

**RUSSIA-INDIA NUCLEAR COOPERATION,
1991-2006**

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DECLARATION

I declare that the dissertation entitled "Russia-India Nuclear Cooperation, 1991-2006" submitted by me in the partial fulfillment of the requirements for the award of MASTER OF PHILOSOPHY is my own work. The dissertation has not been submitted for any other degree of this or any other university.

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CERTIFICATE

We recommend that this dissertation may be placed before the examiners for evaluation.

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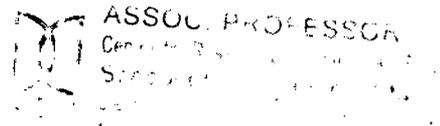
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DEDICATED TO....

The only God I know.....My Father

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PREFACE

Nuclear issues have dominated the international politics in recent times. It's either North Korean nuclear crisis or the Iranian nuclear programme the world has witnessed dramatic incidents. Most of the time it is the proliferation concern which makes the issue oversensitive for the world community. The pitfall of these episodes has been severe for those countries who are trying to find out the alternative of the already scarce fossil fuels. The growth of modern economy has increased the energy requirement of the world without corresponding increase in the energy supply. As India is one of the fastest growing economies of the world its energy requirements are also rising rapidly forcing it to find out the newer sources of energy supply. Nuclear energy has become the focus of Indian policy makers in the recent times.

The present work tries to explain India's nuclear cooperation with Russia. It is divided into three chapters and conclusion. The first chapter makes a historical study of this relationship right from the beginning of India's nuclear programme. It also explores the gradual evolution of Russian nuclear policy towards India. Russia's response to India's nuclear tests in 1974 and 1998 has also been covered. The second chapter explains Russian policy in Indian subcontinent and its adjoining territories. In this chapter, I have tried to explain Russia's interest in the region and its expectations out of its cooperation with India in the nuclear field. Third chapter deals with Russian nuclear doctrine and its impact on Indo-Russian nuclear cooperation. India's need to go for nuclear energy and Russia's role in meeting India's requirement has also been covered. Russia's NPT commitment and its implications for Indo-Russian nuclear deal have also been covered. Lastly, I have covered the constraints of Indo-Russian nuclear deal in fourth chapter. This also covers the recent development which has its implications for Indo-Russian nuclear cooperation. In short, the study tries to find out the various facets of Indo-Russian nuclear cooperation.

Chapter One

INTRODUCTION

Introduction

When nuclear technology was first invented in United States it appeared as atomic bomb. While declaring the successful explosion of the bomb under the “Manhattan Project”¹ in United States Robert .P. Oppenheimer, the lead scientist under whose guidance it was invented, quoted Rig-Veda by saying ‘I’d become the death.’. (Sen, Amartya 2005)² The use of Atomic weapons on two of Japanese cities, Hiroshima and Nagasaki justified the threat at that time. Perhaps the positive aspects of this technology were not visualized at that point of time. As further research in the field took place its potential as reliable source of energy came out. Initially it threatened the international community by giving it the unimaginable power of self-destruction. There is no doubt that nuclear weapons increased the insecurity of the world by increasing the destructive power of mankind manifold. Furthermore, the cold war also added to that insecurity in the forms of arms race and nuclear race. As Soviet Union followed suit and in 1949 tested its nuclear device, the threat of nuclear war started to haunt the world for years to come. As both the blocks acquired the nuclear technology it seemed evident that the future war will be a nuclear war, leading to the destruction of human civilization.

As the world realized the danger of mad nuclear arms race and the potential of nuclear energy became more evident with further technological upgradation, civilian use of nuclear technology became more attractive. The growing need of energy in the world for the development process coupled with the scarce supply of petroleum sources forced the countries to look towards nuclear technology. It opened the vast source of cheap and clean sources of energy for the world. As nuclear technology spread to other parts of the world, different countries started to come closer to cooperate in this sector. Thus a new area of cooperation amongst the nation-states also opened. This led to many treaties and accords for the peaceful uses of nuclear technology amongst the nation states. The energy deficient countries like India started their search for this technology either through indigenous effort or through trade and transfers from more advanced countries of the West. For a developing country like India which had just gained independence and still grappling with the challenges of the colonial legacies it was a great challenge to find a

way out and thus undertake various steps for the reconstruction and resettlement. The cold war which divided the world into two halves made this task tougher as all the issues were interpreted in the world politics through the prism of East or West. That was the reason that in spite of India's serious effort to get help from either side it could not achieve any milestone in the development of nuclear technology. Though India's nuclear programme continued to run and India tried to cooperate with other countries to access this cutting edge technology.

Concept of "cooperation" in international relations

Cooperation is a very wide term. When used in international relations it denotes various pulls and push factors which lead to some particular decisions taken by two negotiators serving interests of both sides. Cooperation between two countries is the result of intense negotiations which is opposite to "conflict". As per the game theory³ the negotiations between two international actors may result in disproportionate pay-offs for individual countries. This may result in unwillingness on the part of the less gaining country to enter into any kind of negotiations. It is also not certain that all the negotiations will result into disproportionate results. The long term benefit may encourage even those countries to negotiate, whose immediate pay-offs may be less. Secondly, it is also not sure that all the negotiations will result in some sort of cooperation. They can fail thus complicating the situation further. But one thing is sure that for any cooperation between the states the compatibility of interests is needed which will lead to the dilution of any hard-line approach on the part of any party to the negotiations.⁴ (Baylis and Smith 2006, 126-27).

Indo-Russian nuclear cooperation is an example of this compatibility of interests. The cooperation between them seems to be more in line with the existing political situations as well as the ground realities. This cooperation can form a solid block in near future to emerge as new power equation in the world politics. As both India and Russia are working towards a trilateral group bringing China into the fold, this cooperation seems to be more realistic than the earlier cold war era cooperation which was more ideologically driven. Today "realpolitik"⁵ is driving India and Russia towards a better relationship which is influenced by many other factors.

The nuclear cooperation is a win-win situation by both India and Russia as they are less concerned about the disproportionate advantage gained by the other country while dealing with each other. Theoretically the actors in international politics are concerned not only with absolute advantage but also with relative advantage. This is also true in case of India and Russia. But what is different in their case is that they view each others interests complementary than competitive. Perhaps that is the reason why we find more points of convergence than that of divergence in their mutual relationship.

Beginning of India's nuclear programme

India's atomic programme began in 1948 with the establishment of the Atomic Energy Commission. It was the vision of India's great scientist Dr. Homi Jahangir Bhabha. In fact Bhabha was the first Indian who visualized an India with credible nuclear capacity. His vision was duly supported by India's first Prime Minister who was also a great advocate of science and who believed in the power of science to change the socio-economic status of poverty-stricken country. Dr. Bhabha was appointed the head of the Atomic Energy Commission. He was also the scientific advisor of India's first Prime Minister Pundit Jawaharlal Nehru. Bhabha was instrumental in the formation of India's apex nuclear body which was responsible for decision making regarding atomic programme. The "Tata Atomic Energy Commission" was incorporated in August 1948. This was later renamed as "Bhabha Atomic Research Centre". But progress in this direction could be made only after the establishment of the Atomic Energy Institute at Trombay in 1954.⁶ In the initial period India didn't have the technical know-how to proceed in the area of nuclear research. Thus India tried to get the external help and technical support from developed countries. But the exclusive club of the nuclear power states was not willing to help India though the first reactor built in India was a Light Water Reactor built by General Electric of USA in 1969 with 320 Mwe capacities (CIRUS).⁷

India's nuclear programme began with the objective to gain self-sufficiency and not to be dependent on any block which might force India to compromise with its newly gained freedom and independent foreign policy. Later on many other factors helped its further growth. One factor that expedited India's nuclear research programme was the clandestine nuclear weaponisation of Pakistan after its military defeat in 1971. In this context, it is worth mentioning the famous quote of Pakistani Premier Z.A. Bhutto that Pakistan will eat grass but develop its nuclear bomb. This left India with no choice but to expedite its own nuclear programme. India by then had expanded its research and power reactor programme which included reactors built indigenously without any external assistance like the one at Kalpakkam, near Madras. Keeping in mind the security threats being faced by India at the strategic level, Mrs. Gandhi authorized the conducting of an under ground nuclear test which could justly be described as a dual purpose experiment. The explosion of the nuclear device would constitute an experimental basis for the peaceful purposes of a technology demonstration experiment for the peaceful uses of nuclear energy. Dr. Homi Sethana and Dr. Raja Ramanna were senior scientists of the Indian department of Atomic Energy who conceived and conducted the Indian nuclear test in the Pokhran desert in Rajasthan on May 18, 1974. India successfully managed to keep the plans for this nuclear experiment confidential till it actually took place.⁸ (Jaina and Mathur, 2000)

Chinese nuclear programme also forced India to look for nuclear option. In fact, Chinese nuclear programme has a long history. After the communist victory in China in 1949 the intensity of cold war heightened. Communist victory in China was a victory of Soviet block and China openly joined cold war politics after its involvement in Indo-China war. China started its nuclear programme in 1949 itself. It tested its nuclear device in 1964. China had attacked India in 1962 and forced India to abdicate a large part of its territory which is still under Chinese control. Thus, India's relationship with China was very strained. China's conventional military superiority left India with no choice but to go nuclear. As China was already a nuclear power India had to acquire this technology as a deterrent for its own security.

