologies. Bharat Dynamics Limited of Hyderabad, a commercial defence contractor to the MoD has been integrating the missile components and assembly.

India's ballistic missile programme, by and large, has been indigenous. The contribution of DRDO in achieving some of very sensitive strategic technologies including solid propellant systems has been phenomenal. Despite the sanctions and technology denial regimes, DRDO has shown to the world that India has the capability to develop defence and strategic technologies indigenously. India's successful test firing of surface-to-surface nuclear capable Agni-3 missile in May this year has demonstrated to the rest of the world that it has achieved the technological prowess and joined a very select group of advanced nations which have the Intermediate Range Ballistic Missile (IRBM) capability. The DRDO in real sense has been able to provide India with the credible minimum nuclear deterrent. India has now the capability to target its major adversary in the current threat perception matrix.

The Agni medium range programme begun in the late 1980s and in between suspended a couple of times. It was suspended in 1994 during Prime Minister Narasimha Rao's regime because of diplomatic pressure being emanating from the United States. There was a lull in India's Agni medium range programme during 1994 - 1998. The programme resumed during the Bhartiya Janata Party government

in 1998. The Agn-2 medium range ballistic missile with a range of 2000 km. and a 1,000 kilogram payload was first tested successfully in April 1999. The test was conducted just before the BJP government in New Delhi faced a no-confidence motion in the Indian Parliament in 1999. It never succumbed to the outside pressure. India took this decision after reviewing the international security environment and India's place in that environment. The programme got a real boost and the research and development was strengthened.

The regional security environment in South Asia deteriorated and India's main adversary Pakistan created a major crisis in Kargil. At the same time, Pakistan also demonstrated its ballistic missile capability by conducting its Ghauri and Shaheen - I series test during the Kargil crisis. Such actions by Pakistan prompted India to review its ballistic missile programme and started concentrating and focusing on its Agni - II programme. The successful test flight of India's Agni - 2 programme took place in January 2001.

The Agni - 2 was basically an improvement over India's Agni - 1 programme. Agni - 2 is a two stage, rail and road mobile medium range ballistic missile with a solid fuel rocket and with an upgraded guidance system. The Agni - 1 had a liquid-solid rocket motor combination and technically speaking inertial guidance was not active in this missile. It was basically a technology demonstrator programme where the objective was to reach to a less than a perfect system. After reviewing and analyzing the data released on Agni - 2, one can easily conclude that it could reach any part of Pakistani territory. Hence, India has the advantage of basing this missile deep inside the

country. Hence, the survivability factor against India's western neighbor would go up under these modes of basing.

It must be reiterated here that the Agni - 2 has the capability to reach the parts of western China but lacks the capability to target both the capitals – political and commercial (Beijing & Shanghai). This void has now been filled by DRDO by acquiring Agni - 3. India certainly would place most emphasis in the next 10 – 15 years on the development and production of Agni - 3. The induction and mating of these missiles with nuclear warhead would very much depend on the structure of both international and regional security environment.

India's short range ballistic missile (SRBM) programme consisting of Prithvi series of missiles would be restricted to use and target against Pakistan. Prithvi has already been inducted into Indian army. It has a range of 150 km with dual role to play. It can carry both conventional and nuclear warhead to its destination. However, it is generally believed among the strategic community that India will not use Prithvi as WMD delivery system to deter Pakistan against using or threatening the use of its nuclear weapons. India's SRBM programme is fully matured and operational. It should be emphasized here that the delivery systems are separated from the nuclear warhead and they are certainly not on hair trigger alert like the US and Russia. Even after 17 years of the demise of the Soviet Union, both the US and Russia have put their nuclear warheads in mated condition with the delivery system on hair trigger alert.