Thus, India's nuclear programme continued to run but with great difficulties. For a newly independent country which had been exploited for centuries by colonial powers and left with mass poverty and deprivation, it was no less than a feat to develop such a complex technology on its own.

India's 1st peaceful nuclear explosion in 1974 and Russia

Meanwhile, India's nuclear programme continued under severe adverse conditions and at last Indian scientists proved their mettle by conducting a nuclear test on May 18, 1974. The nuclear test was given the code name "Smiling Buddha". Thus Buddha smiled, and the whole world shook with disbelief and apprehensions. The explosion was the result of long ongoing nuclear research and was precipitated by Chinese nuclear explosion in 1964. China's nuclear status and belligerent and antagonistic attitude towards India was largely responsible for pushing India to the threshold, and thus undertake such risk. Furthermore the indirect complicity of China in Pakistan's nuclear programme was also evident for India. This was the defining moment for India's relation with not only Soviet Union but the whole world. The western countries pointed out the complicity of Soviet Union in India's nuclear test but it was completely indigenous effort and no proof was found to suggest any open or hidden Soviet cooperation in India's nuclear tests. But the explosion opened the eyes of the western powers and this led to the formation of NSG.⁹

Apart from the Chinese concern other factors like India's belligerent neighbors, their open antagonistic attitude towards India, India's internal problems like the militancy in the North-East and external support to that, cold war politics and USA's anti-India stand in regional and international affairs etc were also responsible for India's first atomic weapon testing.

As expected, developed Western countries put sanctions against India and those cooperating in any manner with India stopped further cooperation. There was a furore amongst the nuclear weapon powers of the West about India's experiment. As

anticipated, Pakistan took full advantage of this experiment to justify its own nuclear weaponisation programme regardless of the fact that it had commenced its clandestine weapons programme three years earlier. In fact, Soviet Union was not quite happy with the test. Soviet Union not only expressed concern about the nuclear proliferation but it also realized the difficulty in stopping Pakistan from doing the same and the involvement of outside powers in proliferation in the region. Moreover, the test also signaled the increasing assertion of India in international relations. The nuclear test also heightened the rivalry between two super powers as it became a part of the cold war politics.

1974 nuclear explosion had a significant role to play in India's relationship with the West. It created a kind of rift between India and Western block and drove India closer to the Soviet Union. Since Soviet Union took more realistic steps after the explosion it signaled some change in the power dynamics in South Asia. On the other hand, it completely threw Pakistan into the clutches of China, which extended its hidden collaboration to Pakistan in its nuclear programme. This test became a new concern for the P-5 who was until then the sole owner of the nuclear weapons. Thus it also led to the tightening of the nuclear regime in the world.¹⁰ (Dixit 2002, 217-18)

The modest beginning of India's nuclear ties with Russia

Indo-Russian nuclear cooperation is a recent phenomenon. In the initial period Russia was not very keen to cooperate with India in the nuclear area though they were virtually allies during the cold war period. Russia's unwillingness to supply nuclear technology to India was the result of Russia's obligation as a member of NPT and its desire to maintain its exclusive status as a member of nuclear club. There were some other factors which were also responsible for that kind of Russian approach. The East-West rivalry was the sole determinant of the international relations at that time. Though India and Russia maintained very cordial relationship in other fields like defense they had hardly meaningful cooperation in the nuclear field. After the signing of Indo-Russian friendship treaty in 1971 both the countries moved closer. This treaty is sometimes referred to as a sign of India joining the Soviet camp by some experts. But the nuclear cooperation between both the countries remained out of bound. India's nuclear programme continued to run on indigenous support.

After India conducted its first nuclear explosion in 1974, Soviet Union criticized India's action. The response of Soviet Union, though not vocally as critical as that of US, Moscow had reservations about India acquiring nuclear capacities of this level. In fact this explosion led to the change of policy on the part of Moscow and the imposition of restriction by Western countries also propelled India to look towards Russia for any cooperation in the nuclear field. As a result of this testing Canada stopped supplying nuclear reactor and nuclear fuel to India. It was in the wake of these restrictions that Soviet Union stepped in. The Indo-Russian nuclear cooperation began in September 1976; when Soviet heavy water was supplied to the second unit of the Rajasthan Atomic Power Station (RAPS) as a result of Canada stopping all heavy water supply to it. It took two years of negotiations to reach the agreement, as Moscow was insisting on stringent safeguards to ensure that there was no clandestine diversion to non-peaceful activity. Russia's tough bargaining took place in spite of Moscow endorsing the conduct of peaceful nuclear explosion by India in May, 1974.

The nuclear cooperation between India and Soviet Union became tougher after India exploded its first 'peaceful nuclear explosion'¹¹ as India called it, on May 18, 1974. The international community especially the P-5 (Permanent members of the security council namely USA, USSR, UK, France and China) was petrified and as a result these countries imposed sanctions against India. Moreover they set up an organization called Nuclear Suppliers Group (NSG) to deter any further proliferation of nuclear technology. They also tried to pressurize India to sign NPT (Non-Proliferation Treaty)¹² as a non-nuclear state disbanding its nuclear program which obviously India rejected. NSG consists of 45 members who are mainly the suppliers of the nuclear materials. NSG seeks to control export of nuclear materials, equipment and technology both of dual use and that specially meant for nuclear weapons development. In 1978 NSG issued a set of guidelines for nuclear transfers that then did not entail the application of full scope safeguards for nuclear exports to non-nuclear states. This provision was incorporated into the guidelines of NSG only in 1992 after the discovery of the clandestine nuclear program being pursued by Iraq.

The result of the formation of NPT was not at all desirable for Indian nuclear program. The treaty divided the states into two categories: Nuclear Weapon States (NWS) and Non-Nuclear Weapon States (NNWS). While all kinds of nuclear trade and transfer of nuclear technologies are allowed amongst the NWS, it is completely banned for NNWS. The treaty justifies the possession of nuclear weapons by those states that tested the nuclear device before 1968, the year of the signing of the treaty. Since all the permanent members had tested their nuclear devices before the treaty was signed, they became the legal holders of the nuclear weapons. India was defined as a non-nuclear state thus it was given an option to get nuclear technology for peaceful uses provided Delhi signed the treaty. The discriminatory nature of the treaty was opposed by India but without much success. As a result, India refused to sign the treaty.

The formation of NSG was another blow to the India's nuclear program. NSG made it mandatory for its members not to trade in nuclear technology with any non-nuclear state. It also made it necessary for any supplier to bring NSG consensus before such transfer of nuclear materials or technology. With Russia being a member of the NSG it is these clauses of NSG that stand in the way of Indo-Russian nuclear cooperation since India does not accept international Atomic Energy Agency Safeguards over its indigenously developed nuclear facilities. As these responsibilities emanate from Russia being a member of these organizations, any meaningful cooperation depended on the broader policies taken by both these organizations.

Even before the formation of NPT or NSG, Soviet Union was not enthusiastic about helping India in its nuclear programme. USSR's unwillingness in the initial years to help India with technological and logistical support can be attributed to two reasons-

Firstly, USSR was not sure about India's stability both internally and externally. Internally, the newly independent state was in shambles both economically and socially. The large-scale violence during the closing years of the British rule and the serious socio-economic problems were frightening many political observers in the West.

Many scholars had predicted the imminent collapse of India and this worried Soviet Union as well.

Secondly, Soviet Union considered India as a stooge of Western powers. Nehru's government was perceived as a bourgeoisie government and Congress Party as the agent of capitalism. The decision of Nehru to keep India as a part of British Commonwealth buttressed this view of Soviet leaders. Thus, Soviet Union remained apprehensive about India. No cooperation in the nuclear field was possible under such mistrust. This explains the cold shoulder attitude of USSR for India's nuclear programme in the initial years.

It was only in the wake of Chinese attack on India in October 1962, and the war with Pakistan in 1965 that Indo-Russian relationship started changing for better course. The war with China was an eye-opener for India. The country which had long neglected the defense sector and was at the forefront of the nuclear disarmament and non-proliferation campaign was forced to look out for a credible minimum nuclear deterrent and better cooperation with both the superpowers of the time.

Indo-China war not only accelerated India's nuclear research programme but it also forced India to seek technological support from outside, and USSR was the obvious choice as the rift between USSR and China began to appear. This growing rift between USSR and China was largely responsible for the changing attitude of Soviet Union vis-à-vis India. After the demise of Stalin the rival claim for the leadership of the communist world created the rift between China and USSR. Moreover the concept of peaceful coexistence enunciated by Soviet leadership contributed to the rift. Chinese leadership started to criticize it as revisionist policy and they started attacking Soviet leaders by calling them 'revisionist'. As China's power and influence grew in international relations the leadership of the communist world became a hot issue. China tried to dislodge the USSR from the leadership position, thus widening the rift between these two communist countries. Nixon's secret visit to China in 1971 was the last nail in the coffin of the Sino-Soviet relationship. China became closer to USA.¹³ Thus USSR was forced to look out for new partner to regain the balance of power in the highly volatile world politics.

Then, a war broke out between India and Pakistan on the issue of Bangladesh in 1971. India intervened in the war from the side of the Bangladeshi freedom fighters and this resulted in full-scale war between the two neighbors. Pakistan lost the war and was forced to concede the independence of Bangladesh. In this war United States openly supported Pakistan and even sent its seventh fleet to the Indian Ocean. It was a precarious situation when USSR came to the rescue of India and severely warned United States against any reckless action. It was the Soviet threat which held US back during the war. Soviet Union also helped India by supplying military hardware and equipment.

Another factor which propelled USSR towards Delhi was India's stature as the leader of Non-Aligned Movement (NAM). Non-Aligned Movement was started by three world leaders, Nehru (India), Marshal Tito (Yugoslavia) and Col. Nasser (Egypt).¹⁴ The main purpose of NAM was to provide a third front to the developing countries so that they could follow their independent foreign policy in a world which was clearly divided into two parts. Thus NAM countries repudiated to join any group and thus maintain their freedom in world affairs. India as the leader of the grouping was very influential in developing countries which could have tilted the strategic balance in favour of any group. Russian policy makers did not fail to grasp this. (Jaina and Mathur, 2004)¹⁵

Other factor was ideological. Nehru always appreciated socialism. He had visited Soviet Union several times even before India's independence. He was deeply impressed by the way in which Soviet Union had solved the problem of poverty and unemployment. Time and again he confessed his Marxist leanings. Though he was also impressed with the western values like liberty, freedom, and democracy, he considered socialism as the best way to resolve myriad problems of the newly independent third world countries. Thus, he always felt closer to the Soviet Union.

All these factors led to better understanding between India and Soviet Union. These considerations did change the perception of Soviet Union on India to some extent. Though for any sort of nuclear cooperation a further spurt in their relationship was needed.

Pokhran II and Russia's response

Pokhran II was the name given to India's second peaceful nuclear test in 1998. This test was the result of emerging threat perception to India's security. The tense relationship with Pakistan and the collusion with China was a constant threat for India. India's nuclear explosion caught Moscow, like other world capitals, unaware. Indeed a Russian Foreign ministry spokesperson even regretted that India, being a friendly country did not bother to inform Moscow about its intentions. However, Russia's reaction was swift. On 12th May 1998 President Yeltsin publicly expressed his anguish and declared that "India has of course let us down over their nuclear explosions". (Zafar Imam, 2001)¹⁶ On 12th May Russian Atomic Energy Ministry official expressed regret over India's carrying out yet another nuclear test after 1974. The same day the foreign ministry issued a statement: "The three nuclear tests carried out in India on 11th May pushed the world towards the proliferations of the nuclear weapons and created additional difficulties for further reduction of nuclear weapons", and it expressed the hope that such a policy by India will not cause a chain reaction in South Asia and beyond. The statement concluded that this action caused deep regret in Russia, a very close friend of India. (Olopally, Deepa, 2001, Strategic Analysis)

Foreign minister Primakov in an NTV interview emphatically stated: 'we do not like it (nuclear explosions). Naturally, we are against them because India is upsetting stability that has taken shape in the world now in preventing nuclear explosions in general, both underground and so on. We would like very much, that India being our friend and partner, stop and not go any further'. Asked how serious the danger of an India-Pakistan conflict, Primakov's reply was: "The danger is serious now. We would not want Pakistan to follow in India's footsteps. We shall now be doing everything to somehow prevent, if you like, a possibility of such thing being repeated." (R.R. Subramanyam, 2001, page 83-84)¹⁷

However, the Russian Duma came out with quite a different reaction than that of the Kremlin. The Chairman of the State Duma, Gennady Seleznev, offered his support to

India: 'I believe that India acted correctly. In this respect, it acted very consistently and it was a correct decision not to curtail its research programme half-way, in spite of US pressure I can only admire their national pride.' The arch nationalist and the leader of the Liberal Democratic Party, Vladimir Zhirinovsky was lyrical in his backing of the nuclear tests by India, While Communist Party leader Gennady Zyuganov was also reported to have expressed his happiness.

Russia also joined G-8 leaders at their Birmingham summit in May 1998 in calling upon Pakistan to show maximum restraint. However, when Pakistan exploded its own nuclear devices on 28th May 1998, the foreign ministry expressed its deep regret and concern.

After such initial reactions the contours of a policy gradually began to emerge from the foreign ministry as well as the Presidential office, a policy which remained in operation till Vladimir Putin came to power. The main characteristics of the policy were-first, like the USA and its allies there was an unqualified condemnation of India's nuclear tests, including those of Pakistan. Second, there was a firm opposition to US and Western policy of imposing sanctions, particularly on India. Third, India should stop further nuclear tests, revise its nuclear policy, and sign the NPT and the CTBT.

Further, there was a renewed realization that India and Pakistan must resolve their dispute through negotiations. Russian Foreign Ministry spokesman Valery Nesterishkin announced on 2nd June 1998: "Moscow is interested in preventing the escalation of tensions between Delhi and Islamabad in neutralizing the dangerous consequences of the nuclear tests carried out by these two countries." (Summary of World Broadcast, BBC, June 3, 1998)¹⁸

President Yeltsin was in touch with the Indian Prime minister and spoke to him on telephone during May and June 1998 on the nuclear issue and expressed opposition to US sanctions. It was also then reported that Russia had urged both India and Pakistan to stop the nuclear programme and sign the NPT and CTBT. Yet it was repeatedly emphasized in Moscow that nuclear cooperation for peaceful purposes with Delhi would continue

despite India's nuclear tests. Russian Atomic Energy Minister Adamov made this plain in a statement on 18th May 1998. A few months later he came to Delhi to hold talks on the future of such cooperation. (Ibid)¹⁹

Thus, it appears that Russia's opposition to nuclear explosions was certainly emphatic, but unlike the USA and the West it was mute. So much so that Russian media reported the satisfaction of the Indian Prime Minister's office over Russia's attitude. The emphasis remained on continuation of the existing relations, particularly stepping up of arms supply to India. Russia's opposition to economic sanctions on India must be seen in the light of its desire to sell arms to India. Since Russia is the largest arms supplier to India it could not afford to lose such lucrative market. While the entire international community appeared to rise in unison in condemning India for its nuclear tests; the Russian stance was certainly a relief to Indian policy establishment. On the other hand Russia's restrained criticism of India's nuclear tests must also be seen in the context of the then ongoing efforts in the Russian Foreign Ministry for promoting a balanced policy between East and West under the direction of Foreign Minister Primakov.²⁰ Notwithstanding the above special circumstances and compulsions of both the sides, the crisis created by India's nuclear explosions was no more than a temporary episode in the long cherished relations between India and Russia.

Yet in essence Russia's immediate response to India's nuclearization, and its policy later were in tune with US views on it. Like the US, India's reported security concerns for conducting nuclear tests remained totally linked to India-Pakistan relations vis-à-vis Kashmir alone, while the China factor was not taken seriously. India took the step keeping in view its strained relationship with China, and the continuous threat perception due to China's repeated claim over Arunachal Pradesh was more or less ignored by Russia or other countries. Also like the USA, Russia wanted India to stop further nuclearization except for peaceful purposes and to sign the NPT and CTBT. It also refused to recognize India as a nuclear power and showed distaste for India's desire to act as a nuclear military power in global and regional politics.

Koodankulam and beyond

The next stage in our nuclear cooperation came in 1988 when the inter-governmental Agreement on Koodankulam project²¹ was signed on November 20, 1988 by Indian Prime-Minister Rajeev Gandhi and Soviet President Mikhail Gorbachev. However the collapse of the Soviet Union in 1991 delayed the implementation of the agreement. Also wrangles over costs to be paid in foreign exchange and American objections raised after the Gulf war in 1992 significantly delayed the implementation of the agreement. The project remained in limbo for ten years due to the unstable nature of Russian state and excess Pro-Atlanticism of Russian president Boris Yeltsin. The lack of political will remained a stumbling block in the way of their relationship. American bullying tactics worked and Russia-India nuclear cooperation was put on hold. On June 21, 1998 a supplementary agreement was signed by Russian Minister for Atomic Energy Yevgeny Adamov and India's Atomic Energy Commission chairman Dr. R.Chidambaram after protracted negotiations.

Under the first agreement Koodankulam was to be a turn-key project with the Nuclear Power Corporation (NPC) providing the site for the project. The then USSR was to provide the design of the VVER1000 type pressurized water reactor (PWR). It was to bring the fuel, equipment components and the spares and build the reactors. Under the supplementary agreement which was a technical one Russia was to give NPC the design and supply most of the equipments for setting up of the plant.

Koodankulam nuclear power plant is the symbol of new emerging reality in Indo-Russian cooperation. As mentioned earlier Koodankulam nuclear power project, signed in 1988, remained in the cold storage for almost ten years. The project gained momentum after the visit of Russian President Vladimir Putin in October 2000. That visit led to an agreement on Indo-Russian cooperation in the peaceful uses of atomic energy. Before the visit of President Putin, on September 29, 2000 Mr. Reshenikov, the Russian Deputy minister for Atomic energy pushed a nuclear fuel bundle of natural uranium into the fuel vault of the fourth reactor at RAPS.