India's defence concerns would largely be confined to its regions. Changes in China's nuclear and ballistic missile capabilities would force India to re-examine its definition of a minimum nuclear deterrent. India's aspirations in the field of missiles and nuclear weapons are in large part a response to China's capabilities and intentions. In the current regional security environment, India's main target would be to contain China and in the process it would be sufficient to cover targets in Pakistan. Viewed in this context, Indian planners and the scientific and technical community of DRDO have also acquired long range IRBMs Agni - 5 to have a second-strike capability against China. The defence strategy of India should be China - specific while also taking into account Pakistan's actions. The threat perception matrix warranted India to emerge as a missile power in the current international security milieu. The contribution of DRDO in making India a ballistic missile power is immense and phenomenal.

#### **Missile Build up in Southern Asia and Its Implications for India's National Security Policy**

India's technological response to the future ballistic missile build-up in Southern Asia would always be guided by the activities of the countries of concern in India's neighbourhood. So far, India's relations with China and Pakistan have been characterized by poor communication and mutual distrust. Within this context, the delivery systems of all categories (short range, medium range and intermediate range ballistic missiles) for nuclear and conventional warheads strongly influence each country's threat perceptions and military strategy. The growth of Indian, Chinese



and Pakistani ballistic missiles in the last couple of decades in particular shows a gradual improvement and significant capability in their programmes. For each of these nations in India's neighbourhood, nuclear armed missiles provide a survivable deterrent force and conventionally armed missiles can balance military inferiority. However, uncertainty about the status of an opponent's missiles, short warning time and the consequences of a sudden attack may cause a country to strike pre-emptively in the early stages of a crisis.

Ballistic Missiles present a combination of operational capabilities (range, survivability, lack of an effective defence) and features (flexibility, cost) unmatched by aircraft. As nuclear delivery systems, they can provide a survivable deterrent force. Ballistic missiles play an increasing role in the political and security dynamics of Southern Asia. India and Pakistan frequently match missile tests on a fit-for-tat basis.

The two ballistic missiles launches by Pakistan under the new regimes over the years have shown an avowed commitment to develop delivery systems of long ranges. Pakistan's desire to achieve some sort of strategic parity with India in particular has always been on their radar screen of the strategic planning. The report appearing in both national and international media quoting the Pakistani military confirming the successful launch of a long range nuclear capable ballistic missile called Hatf VI or Shaheen II. More recently, the Strategic Forces Command (SFC) of Pakistan for the first time launched the Shaheen -II nuclear capable ballistic missile to mark the culmination of the field training exercise. All the previous launches so far particularly for this Shaheen II missile were conducted by defence scientists and

engineers. The involvement of SFC at this stage of launch signals advancement in their delivery systems. It also highlights the possible integration of their operational aspects of command and control systems.

The claims made by Pakistani military in particular and various reports in general about the capability of this ballistic missile Shaheen – II have been by and large similar. It has been claimed that the Shaheen – II missile has a range of 2000 km and can carry both nuclear and conventional warheads. It is a two-stage solid fuel missile with high accuracy. According to the statements issued, the launch was a part of the process of validation and technical improvements to consolidate and verify various land-based strategic missile systems. Claiming to achieve high accuracy certainly signifies the improvement in the guidance and control systems.

The technological advancement made in acquiring a long range missile like Shaheen –II for Pakistan especially in terms of guidance and control system and also the improvements in ranges and payload requires an introspection and image analysis for validating the claims made by the Pakistani military and engineers. It must be stressed here that the history for developing Shaheen –II has not been too long. The Shaheen – II was first tested in 2004 and the consistency for the tests was maintained by Pakistan by having minimum one launch every year. This year 2008 has been an exception so far because Pakistan has already launched Shaheen –II twice. Hence, this also shows the desperation on part of Pakistani establishments to achieve a delivery system, which can carry a nuclear warhead to the remotest corner of India.