The Russian delegation headed by Mr. Reshenikov included some of the world's best nuclear scientists and technologists. Their arrival ahead of President Putin was significant. Nuclear cooperation in the peaceful use of atomic energy was firmed up. After the visit to RAPS Reshenikov made it clear, that four more units of the VVER type reactors of 1000 MWe capacity would be set up at Koodankulam. He remarked that from the economic point of view it is viable to have four units at the same site if not six.

With the Koodankulam project India and Russia have entered in new phase of nuclear cooperation. The construction of the Koodankulam reactors with the help of the Russian Federation would improve electricity generation and availability of advance technology for India's energy sector.

Dr. Malyshev, a significant nuclear expert, has opined that VVER 1000 type reactors planned for Koodankulam would have additional safety features compared to the prototype made in Bulgaria. Russian nuclear power stations rank third in terms of safety after Japan and Germany. Russia was building 2 VVER type reactors in Iran and China also.

A major feature of President Putin's visit to India in 2000 was his trip to the Bhabha Atomic Research Centre on October 5, 2000. This was indeed a significant development. It signaled the support of a major head of state for strengthening Indo-Russian relationship. However, some points of divergence between New Delhi and Moscow on the issues of nuclear non-proliferation remained.

The Russian federation, the successor state of the Soviet Union that continues to be a member of NPT regime is also a member of the Nuclear Suppliers Group (NSG). The NSG is concerned with nations that export nuclear technology to countries outside the NPT framework too.

At the April 3, 1992 meeting of 35 nations that constituted the NSG, it was decided that as a consequence of Iraq attempting to develop nuclear weapons, it was necessary to

strengthen the safeguard system so as to prevent any more nuclear states from engaging in clandestine non-peaceful activity. They decided to adopt full-scope safeguard that would be triggered of a country that wished to import nuclear technology from a state that is the member of NSG.

Russia at that time refused to comply with the comprehensive safeguard system proposed by the NSG members even though its predecessor the Soviet Union might have been party to it at the Hague meeting in 1991.

India as a non-signatory to the NPT has resisted all attempt to impose “full scope safeguards”²² on its nuclear activities. Russia was able to implement Koodankulam agreement without insisting on full scope safeguards due to the deft handling of the case in the NSG and its own tough posture in the international politics. Since the NSG guidelines allowed for limited safeguard that apply to the plant transferred alone it could come true and the international community did not insist on IAEA safeguards.

It is important to bear in mind that the NSG guidelines are to be implemented by each NSG member in accordance with its national laws and practices. Decision on export applications are taken at the national level in accordance with national export licensing requirements. Also the NSG guidelines do not mention anywhere the NPT and hence do not define what it meant by a nuclear weapon or non nuclear weapon state.

The Russian laws also do not define anywhere in their national legislation what is meant by a nuclear weapon state. In fact it is the US alone where the domestic legislation, the Nuclear Non-proliferation Act of 1978 and 1994 define states according to the NPT regime.

Russian President Putin during his visit urged India to sign the comprehensive test ban treaty (CTBT). India has in any case stopped further nuclear testing since May 1998. Putin made his plea on the CTBT²³ in a meeting with the scientists of the Bhabha Atomic Research Centre in Trombay near Mumbai. He did however appreciate the Indian stand that its natural interests and the need of its people should also be considered. Yet Putin felt it would be better for India if it were to sign the CTBT.

There are some differences between Moscow and New Delhi on nuclear non-proliferation and arms control issues. India's call for universal disarmament is not supported by Russia. Russia is in favour of the arms control but does not support the Indian call for the complete elimination of nuclear weapon. It understands the international concern about the nuclear weapon but is not willing to leave its nuclear status. It wants India to join NPT and CTBT. It also wants India to adopt nuclear disarmament but is not in a position to provide any guarantee to India's security.

Russia and China are two major powers who are both members of the UN Security Council as well as members of the NPT regime. Their strategic cooperation on military and nuclear issues is necessitated by the need to reduce tensions and concentrate on economic development. Russia favoured the emergence of a Russia-China-India triangle of cooperation. The idea has yet to take concrete shape because neither India nor China would like to be freed from the bilateral arrangements that presently exist with the lone superpower United States.

It is unrealistic to expect the triad of these countries to discuss the sensitive nuclear issues. In any case, Russia was party to the Resolution passed by the UN Security Council which called on India to desist from further nuclear testing and immediately sign the CTBT.

China favors India's adversary Pakistan as a strategic partner, and New Delhi has often cited China as a threat. At another level, it must be pointed out that the United States as the sole super power has sought to object before the nuclear suppliers group to any further Indo-Russian nuclear cooperation in the peaceful uses of nuclear energy. In March, 2000 the Russian Minister for atomic energy (Minatom) Mr. Yevgeny Adamov announced that Russia planned to export five more nuclear reactors to India. As was mentioned earlier in 1992 the NSG had changed its rules in response to the 1991 gulf war and had decreed that no member state including Russia could supply any nuclear equipment on NSG list to any non-nuclear weapon states unless all its activities are subject to IAEA's full scope safeguards. This means that the US in talks with Russia in Moscow held that Russia was barred from selling nuclear reactors to India which was not a party to the NPT.

When the Russian Federation resuscitated the original May, 1998 agreement with India after the collapse of the Soviet Union, it had argued that Minatom's agreement to sell two VVER reactors to India was covered by an Indo-Soviet bilateral cooperation pact which predated the NSG decision. The US objected to that position in bilateral talks but finally accepted the Russian position before the NSG.

It was always clear that Washington will not accept any new claims by Moscow that the Indo-Soviet nuclear accord sanctions sale of additional reactors to India. USA remained categorical that the NSG would allow more VVERs to be sold to India only if it puts its entire nuclear program under IAEA safeguards.

The present priority of Russia

The changing dynamics of world politics has generated new challenges For Russian foreign policy. Russia is trying to grapple with the situation with multi-pronged strategy. Its relationship with United States does not seem to be very cordial. Instead, the cold war mind-set seems to have affected this relationship. No doubt, Russia is trying to cope up with the situation with new strategies. At present Russia's priority in India's nuclear sectors are threefold-(Sergev Kiriyyenko 2007)²⁴

1-Koodankulam project completion-

Koodankulam project is the most visible symbol of nuclear cooperation between India and Russia today. The current priority of Russia is to successfully complete the Koodankulam project where Russia is installing four 1000 MW capacity light water reactors. This project, jointly executed by Nuclear Power Corporation of India Ltd (NPCIL) of India and Atomstroy Export (ASE) of Russia is a glaring example of budding cooperation between India and Russia in nuclear field. ASE is the nuclear plants and systems exporting arm of the Russian Atomic Energy Agency (Rosatom).The Koodankulam nuclear power station built with the most advanced Russian technologies is an example of fruitful cooperation between India and Russia and provides both with invaluable experience of interaction.

2-Unifying common goals-

Development of nuclear power engineering is a priority for Russia. Russian President Vladimir Putin has repeatedly stressed the significance of nuclear energy. In fact, it has become quite evident that nuclear energy has a very important role to play in the growth and sustenance of world economy. It has become vital and one must take maximum efforts to make it safe. The problem of global energy security was widely discussed at the G-8 summit in St. Petersburg in July 2006.

The energy issue is highly topical in India. Development of nuclear sector has had priority significance ever since India gained political independence, and under the plans of the Indian government the installed Indian nuclear capacity are scheduled to grow up to 40 gigabytes by 2025. Russia possessing vast scientific and technical potential and more than 50 years experience of building nuclear power stations is making its contribution to Indian energy stability, accentuating safety of nuclear reactors in construction of two units at Koodankulam.

3-Safety as first priority-

The Koodankulam nuclear plant uses a Russian designed third generation reactor meeting all international requirements for modern nuclear stations. The AES-92 project of Russia developed by the Alomenergo-proyekt institute jointly with Kurchatov institute, OKB Gidropress and other leading enterprises in Russia's nuclear sector includes construction of two VVER 1000 water cooled energy reactors and has improved security. Koodankulam will have a device for picking up, cooling and localizing the core melt that is located under the body of the reactor. It will have a protection system against earthquakes, hurricanes and aircraft impact. Two energy units under construction on the Indian Ocean coast are imperious to Tsunamis: as especially designed breakwaters successfully dome the waves. This security mechanism is in line with the modern safety measures and approved by the nuclear watchdog International Atomic Energy Agency. Safety issue has become more important after the Chernobyl incident that took place in Ukraine. The incident resulted in widespread death and destruction and heightened the concern about the safety of nuclear power plant. Indo-Russian nuclear cooperation is keeping the security issue in the focus to avoid any disaster in the future.

4-A look at the future-

Russia and India are poised for further cooperation in nuclear power engineering. The main goal of cooperation at this point in the Koodankulam nuclear power plant project is to commission the first and second power generating units. Russia and India have the required potential and technological capacity to successfully complete the plant's construction as well as to actively develop nuclear power engineering in India. The project is progressing well and both the countries are looking towards further cooperation. Russia is willing to sell more reactors to India after NSG changes its rules allowing India to get nuclear supply from outside. Once the Indo-US nuclear deal comes through, the Indo-Russian nuclear cooperation is expected to rise much higher than it is today.

Chapter Two

*RUSSIA'S STRATEGY IN
SOUTH ASIA*

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Indo-Russian nuclear cooperation is a multidimensional issue. Right from the pre-independence era of Indian history when Russia was under the czarist rule the North West frontier province was the point where the clash of interests between British India and the Russian empire often took place. It was the Russian threat of expansion in the region and the British over sensitiveness which caused the rupture in their relationship time and again. Russia's "imperial design" was often checked by the pre-emptive strike of the British in the region. Thus "Russo phobia"²⁵ (Lyaal, Alfred 1932) as it is called sometimes was the determinant of British policy during 19th century. In fact Russia's own security was very much related to the security of its frontier areas in Central Asia. After the Second World War Central Asian region became the hotbed of cold war politics which spread up to the South Asian region. Thus South Asia became the extended zone where cold war politics began to be played. Pakistan's joining the western camp completely embroiled the region in the great game. India's independence in 1947 gave birth to new geo-political dynamics in the region. Though India declared Non-Alignment as the cardinal principle of its foreign policy, it maintained very close ties with the Soviet Union. India's policy of NAM was severely criticized in the western media. In US it was even termed as "immoral neutrality"²⁶ (Dulles, John Foster 1968). The Indo-Soviet Treaty of Peace, Friendship and Cooperation, which was signed in 1971, were criticized as a defense pact with Soviet Union by some western scholars.

Though India did not accept those criticisms, it maintained cordial relationship with USSR. This all round development of their relationship was factored to some extent by the compulsions of cold war politics. No doubt the national interest was also an important determinant. Today when the cold war is over new forms of threats are emerging in world politics, especially in South Asian Region, which has its repercussions for Russia and India both. Thus it's not surprising that both countries are trying to find newer common ground to come closer and cooperate with each other.

Indo-Russian nuclear cooperation is the culmination of their old relationships which is necessitated by the growth of Indian economy in the last decade of the 20th century. Apart from this it is also spurred by various other factors. To cooperate in an area which was

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more or less prohibited by international community is the result of Russia's well thought out plan in the region. Russian strategies in the region are two pronged. While some are to serve the regional interests others are more global in nature.

Historical factors driving Russian policy in the region

Russia and India are facing some common challenges in the region. The nuclear cooperation is the part of larger strategy to tackle those challenges. Russia has been a significant stakeholder in the region since time immemorial. Russia's geographical proximity to the region and its historical ties with India began from very ancient time when Aryan emigration to India from Southern Russia started a process of interaction between both the regions. In course of time despite some breaks and the discontinuity in their ties they are still closer from civilizational point of view than any other two civilizations. Both the countries are striving hard to generate opportunity for each other in various sectors including the nuclear one which is a positive development of 21st century world. This age old relationship generates enough compatibility between them which both of them are ready to harness in various ways. Today, when the world is completely different from what it was 100 years ago India and Russia are finding new avenues to reach a common platform to face the new emerging challenges which affect both of them more or less in a similar manner.

Growing US influence in the region

America's aggressive foreign policy and its hidden imperialist design is a new challenge for Russia who still considers itself as a major stakeholder in the region. American unilateralism and its pursuit of power projection all over the world are not acceptable to Russian policy makers who still claim to be a super power in world politics. USA is taking unilateral decision in its war against terrorism. Russia often feels segregated in international politics due to the bullying tactics of United States. It was quite evident when USA attacked Afghanistan in the wake of terrorist bombing of world trade centre or at the time of US attacks on Iraq. In fact US involvement in the region is not new. It all began in the cold war era when Afghanistan became the battleground for both the super

powers to establish their hegemony in the region. Russia, which has always been sensitive about its stake in the region which stretches from Central Asia to South Asia, felt a strategic threat due to those developments in the region. USA's aggressive move in the region to reduce Russian influence and thus enhance its own was not acceptable to Russia. Due to its geographical proximity Russia always views South Asia as its backyard. Any American activities in the region were sure to arouse Russian concern.

After 9/11,²⁷ America got a readymade pretext to increase its receding presence in the region. It formed an alliance, roped in Pakistan and started a war against terrorism. No doubt terrorism is a real threat to mankind and it needs to be eliminated. So America could easily form a coalition of the willing. But what irks Russia is that in the name of fighting terrorism America set up its base in the region and refused to vacate even after the removal of Taliban. Though American argument that any withdrawal from the region will only jeopardize the weak Afghan national government and that the war against terrorism is still incomplete cannot be easily rejected, its great power interests also get exposed as it has made Pakistan an ally in this war though Islamabad is widely considered as the root cause of Islamic militancy and ensuing terrorism all over the world.

It was not only Central Asia but Indian subcontinent as well, where Americans have filled up the power vacuum created by the disintegration of Soviet Union. It was widely believed that Americans were supporting the monarchy in Nepal. Down to South America is also assisting Srilankan government in its war against LTTE. With India USA has improved its relationship tremendously. As long as Russia remained embroiled in its own problem it could not think of regaining the political landscape. But after the arrival of Vladimir Putin and the leapfrogging of Russian economy, thanks to the record oil prices, Russia emerged again as a serious contender for the power position in the Indian sub-continent.

It is more than evident that the new American 'Pax-Americana' policy has its own plan to establish its hegemony in the world including South Asia. The war against terrorism has given a new weapon in the hands of the USA to justify its aggressive policy. The overthrowing of Taliban from Afghanistan and the American insistence on not to vacate

the region has shown the true character of American war against terror. By making Pakistan an ally in this war Americans have given double jolt to Russian interests in the region. Russia and India are cooperating to offset this tilt in the balance of power by cooperating with each other. Russia's desire to improve its ties with India can be viewed in this context.

American involvement in the region is also growing economically. It is India's largest trading partner today. US is seriously eyeing on Indian arms market which was a near monopoly of the Russian firms till very recently. The prospect of losing out this market to Americans is not less than a nightmare for Russians. Though Russia is still the supplier of more than 70% equipment to Indian army its share is definitely on the wane. (The Times of India, December 26, 2006)²⁸ On the other hand India is gradually diversifying its sources of arms supply so as to procure the best weapons at competitive cost. Thus Russians cannot remain complacent to its present state of relationship and must diversify its trade basket vis-à-vis India.

It is highly unlikely that any cooperation between India and Russia in the nuclear sector can tilt the balance of power in Russia's favour. Instead the whole Indo-Russian nuclear cooperation depends on the support of United States. Merely selling some nuclear reactors cannot be the basis of strong nuclear cooperation. Any transfer of high-end nuclear technology and nuclear fuel supply need a drastic change in the whole nuclear regime which can be possible only with the help of United States. But Indo-Russian nuclear cooperation in the recent past has definitely added a new feather to India-Russia relationships which symbolized their new found confidence due to their recent rise in international politics.

Russia's economic and commercial interests

Second factor which is driving Russian policy in the region is economic and commercial one. India is emerging very fast as an economic giant in the region. Before 1991 India's closed public sector economy was overregulated and severely restricted for outside investors. The license-quota-permit raj²⁹ had sapped the vitality of Indian economy and

left it in a limbo. India was pushed to the verge of economic collapse and bankruptcy. The severe balance of payment crisis forced India to mortgage its gold reserve with the Swiss bank³⁰. This led to the opening of Indian economy in 1991. This was a path-breaking moment of Indian history. Within years Indian economy started to pick up and at the end of 20th century Indian economy achieved the growth rate of 7-8% per annum. Today Indian economy is growing at 8-9% which is the second fastest growth rate after China.³¹

The significant growth of Indian economy has attracted worldwide attention. Today a large number of foreign investors are investing in India as it provides one of the best growth opportunities for these companies. It's not only the better business environment but there are other opportunities available in India. It's billion plus population and rapidly growing middle class provide one of the biggest markets in the world. This huge market can be a ready outlet for Russian goods and services. Russia is trying to get its share of this huge market.

Moreover the developing nature of Indian economy also gives enough scope for Russian investors to invest in various sectors. India's growing need for energy and its focus on nuclear energy as safer and cleaner source of energy can give a lifeline to cash starved Russian nuclear industry. For quite some time Russian nuclear industry is suffering from lack of demand and market for its products. The unfortunate state of Russian economy, particularly before 9/11 when the terrorist attack on World Trade Centre, USA and the resulting war against terrorism pushed the petroleum prices up many times and thus helped Russia to earn huge profits, compelled Russian foreign policy to pay greater heed to trade and commercial issues. Russian nuclear cooperation with India was therefore being promoted with an eye on grabbing a large share in a growing market for nuclear energy. India has announced its desire to increase its nuclear output to 40000 MW by 2020, a goal that might be impossible to achieve unless India gets foreign assistance in larger reactor design, construction and capital.

The precarious state of Russia's nuclear industry became evident when on April 12, 1999 the Director General of Russian Electric power company that operates 29 nuclear power plants had revealed that his enterprise "lacks money to pay workers, perform maintenance and repairs, inspect crucial pipes and even buy fuels".(Olopally Deepa Strategic Analysis)³² It has since been reiterated that Russia must exploit the potential for nuclear exports to earn money for the revival of its own nuclear industry. It is in this context that Russia views its agreement with Iran, India, Cuba and China. If these deals come through Russian ministry of Atomic Energy, Minatom forecast a fivefold increase in its export business.