From the publicly available images of earlier launches of Shaheen - II ballistic missile, one can infer a number of things after conducting image analysis by using very refined software. Several launches of Shaheen - II in the last three and half years have indicated a trend of very minimal improvement in their performance and capabilities. The various images of Shaheen - II launch available in the public domain ([www.tribuneindia.com](http://www.tribuneindia.com) and [www.insurancebroadcasting.com](http://www.insurancebroadcasting.com) ) do suggest that there is a length increase from 12.5 metres (of an earlier Shaheen - II missile launch) to 13.1 metres. The increase in the warhead length has also been marginal if not phenomenal. There is not much of difference in the lengths of the two stages. The image analysis of the available images of Shaheen -II also confirms that the publicly available data on the range and the payload of this particular missile is not true. The range of Shaheen -II would be at most 900 km with a 1000 kg payload and roughly 1200 km with a 700 kg payload. The usual thumb rule is that less the payload more the ranges.

There is no doubt in saying that the capability to develop ballistic missile and the progress made so far in Pakistan has been quite satisfactory. The current reality seems to be that Pakistan does not require significant outside support for maintaining its ballistic missile infrastructure. It has been able to achieve a credible missile force. The objective of Pakistan would always be to improve and acquire the emerging technologies.

Despite the fact that both the neighbours, India and Pakistan notify each other of their ballistic missile tests in advance, the signaling to each other still remains

a dominant issue as far as their strategies to deal with each other are concerned. Both the countries routinely carry out missile tests. The time is not to misunderstand each other but to maintain some sort of rational deterrence framework. Three major requirements for stable nuclear deterrence must exist or be created in the India-Pakistan context. First, both countries must develop not just the ability to inflict unacceptable damage to the other side, but also a sufficient degree of 'second strike' invulnerability so that their forces could retaliate if attacked first. Second, the threat to retaliate with nuclear weapons for a nuclear attack must be credible. Third, the nuclear arsenals must not be prone to accidental or unauthorized use. The third requirement for Pakistan to fulfill has been a daunting challenge. The whole of the world is serious about this and at different point of time has shown concern. The international community *per se* has been very much worried on this issue.

### China's Ballistic Missile Capability and Its Implications for India's National Security

China has evolved a robust ballistic missile programme and infrastructure in the region. The requirement for China and its threat perceptions are different. The US presence in the Asia-Pacific region has a direct bearing on China's strategic modernization programme. China in the last five decades has been able to do the systems integration very nicely. Their concentration on the solid propellant system in the current context and the desire to achieve the nuclear deterrent capability against the US has strengthened organizational structure.

China has deployed the DF-3, the DF-4 / 4A and the DF-21 to target India. The DF-3 is deployed at the

Jianshui and Kunming bases in Yunnan province. The DF - 4 is deployed at Da Qaidam, Delingha and Xiao Qaidam bases in Qinghai. Delingha and Xiao Qaidam seemed to have deployed nuclear tipped ballistic missiles. The DF-21 has been deployed at the Chuxiong base, approximately 100 km west of Kunming in Yunnan. At the Jianshui base DF-3 is being replaced by the DF-21. China has the capability to target all parts of India. There is no dispute in this fact at all. China's ballistic missile forces are organized into a separate military organization called the Second Artillery Corps.

Under the current circumstances, India is most likely to continue conducting ballistic missile tests to validate delivery systems for its nuclear deterrent while exercising strategic restraint. The technological advancement in India would help in improving the various parameters of almost all the categories of ballistic missiles.

India's defence concerns would largely be confined to its region. India's technological aspirations in the field of ballistic missiles and nuclear weapons are in large part a response to China's capabilities and intentions. In the existing geopolitical milieu, India's main target would be to contain China's growing sphere of influence in the region. Indian nuclear requirements would be sized against China, which should also be sufficient to cover targets in Pakistan. Viewed in this context, Indian planners and scientific and technological community would keep concentrating on achieving long-range IRBMs to have a second strike capability against China. India need not pursue an ICBM capability despite the technological potential for

making such missiles. The geopolitical and geostrategic environment in the Indian subcontinent currently, however, do not warrant any increase in the arms race. The real challenge right now has been to explore ways to deal with the invisible enemy where the role of non-state actors is becoming dominant.