Though the present state of Russian economy is stable and sound, Russia's policy towards India's nuclear program is still driven by commercial considerations. The easing of export restrictions which seems to be possible after US-India nuclear deal signed in July 2005³³, will provide Russia a readymade market for its nuclear industry which is still facing lack of demand, thus leave no scope for any innovation. In fact, India's rapid rise in recent years has added the pressure on already dwindling energy supplies. This has opened new markets for nuclear energy not only in India but other parts of the world as well. India's importance lies in its size of population and economy. India can not only buy nuclear fuel and reactors but can also go for joint venture project for further research in the nuclear field.

Clash of hegemonic interests

The beginning of 21st century has witnessed the u-turn in the relationship between India and United States. Their relationship has improved rapidly in recent years. This was quite unthinkable in the cold war era. There are various reasons behind this growing proximity between them. The end of cold war and the increasing power of India and China are among them. This is yet another factor which is pushing Russia closer to India. Some observers believe that this is a well calculated plan on the part of United States to encircle China. After the collapse of Soviet Union the main threat to United States comes from

China. The recent growth of China both economically and militarily and its corresponding rise in assertive diplomacy pose a new challenge for American hegemony.

Though, this argument underscores the reemerging Russia under Vladimir Putin, it can not be denied that India is slated to play a very important role in the ongoing hegemonic clashes which seems to be a possibility after the recent rise of Russia under Vladimir Putin.

Come as it may, America's relationship with India has witnessed complete overhaul in the recent past which undoubtedly put Russian interests in the region at a risk. Though India claims that its relationship with the USA is not at the cost of its relationship with Russia it has definitely rang an alarm bell for Russians. Some scholars explain the Russian desire to cooperate with India in the nuclear field where Americans and Europeans were less interested to cooperate, as a result of Russia's desperate bid to regain its lost ground in the subcontinent. They term it as Russian counter move to checkmate Americans in the region. There is no denying the fact, that with more than a million Indian Diaspora living in USA,³⁴ Russia cannot have the kind of leverages in its relationship with India as Americans have. As the recent development in Indo-US relationship has shown that Indian-Americans are playing very important role in the growth of Indo-US relationship. With lesser number of Indians opting for Russia as a destiny, there is a lesser chance of building any Indian lobby and people to people contact as it is in United States. This is one of the serious bottlenecks of Indo-Russian relationship.

This is also true that US is India's largest trading partner while Russia is nowhere in the field. With merely two-three billion dollar of annual trade between India and Russia there is an urgent need to improve these ties. Both India and Russia are willing to have good relations with Americans. India denies that its relationship with United States is at the cost of any third country. Thus it cannot be said India's cooperation with Russia in nuclear field reduces the role of America in the region in any way. On the contrary, it seems US has to play a very important role in any nuclear cooperation between India and Russia. With the signing of India-USA nuclear deal there is a possibility that both IAEA and NSG will change their rules specifically for India, thus allowing it to import nuclear

material and technology from other countries as well. These rules are biggest impediments in India-Russia nuclear cooperation. Once these rules are changed, Russian nuclear industry will be able to reach Indian market. Here there are apprehensions that American nuclear industry may not like India shopping in markets other than USA and it may put some restrictions on Indo-Russia nuclear ties. But will India be ready for nuke cooperation with USA with preconditions set by Americans is a question that remains to be answered? For the time being India does not want nuclear cooperation with USA with strings attached and on unequal terms.

But the moot questions remain. Is Russia's willingness to cooperate with India in nuclear area is its desperate attempt to salvage its dwindling influence in the wake of the brake up of the Soviet Union and American's war against terrorism? Even if we don't accept this argument there is no doubt that India's closeness to USA is a challenge for Russian diplomacy to hold its ground in the region. Whether Russia's cooperation with India in nuclear arena can offset this tilt is yet to be seen. India's hobnobbing with both the rival claimants simultaneously may help it get closer to both the sides but there is a risk of alienating both unless India treaded the path cautiously.

Strategic dimensions of Indo-Russian nuclear cooperation in Eurasian region

Indo-Russian cooperation is also part of broader Indo-Russian relationship having regional dimensions relating to maintaining the Eurasian and Asian balance of power. While the global "pull and push" factors remaining the same for Indo-Russian relations even after the collapse of Soviet Union, it remains to see how Russia, yet to overcome its domestic crisis, comes out of this jinx. In fact, the international scenario is still in flux for Russia in particular, and it will have to find out solid ground to move ahead in bilateral arena with United States. As the compatibility of Russian economy with USA is not in an unavoidable situation, the situation provides US some what limited economics driven basis to deal with Russia. In fact Russian move to go for nuclear cooperation is also propelled by the consideration of its strategic rivalry with United States. These national and strategic imperatives which are emerging at the regional level are likely to prove most influential in determining the nature and direction of Indo-Russian ties.

The renewed attention of America to South-West Asia since September 11, 2001, has essentially hastened the day of reckoning with Islamic brand of terrorism that several countries in the region have been confronting to varying degrees. At the same time, it is important to keep in mind that the shared terrorism/militancy threat is overlaid by geopolitical competition which may be submerged for the time being but is highly unlikely to disappear.

Unlike the global or bilateral levels regional strategic interests hold much greater clarity for both India and Russia. Territorial integrity itself is at stake for these two states exemplified by the Kashmir and Chechnya conflicts, with an important part of the problem perceived to be rooted in their worrisome neighborhood. Indeed, shortly after the Taliban take over in Afghanistan in 1996 when it became evident that Kabul was harboring terrorists whose target extended around the region, India and Russia sought ways to monitor and control terrorist organizations with ties to Islamic radicalism. As the Taliban's chief regional supporter, Pakistan is viewed as heavily contributing to regional instability and part of the larger problem.

Along with Taliban in Afghanistan Russia and India shared the objective of containing the Taliban's strand of political Islam with the Iranian government which was weary from geopolitical and religious perspectives. However, India seems to have become unconvinced about the ability of the Russians to mount any serious effort against terrorism in the area and instead, had begun looking towards the US as more potent partner.

The Russian-Indian coincidence of interests also extends to the Central Asian area where Pakistan and Turkey are viewed as competitors in Russia's traditional sphere of interest. The geo- economics of Central Asia has predictably brought in the US as well which does not want to cede the fate of the region's wealth to the neighboring powers like Iran and Russia.

While not very active before 9/11, the American policy objectives have been to separate and insulate Central Asia's economic interest from Russia. This has had the exact opposite effect on the Russians who find it all the more reasonable to remain engaged in the region. Meanwhile the Chinese have been increasingly insinuating themselves in to Central Asia lured by the energy supply which they desperately require and are mindful of the need to have a buffer or friendly state on its western borders across Xingiang³⁵, where it is confronting Islamic radicalism and separatism.

In 1996 Russia, China and the three bordering Central Asian states of Kazakhstan, Kyrgyzstan, Tajikistan, formed the Shanghai five, which was later named as Shanghai Cooperation Organisation (SCO), a formal structure aimed at confidence-building measures on the borders and other forms of cooperation. The group has had its share of tensions, especially as the central Asian states relation with China became more bilateral in nature, to the dismay of Russia. The formation of this new group added new dimension in the politics of the region as both Russia and China came at a single platform for the first time after their ill-fated rift during the cold war.

Rise of China and Russian diplomacy

China's involvement in the nuclear proliferation in South Asia is a well known fact. Apart from the development of nuclear weapon program China is also helping Islamabad to build nuclear power plant in Pakistan. One such plant is situated in Chasma, Pakistan. China has been actively involved in Pakistan's nuclear program from the very beginning. India has expressed its concern to this collusion between China and Pakistan time and again. In fact China's involvement in the region is increasing day by day. It is not only helping Pakistan to develop nuclear weapon but also supplying arms and ammunition to Islamabad. China is also building a naval port at Gwader in Pakistan. China's all time friendship with Pakistan is a serious matter of concern for Indian policy makers. Chinese companies are investing heavily in Pakistan. This increasing stake of China in Pakistan will definitely embroil China in the affairs of the sub-continent. India's concern emanates from the fact that Pakistan's nuclear program is mainly India-centric. This military build-

up with the active support of China is also a matter of concern for Russia which has vital strategic and other interests in the region. The changing balance of power in the region is definitely a cause of concern for Russia despite its avowed objective of trilateral cooperation with China.

China's involvement in the region also comes under scanner owing to its expansionist past and its claim over Arunachal Pradesh and other areas of India. Russia had its border problem with China till recently. They have even clashed on the issue of border problem in the past. Secondly, Chinese are also trying to de-throne Russia from leadership position in SCO. In fact, the rivalry between Russia and China in SCO seems intense. Russia succeeded to accord observer status to India in SCO despite Chinese apathy to that. Thus Russia has its own problem with China. Any asymmetry developing in their power equations in South Asia will be detrimental to Russian interest in the region vis-à-vis China. Russia fully understands this.

Indo-Russian nuclear ties are also bringing both the countries closer to each other by making them interdependent and harmonizing their interests. India and Russia reaffirm the importance of their strategic partnership which serves their national interests, strengthens their bilateral relation and contributes to international peace and security and highlights the importance of their mutually beneficial cooperation and shared objectives in the field of nuclear energy.