### **Technology and Strategy of India's SLBM Capability: Integration with INS Arihant**

The long felt need for acquiring submarine launched ballistic missile (SLBM) on a priority basis by India became imminent after India detonated a number of nuclear devices in May 1998. India, for the first time, explicitly articulated the requirement for achieving sea-based assets in its draft Indian nuclear doctrine released in August 1999, which was later formalized in the January of 2002. The draft Indian nuclear doctrine was also regarded as the logical conclusion of the nuclear tests India conducted in May 1998. It was the desire of the acknowledged nuclear weapon states (USA, UK, Russia, France and China) themselves that India should come up with a nuclear doctrine and end the ambiguity that they considered was characteristic of Indian positions on nuclear weapons.

It must be reiterated here that the possession of the triad (land, air and sea based assets) by India becomes not only important but necessary in terms of having an effective second strike capability. In any case of crisis and eventuality, both land based and air based assets are highly vulnerable to a first strike or decapitating strike, where the objective of the adversary would be to wipe out all the major nuclear installations including command and control centres. The possession

of sea-based assets would only provide the retaliatory capability. Hence, for India, attaining sea-based assets becomes significant. The potential adversary must be aware of the swiftness of an Indian response.

The salience of sea-based assets (submarine launched ballistic missiles and the nuclear powered submarines) has been very well reflected in all the policy statements made during the last one decade. Sea based assets primarily put missiles in submarines. The technology required for the launches of submarines has always been challenging. It should be pointed here that after consistent efforts put together for almost one decade (however, India started ATV project way back in early part of 1980s but was slowed down for various reasons), India launched its first nuclear-powered submarines in July 2009. It is 110 metre long called INS Arihant which means "*Destroyer of the Enemies*". The nuclear powered submarine project in India has been widely known as the Advanced Technology Vessel (ATV) project. By and large, the ATV has been an indigenous project. India became the sixth country in the world after the US, Russia, China, France and UK to acquire nuclear powered submarine. The United States has the highest number of nuclear submarines in the world. It has 74 and China has around 10 nuclear submarines.

The requirement of SLBM of higher range to complement and exploit the effectiveness of nuclear powered submarine for India has been of great significance to the maintenance of national security during crisis time. The pace at which India's SLBM project has grown over the years can not be termed as rapid. It has taken its own time. However, the recent

SLBM tests in the last couple of years have shown that India is steadily moving towards the acquisition of this technology. The R&D effort put by India for the SLBM project has again been by and large indigenous. Unfortunately, the SLBM tests conducted so far by India have used underwater launcher, which was positioned roughly 60 metres deep in the sea. Usually, nuclear submarine is required to launch the SLBMs. India until July 2009 was not having a submarine capable of firing an SLBM. The SLBMs are considered the safest missiles which make them hard to locate and difficult to destroy.

The Sagarika SLBM in India is powered by a turbojet and the tests results have shown that it can carry a 500 kg payload. The length of SLBM is 8.5 metres and the diameter is roughly one metre. The successful test firing of India's SLBM K-15 has confirmed that it has two stages and it is capable of carrying a payload up to one tone. The missile can reach to a target at a maximum distance of 700 kilometres. The SLBM tests had been conducted in an underwater platform. The tests were intended to check speed, trajectory, azimuth and various other parameters of the missile.

The measurements done on the K-15 images have made it clear that this nuclear capable missile is 11 metres long. The K-15 is larger than the Prithvi a short range ballistic missile, which has a length of roughly 9 metre and smaller than the 15 metre long Agni-I ballistic missile.

It has been widely reported that India has secretly tested a SLBM, which can be integrated with nuclear powered submarine having a range of 1500 kilometre.



There is, however, not sufficient information available in the public domain to validate these claims about the range. It is a well known fact that the Sagarika has been solely designed which would be integrated with INS Arihant. Once the Sagarika is deployed, India would join the group of few nations namely, the US, Russia, China and France which have the capabilities to launch ballistic missiles from air, land and sea.

It is anticipated that the deployment of SLBM by India would initiate a new arms race in the region. Undoubtedly, Pakistan may like to acquire such missiles. So far, Pakistan possess land based ballistic missiles (Ghauri, Abdali, Ghaznavi and Shaheen series consisting of short, medium and intermediate range) in their inventory. In addition to land based ballistic missiles, Pakistan also possess cruise missile (Babur) that can be fired from warships, submarines and fighter jets. China has already acquired and deployed SLBMs. The JL-1 and JL-2 of Chinese inventory are the sea-based versions of their DF-21 and DF-31 land based ballistic missiles. The range of the JL-1 is 3073 km (based on the image analysis and the calculations done) and JL-2 is expected to be roughly 5000 km. The JL-2 so far has not become operational. After the JL-2 becomes operational, the Chinese may be able to launch a multiple independently targeted reentry vehicle (MIRV) from a submarine (Type 092 Xia class and Type 094 Jin Class) with a range of about 8000 km. It should be noted here that China is yet far behind in comparison to the capabilities of the US Trident missile where 8 MIRV can be launched. It is calculated that the Chinese may be able to launch only 3 MIRV at a time so far. However, China has been focusing on acquiring and improving its overall capabilities

through its ongoing strategic modernization programme.

India certainly would require to extend the range of the Sagarika SLBM to roughly 2,500 km. The current range is not sufficient to have a credible nuclear deterrent capability. The articulation of India's threat perceptions in the current international security environment certainly warrants to have a SLBM of long range. The primary requirement of INS Arihant nuclear submarine would be to have a SLBM of intermediate range so that India would be bale to deter its adversaries. Such sea based assets would not only help India in possessing a viable and credible second strike capability to inflict unacceptable damage to an attacking enemy but also provide lots of confidence in terms of achieving India's strategic objectives. The nuclear propelled submarine launched ballistic missiles would also complement India's policy of no-first use of nuclear weapons. A retaliatory strike weapon from the sea towards India's adversaries would not only be of urgent necessity but very central to its nuclear strategy and doctrines.

Undoubtedly, a 700 to 1500 km range of SLBM for India would not serve a meaningful purpose in terms of achieving a credible nuclear deterrent capability. India would certainly require to pursue to achieve a SLBM of Agni-III range. Ballistic missile submarines would be of great strategic value for India. The best part regarding having SLBM in the inventory is that even the reconnaissance satellites would not be able to detect it and hence such missiles become immune to a decapitating strike directed against nuclear forces. It provides both freedom to attack and freedom from

attack. It would allow each side to maintain the capability to launch a devastating retaliatory strike even if all land based missiles have been destroyed. The national strategic imperatives warrant India to prioritise its requirement to protect its national security interests.

### **India's Air Power Capabilities: Integrated with India's National Security Policies**

Undoubtedly, air power is an essential component of modern warfare. The evolution of air power capabilities in India has been directly linked with its threat perceptions and the articulation of its requirements. It is, therefore, important to note that in the existing scenario of regional security environment, India needs to be better equipped with the defensive systems which would be required in any eventuality. These defensive systems could also help in building a deterrent capability, which ultimately would help in containing the crisis. The danger during the crisis arises only when the defender lacks the capacity or resolve to meet its commitments or is determined and powerful enough but fails to signal to its adversary about the capabilities. Under this condition, it becomes necessary for India to acquire all the possible gadgets for the readiness in modern warfare.

It is generally believed among the members of strategic community that without having air superiority, it would be a difficult proposition for any nation state to sustain itself during the crisis time. Undoubtedly, Airborne Warning and Control Systems (AWACS) is an important ingredient of air power. At the same time, AWACS will have no great role to play if there is no air superiority. The goal of the warning mission has

always been to alert national forces of any air vehicle attack, which ultimately helps in preserving strategic bomber forces. The adequate warning can only escape strategic bomber forces from the probable attack during the crisis time.