Chinese role in the cooperation between India and Russia is also important from other point of view. India-China-Russia trilateral cooperation is a project in the pipeline. Both China and Russia seems to be curious about this trilateral cooperation. But India is walking tightrope in view of its cordial relationship with United States. Though this cooperation is not avowedly against USA, one of its objectives is to democratize international relationships and to create a multipolar world. This is indirectly against Americans who are pursuing hegemonic policies with unipolar world view. This trilateral cooperation is a good opportunity for India as it may get Chinese support in nuclear watchdog IAEA or NSG. This may make the task for Indo-US nuclear deal much easier.

Nuclear proliferation in South Asia and Russia

The 1998 nuclear explosion by both India and Pakistan was vehemently criticized by Russia. Russia strongly supports the Non-proliferation regime and it is a moral stand of Russia on which its nuclear policy rests broadly. The opposition to the tests can be understood by the statement of the then Russian President Boris Yeltsin who declared, "India has let us down". (Zafar Imam, 2001)³⁶ When Pakistan exploded its own bomb few days later, the concern heightened in Russia and a threat of nuclear arms race seemed evident according to Russian perception. Russia joined the chorus of other Western countries in criticizing the nuclearization of South Asia and demanded the immediate abandonment of nuclear weapon by both countries. As the bubble subsided, the "realpolitik" took over the emotions and Russia started to look for cooperation with India in line with its old relationships. When Vladimir Putin took over as the President of Russian Federation, Russian foreign policy took a sharp break from the earlier Yeltsin era. Thus Koodankulam Nuclear Power Project which was signed in 1988 but put in cold storage was brought back and Russia took steps for its completion. This had become necessary in view of the NATO's bombing in Yugoslavia and its support to the various "colour revolutions"³⁷ in Central Asian and Eastern European countries for regime change. It was not only the NATO's expansion but the eastward spread of European Union also posed a threat to Russian Security by exposing its Western frontier. These "revolutions" are also symbolic of the increasing influence of United States in the region. Thus Russians were forced to revive their old ties and find new partners in world politics. The changing attitude towards India can be viewed in this perspective. Later when Putin visited India he not only endorsed India's nuclear program but also signed new MOU with India for peaceful nuclear cooperation in energy sector. The execution of earlier agreement to set up nuclear power plant in Koodankulam, Tamilnadu was also speeded up. Though Russia is not in favor of nuclear proliferation in the region, it has increasingly begun to understand India's defense compulsion and its growing need for energy. This is the cause behind Russia's support for India's nuclear program and advocating India's access to nuclear energy. It has also softened its stand towards the non-proliferation cause in the region.

Russian concern about the nuclearization of South Asia was heightened at a time when the illegal supply network of Pakistani scientist Abdul Qadir Khan was unearthed. Russia was deeply concerned about this nuclear smuggling as Russia is in the hit list of terrorist organizations much like India. These terrorist organizations are trying hard to acquire the nuclear weapon to cause widespread devastation and bring the state to submission. Till today there is no sign that these groups have acquired these complex technologies. This network has been instrumental in supplying nuclear technology to North Korea (The Time, November 2006). The October 9, 2006 nuclear test of North Korea was partly the result of this illegal smuggling of nuclear technology. The involvement of this network in Iranian nuclear program is also charged by the West. Though, Russia itself has been instrumental in helping Iranian nuclear program, it has always denied its role in any illegal proliferation and has supported Iran's right of peaceful use of nuclear technology. Russia is building Bushehr nuclear power plant in Iran. As a matter of fact the disclosure of this hidden network has heightened the insecurity of not only India and Russia but of all those states that are fighting the terrorist threat and are concerned about the nuclear weapons falling in the hands of rogue elements.

US-Russia relationship and its repercussions

Indo-Russian nuclear cooperation is also tangentially related to the state of Russia-US relationship. US insistence to non proliferation is well known (Sethi, Manpreet).³⁸ In fact the NSG guidelines were crafted mainly on American initiatives. However, Russian acceptance of US proliferation concerns cannot be taken for granted. In fact, Russia has been skeptical of US fears arising from countries of concern such as Iran, Iraq or North Korea on which the US has premised the need for building a national missile defense. Instead Russia has been more apprehensive of the degradations of its own nuclear deterrent in case the missile shield is put in place in violation of the Anti-ballistic Missile Treaty of 1972.³⁹ In this context, Russian nuclear assistance to India or Iran against the wishes of the US can also be viewed as a sign of assertion of its own nuclear stature and power. Also this cooperation can be used as a bargaining chip on a later date in order to hold the US to commitments under the ABM treaty.

It is also in a similar context that one needs to note the Russian interests in reprocessing of spent fuel for other countries, despite US opposition to the idea. In fact out of a total of \$100million aid to Russia before 2000, for joint research into developing civilian reactors and fuel, for security upgrades of civilian plutonium stockpiles etc, the US made the release of \$75million contingent on Russia halting the reprocessing of spent fuel in 2000. But the threat of aid suspension could not deter Russia from entering the nuclear market.

Today, when Russia seems to be less concerned about any threat of American bullying tactics Moscow is mindful of the international concerns about the non-proliferation and arms control. US-Russia relationship is not having direct impact on Indo-Russian relationship but it is important from a different viewpoint. As both the countries are influential members of NSG and NPT there cooperation in these fora is must for India to achieve any significant gain in nuclear supply. Though Russia's commercial interests, and a desire, to chart its own course of action in international affairs, despite its comparative decline in strength, are the prime determinants of Russian policy decisions. American pressure whether applied through the threats of holding back economic assistance, or in the name of non-proliferation concerns seems to be less likely to influence Russian decisions.

In fact, US-Russia relationship has a strong bearing on India's nuclear program. As we have seen that most of the time in the past US has been opposing to Russian help to India in the nuclear arena. It's not only the non-proliferation concern of USA which plays its role but USA is apprehensive about the overall growth of Indo-Russian relationship. USA still views Russia as a competitor in South Asia. Any close cooperation between Russia and India in nuclear area is sure to raise US concern as it may cement their ties in other direction like the much talked about trilateral cooperation between India, China and Russia.

US-Russia relationship is also important in the fora of international non-proliferation regime. India's nuclear program will remain constrained and confined so long as these non-proliferation regimes don't change their rules. This can only be possible if both USA and Russia cooperate with each other. This seems feasible as these regime changes are in the interests of both the countries. If this happens both the countries, USA and Russia, will be able to enter the lucrative Indian nuclear market with their products and in nuclear field.

Threat of nuclear terrorism

The spreading tentacles of the terrorist threats are a new challenge which makes Russia anxious about its own security. Much before the rise of Taliban in Afghanistan terrorist activities were taking place in Russia and other Central Asian states. The rise of Taliban aggravated the whole problem. The Beslan tragedy which took place in 2005 exposed the heinous side of terrorism. In Beslan more than 300 children were killed by terrorists claiming to fight for the independence of Chechnya. This incident only strengthened the resolve of Russia to fight this menace. Since Russia itself was facing this challenge and has been a victim of this menace it supported American war against terrorism. Russian resolve to fight terrorism was strengthened as a result of Beslan tragedy. Russia's concern also heightened due to its vast Muslim population. Any spread of fundamentalist Islam in the region, has the potential to endanger Russia's own security.

Indo-Russian nuclear cooperation has great relevance for checking the spread of nuclear weapon in the region and especially it's falling in the hands of terrorist organizations and the so-called rogue states. It is a proven fact that many terrorist organizations like Al-Qaida are trying to acquire nuclear weapon through illegal means. India and Russia as responsible nuclear powers have the responsibility to check any such activity which has the potential to spell doom for the world community. Today the whole international community is fighting this threat in one form or another. The worldwide linkages of the terrorist organizations like Al-Qaida have made it necessary for the states to pool their resources and fight the menace collectively. This threat is closely linked to the rise of Islamic fundamentalism in the world recently. This is also linked to the problems of

insurgency in the areas like Kashmir or Chechnya. The proximity of Russia's threat-prone areas to Indian subcontinent and their virtual linkages with each other is a challenge which makes the cooperation between both the countries necessary. Russia's cooperation with India in nuclear field may not have any significance from this point of view but it definitely brings both the countries closer to cooperate in other areas of mutual interests.

Indo-Russian nuclear cooperation is also aimed to deter the terrorist organizations from acquiring nuclear weapon through illegal means. India and Russia resolve to check any illegal transfer of nuclear technology which may fall in the hands of terrorist groups. This is also an effort to stop terrorist groups operating in the region from acquiring nuclear weapons. The existing instability in Afghanistan and Pakistan is a cause of concern for both the countries. The illegal nuclear smuggling taking place from Pakistan through Qadir Khan network has inadvertently shown the threat which can wreak havoc not only for Russia and India but for the whole world.

The issue of terrorism is linked to Indo-Russian cooperation in the sense that both the countries have the responsibility of putting a check on nuclear smuggling which might fall in the hands of terrorist organization having worldwide linkages. Indo-Russian nuclear cooperation can also deter these groups from acquiring these lethal technologies. This has become more important in the wake of Qadir Khan Network coming into light.