Under this scenario, a very legitimate question could be, "why India should worry about warning of attack by slow air vehicles when a strategic attack on India would clearly first be manifested by the obvious arrival of ballistic missile nuclear warheads"? There might be couple of responses to this question and which to a greater extent expound the theory that air power capabilities make a nation determined and confident during both crisis and peace time. First, India should not leave an "open door" for Chinese cruise missiles or aircraft to fly completely undetected to strategic bomber bases and other important targets. If India leaves the door open, it would be naïve to anticipate that it would never be exploited in a strategic attack. Secondly, the massive strategic attack from China has not been the only concern for India's national security. One needs to be concerned about possible future air vehicle attacks from lesser powers like Pakistan, which is also a nuclear weapon state and is very much hostile towards India and also constantly creating problems across Indian borders.

Airborne surveillance radars are being viewed increasingly as a fundamental asset for use during missions ranging from all-out war to peacekeeping operation. The possession of airborne surveillance radar enhances air power capabilities. The possession of AWACS in particular has been viewed as a vital force multiplier. Despite the fact that, India so far has not

been able to achieve AWACS indigenously, the Phalcon based radars of Israeli origin has been mounted and perform operations as and when it is required.

Bearing in mind that any future conflict with India's adversaries would require the level of India's defence preparedness at a very higher degree, the military planners and strategists in India would require to put a greater emphasis on self-reliance. India in this case would certainly need to acquire force multipliers like night-fighting sensors, better air-defence equipment, real-time command, control, communications and intelligence systems in addition to a modern electronic warfare capability. There seems to be glaring operational gaps in India's overall defence capabilities as far as air defence and air capabilities are concerned. The need of the hour is to upgrade the air-defence system in the eastern part of the country in view of China's expanding air power projection.

An elaborate ground infrastructure to facilitate rapid transfer/re-deployment of the air force between the west and east against Pakistan and China needs to be put in place at the earliest possible time period. The perilous scenario under which India has been undergoing with regard to air power is not very satisfactory. The report about the existing fleets of the aircraft which keeps appearing in the world media presents a very precarious picture about the Indian Air Force. For the last five decades, MiG 21s has been the backbone of the Indian Air Force. It is a well known fact that most of the MiG-21s in possession with Indian Air Force are basically the Russian's aircraft of the earlier era. The prevailing and dominant view in India has been that India became so dependent on Soviet

military technology that it could not enhance its own indigenous production on the one hand and it could not even shown willingness to cooperate with other countries.

The recent short listing of Euro-fighter and French Rafale aircraft done by India in terms of buying 127 medium multi role combat aircraft (MMRCA) has been a byproduct of long endeavours of the modernization of India's air power capabilities. Such short listing after careful scrutiny done by India on the other contenders like Swedish Gripen, F-16s, F-18s reflects India's growing concerns for enhancing its air power capabilities. The short listing must have factored the technical specifications and a number of other parameters including maneuverability, acceleration and flight envelopes. The primary sensor system and high-tech electronic devices in the combat aircrafts become very important in terms of understanding the endurance and survivability. India certainly would be able to achieve primacy if it receives 127 MMRCA. There is also a growing pressure from the Indian Air Force on India to buy a number of additional MMRCA.

It would be a worthwhile exercise to understand the compositions and functioning of the Indian Air Force. The Indian Air Force has been split into seven commands, which works under the stewardship of the Head Quarters located in New Delhi. There are five commands, which are geographical out of seven and two are mainly training and maintenance commands. Western air command is also based in New Delhi and controls the northwestern states including the disputed Kashmir. It has around nine permanent airbases and four forward airfields. Its air defence squadrons operate

Mig-21s, MiG-23s and MiG-29s while ground attack forces use the MiG-21, MiG-23, MiG-27 and Jaguar.

South Western Air Command has been based at Jodhpur and it covers western states such as Rajasthan and Maharashtra. Its air defence units operate the Su-30s, as well as MiG-21s, MiG-23s and maritime strike Jaguars. Central Air Command located at Allahabad controls the area between Delhi and Bengal. It has MiG-21 and Mirage 2000 in its air defence units and it also controls the majority of the Indian air force's transports, both fixed and rotary wing.

The Eastern air command based at Shillong covers the border with Bangladesh and Myanmar and its air defence squadrons operate MiG-21s while the strike units use MiG-27s. Southern Air Command is based at Trivandrum and it covers the south and is responsible for operations in the Bay of Bengal and around the Andaman and Nicobar islands. It controls no squadrons.

The current situation of all the air-defence squadrons clearly reflects that despite the fast changing international security environment and various advances made in the technological sector, India seems to be mostly banking on its existing fleets of obsolete MiGs.

The urgent necessity for India in the existing milieu would be to prevent airborne reconnaissance and then provide enough active defence to deter or interdict aircraft attacks by terrorists or other hostile adversaries. A demonstrated ability to place a manned interceptor in a position to engage an unidentified aircraft before it reaches the Indian coastline or border should be the

general goal and in the process India would be able to enhance its air power capabilities. These tasks would be accomplished by the network of radars and manned interceptors described for the warning mission.

The technical challenges before India are very substantial and it requires to be addressed by the key policy makers and the scientific community. Efficient coverage of India's earth surface requires radar operation keeping in mind the border related problems at ranges of 200 to 300 km and these long ranges might be a challenge for detecting low-observable vehicles. It would be possible only when India will have air superiority.

With air superiority, aircraft can drop their smart bombs with less fear of coming under attack while guiding them to their target, thereby offering a greater probability of a successful strike. There has always been a quest to find out the enemy's plans and moves well in advance in order to develop one's own operations effectively since the early days of warfare. In other words, domination of the high ground was sought which gave a commander knowledge of the enemy's strength and disposition. This has become very complex in the existing environment where sophisticated technologies have been invented. These complexities by and large have been addressed by radar, which has the effect of forcing air operations down to lower levels to stay below the radar horizon and ultimately helps in evading detection.

Over the years, it seems that India's offensive operations priority is being upgraded along with the air defence. The concept of air defence in India has



been gaining momentum. There seems to be a consensus in India among the key planners that India would require to maintain point air defence in addition to the ability to build a strategic or deterrent air defence. India would certainly require a number of long range aircraft in addition to having a capability of air-to-air refueling.

India has also been working towards having overall improvements in the command, control, communications and intelligence structure in addition to a revamped modernized air defence and communications network. The technological edge in air warfare would become an essential component of India's air power capabilities. India's defence purchases and acquisitions over the years have reflected the major concerns shown by the Indian Air force.

It is anticipated that India will spend roughly US \$ 100 billion dollar on defence acquisitions by 2020. It is also generally believed among the members of academic and strategic community in India that aerospace sector will be given top priority in both research and acquisitions. The emphasis on space assets will be given to complement India's land, air and sea based assets for the formulations of India's future defence and national security policy. The other two areas would be in the field of aerial refueling and air lift capabilities, which might get attention in future.

Air Power is nothing but a military employment of aerospace resources to defend the nation and support national foreign policy. Historically, air power has been used by nation states to accomplish very complex tasks of projection, denial and oversight. The major part of

modern air power theory and doctrine has been mostly directed toward the capability of projection. India has been in the search of a robust air power capabilities where it can have the ability to place its military force at a given location at a certain and definite time.

### Conclusion

The assessment of current international security environment suggests that India will not agree to forego its strategic options unless the same approach is applied to the existing international security architecture including the United States, Russia, and China. It is most likely that India might like to enhance its capability in all the strategic domain including nuclear weapons and delivery systems. The success of Agni-3 and Agni-5, undoubtedly, has boosted India's confidence. The range and payload of Agni-5 would certainly improve in due course of time. India's ballistic missile capability in the current situation has really helped India's nuclear deterrent credible and it is anticipated that India would surely take China's total force structure into account while developing a strategy to enhance its existing capabilities.

India's national security interests would be best served in a nuclear weapon free world. But, unfortunately, the foreseeable future is going to be very complex where strategic competitions among major powers will prevail and dictate the behavioural patterns, which will trigger the arms race in the strategic domain.

### Reference

<sup>1</sup> The Prime Minister of India Atal Behari Vajpayee made the statements to the Indian media immediately after the nuclear tests in May 1998 that India does not require to conduct any more tests and it has collected all the data and put unilateral moratorium on nuclear testing. He also addressed the United Nations General Assembly on 24 September 1998 and outlined key policy statements.

<sup>2</sup> The following key statement was made by the Prime Minister of India just after three hours of the nuclear tests conducted on 11 May 1998:

Today at 1545 hours India conducted three underground nuclear tests in the Pokhran range. The tests conducted were with a fission device, a low yield device and a thermonuclear device. The measured yields are in line with the expected values. Measurements have also confirmed that there was no release of radioactivity into the atmosphere. These were contained explosions like the experiment conducted in May 1974. I warmly congratulate the scientists and engineers who have carried out these successful tests.

<sup>3</sup> After the nuclear tests conducted by India on 13 May 1998, Prime Minister Vajpayee was very explicit in stating that India has now ended the ambiguity and has become a nuclear weapon State.

<sup>4</sup> Robert G. Joseph and John F. Reichart, 'The Case for a Nuclear Deterrence Today', *Orbis*, Winter 1998, p. 14.

## ABOUT THE AUTHOR

Dr. Arvind Kumar is Professor of Geopolitics and heads the Department of Geopolitics & International Relations at Manipal University. He has been conducting policy and academic research on strategic and international security issues in addition to his teaching since 1993. His research interests are in the field of strategic capabilities of China and Pakistan, nuclear doctrines and strategy, Nuclear weapons and delivery systems, ballistic missile defence, global security issues and matters relating to India's foreign policy, Indo-US relations and defence strategy and planning. He is formerly Research Faculty at the National Institute of Advanced Studies, Bangalore and the Institute for Defence Studies & Analyses (IDSA) at New Delhi. He was a Visiting Fellow at the Henry L Stimson Centre, Washington, DC. He was a Post doctoral Fellow at the Sandia National Laboratories, USA and a Visiting Research Scholar at the Institute of International Studies at Stanford University. He was APISA - IDSS Fellow at the Institute for Defence & Strategic Studies at Nanyang Technological University, Singapore. He was appointed as the Visiting Fellow at the University of New South Wales, Sydney for three year period.

He has a number of publications to his credit in journals, edited volumes, magazines and newspapers. He was the Co-editor of a volume titled *Science & Technology to Counter Terrorism* published by National Academies Press, Washington, DC. He has delivered a number of talks both in India and abroad on international security and foreign policy issues.

He holds a M.Phil and Ph.D. in International Politics from Jawaharlal Nehru University, New Delhi.

Dr. Arvind Kumar, M.Phil, Ph.D.

Professor of Geopolitics and International Relations  
Head, Department of Geopolitics & International Relations

Head, Centre for Asian Studies  
Director, STUDY ABROAD PROGRAM  
Manipal University, Manipal - 576104  
Tel: 91 - 820- 2922398, 2922996, 9945864011

Fax: 91 - 820 - 2570062, 2570063

E-mail: [arvind.kumar@manipal.edu](mailto:arvind.kumar@manipal.edu)

---

**NOTES**

---

---

N O T E S

---

**Published by : DR. PRADIP KR. GHOSH**  
*Registrar, Jadavpur University*

*Printed by : Sri Sanat Kumar Basu*  
**Jadavpur University Press (Printing), Kolkata - 700032**