It's not only the terrorist organizations who are trying to get nuclear weapons through illegal means but many neo-aspirant states are also striving hard to acquire this technology either by smuggling or being supplied by some rogue states. This issue came to limelight after the role of Qadir Khan Network was unearthed in North Korea's nuclear programme. In 2001 US president Bush suggested a Proliferation Security Initiative (PSI)⁴⁰ to interdict and deter any illegal smuggling of nuclear smuggling on high sea. The proposal has been signed by many countries and the cooperation among the navies of member countries has become possible. Thus the threat of nuclear black-marketing and nuclear terrorism has become evident and this poses a challenge for India and Russia to deal with.

The above discussions highlight the Russian concern in South Asia and its changing parameters in the region. As a matter of fact Russian policy towards the nuclearization of South Asia in general and India in particular is guided more by hard pragmatism and realpolitik than any ideological or emotional concerns. The rapidly changing power equations in the world have made almost all the countries change their priorities in South Asia. India's economic prowess is increasing rapidly, forcing different players in the region to overhaul their strategy and Russia is not an exception to that. Nuclear energy which was almost the prerogative of P-5 countries has become the energy of the future in the wake of the dwindling supply of fossil fuels. India's indigenous research program in nuclear area needs to be supported by technology import from other developed countries. This has been more or less recognized by the international community though much depends on the passing of the Indo-US nuclear deal by US congress and corresponding changes in NSG guidelines. These changes will remove the last vestiges of nuclear apartheid and open the floodgates for India's nuclear research program. The international suppliers of nuclear technology, particularly Russia and France, are waiting with crossed fingers for India to enter into additional protocol with IAEA and NSG, making specific exemption clauses for it. Russia is more eager in view of its old ties with India. As the international nuclear market opens for India, it will boost India's research program. Since Russia has very advanced technology it will be easier for Russian nuclear companies to make their presence felt even in competition with the other nuclear suppliers. It will give India options to choose its requirements from a number of alternatives. The rapid economic growth of India in the recent years in South Asia has increased the purchasing power of India. The opening of Indian economy has resulted in the spiraling growth pattern which has increased the purchasing power of the people as a whole. The vast market of this billion plus population presents an irresistible attraction for Russian industries. Thus, Russia has revamped its position to suit the new emerging reality in the region.

Chapter Three

RUSSIA'S NUCLEAR POLICY VIS-À-VIS INDIA'S NUCLEAR PROGRAMME

International relations are always driven by national interests. States are always concerned of their own interests. The so-called cooperation is the bargaining chip for states to further their own interests. As per the realist theory, states change their strategy according to the emerging geo-political dynamism in international politics.⁴¹(Andrew Heywood) Right from the beginning of the nuclear age and Russia's testing of atomic weapons in 1949, Moscow's nuclear policy has been continuously changing as per the requirement of changing world politics and Russia's own geo-strategic interests. In the initial years the main focus of Russian nuclear programme was to counter American challenge and thus securing its own security and national interests. This was the period when the main focus of Russian nuclear programme was military in nature and the civilian use of nuclear energy was not clearly identified as an alternative to the growing energy demand of the world. In the initial phase, Russia was not very curious to enter into any meaningful cooperation with other countries in nuclear field. Though India enjoyed good relationship with USSR after the demise of Soviet leader Stalin, it could not get concrete nuclear technology from USSR. It was only after India started its own nuclear programme independently with first reactor being set up in Tarapur with US supplied reactor (CIRUS) that USSR started to change its policy towards India.

Russia's nuclear policy from its very beginning has been dualistic in nature. During the cold war when the arms race was a predominant concern for the Soviet policy makers USSR undertook hundred's of nuclear tests. Those tests were justified on the name of national security and the existing strategic concerns in the wake of the Western challenge. But unlike Americans, Soviet Union was very concerned about the proliferation issue. That was the reason why Soviet Union did not support the nuclear programme of its own allies like China. Though, China's nuclear test is often attributed to Soviet help but the matter is never conclusively proved. It is another thing that Soviet Union set up its nuclear arsenals in the Eastern European countries as well as the Central Asian Republics which was often considered as its own backyard. Even the peaceful use of nuclear technology was not advocated openly. Perhaps that was the reason that Indo-Russian or Indo-Soviet nuclear cooperation was not even on the agenda of their mutual ties. Though, some sort of cooperation was envisioned, it could not fructify to a considerable extent. The dual nature of nuclear technology as its connection to the arms sector and peaceful use discouraged Soviet Union to considerably extend the scope of the cooperation.

Russia's nuclear policy and military doctrine

Soviet Union's nuclear policy was very much the result of cold war considerations. Soviet Union always used nuclear threat as a weapon to counter American challenge. It's supremacy over United States in the field of nuclear and missile technology was necessary in view of its weak strategic base and alliance superiority of United States. Soviet Union was always concerned about the stronger US position in Europe and its worldwide allies due to American money power which could not be matched by Soviet Union. Thus, Soviet Union never committed 'no-first use of nuclear weapon' doctrine against those countries that were the allies of USA, and kept its option open to face any eventualities. Soviet Union remained critical to any nuclear weapon in the world. Thus the nuclear tests by United Kingdom and France were criticized as anti-Soviet and dangerous for world security. This remained the cardinal principle of Soviet nuclear doctrine till the very end of Soviet Union.

The Russian Federation's military doctrine was announced on 2nd November 1993 and approved by president Yeltsin and the Security Council when the parliament was not in session and thus adopted without any discussion in the parliament. This method was not dissimilar to the Soviet period when the CPSU⁴² elite without any discussion in representative bodies or public participation, decided important issues.

Russian nuclear policy has been changing in view of the changing political scenario of the world. The end of the cold war rivalry between Russia and the West brought corresponding changes in Russian policy. In fact the end of the cold war also signified important changes in the capability of Russia itself. No doubt the stockpiling of nuclear weapons in the world was a continuous threat for whole world. The concept of nuclear deterrence as a political instrument continued to form the basis of the nuclear policy of Russia even after 1991. "The goal of the Russian federation's policy in the area of nuclear weapons is to eliminate the danger of nuclear war by deterring the unleashing of aggression against the Russian federation and its allies."(Military Doctrine, and Russia's Security Panel, 1994 quoted in "*The making of New Russia*" by Anuradha Chinoy

2001).⁴³ Proliferation from threshold countries was cited as a new threat. Russia's commitment to the Non-Proliferation Treaty was reiterated. The Russians were thus critical of the nuclear tests carried out by India and Pakistan in May 1998. (Chinoy, Anuradha, 2001)⁴⁴

The Russian nuclear doctrine committed itself to no use of its nuclear weapons on non-nuclear states and emphasized that "it would strive to reduce nuclear forces to a minimum level that would guarantee the prevention of a large scale war, maintain strategic stability and eventually lead to the complete elimination of the nuclear weapons." The concept of no first use in the nuclear policy that was present in the Soviet doctrine had been retained. The doctrine pledged not to use nuclear weapons, but does not make this commitment to any state that might be aligned to a nuclear power. This could have alluded to those countries that were to align with NATO⁴⁵.

Russia's nuclear policy differed from the Soviet doctrine that had perceived the US as a direct nuclear and strategic threat and was committed to the protection of the entire Soviet block. But the concept of nuclear deterrence formed continuity between the Soviet and Russian military doctrines, the threat perception has changed. The nuclear policy was coordinated with the military doctrine of the Russian federation.

India's rapidly growing economy and its energy requirements

One question which is generally asked is that why India is so keen for the development of nuclear energy. Nuclear energy comprises only 3 percent of India's total energy consumption. Would not it be more useful to invest the same vast amount of money for the development of alternative sources of energy like wind, waves or bio-energy? Despite the tough nuclear regime and the delicate nature of the nuclear technology why India consider nuclear energy as the solution of it's rapidly growing need of energy resources?

It is well known that India is one of the fastest growing economies of the world. In fact the recent data shows that Indian economy grew at the rate of 9.4 percent in the last quarter of 2006-2007. This is the second fastest growth of any economy in the world after China. The rapid growth of economy has led to proportional growth in the consumption

of the energy. Since India's own source of energy is meager, it has to import the bulk of its energy needs. India's main source of Petroleum import has been the Middle East and North African countries. India imports more than 70 percent of its energy requirements. India's oil pool deficit has always been large though in recent times it has reached to an alarming proportion due to the skyrocketing fuel prices. More than 30 percent of India's export earnings is spent on the import of petroleum in the country. As the rate of economic growth is increasing, the fuel consumption is also increasing proportionately. According to a rough estimate, India's oil import is scheduled to grow up to 90 percent of our total fuel consumption by 2020. This highlights the need for the newer sources of energy. The nuclear energy can go a long way in the direction of meeting this need of India.

One very important reason for India's quest for nuclear energy is India's vast thorium reserve. As per the information India's nuclear programme is designed in three stages. The first stage is based on the use of Uranium 233. The second stage will be plutonium based while the third stage will be based on thorium. India has world's largest reserve of thorium. The thorium reserve of India is mainly found on the Kerala coast. Once the thorium based fast-breeder reactor is brought into operation, India will get a vast source of energy. But for this stage to achieve India needs to consolidate its first and second stage. India needs to get better and much more advanced technology. This requires nuclear trade and cooperation with advanced countries.

The growing environmental concern in the world is another factor. Today increasing temperature of the earth due to green house gases has been a matter of concern for the whole world. The recently concluded summit of G-8⁴⁶ had climate change as its main theme. The generation of green house gases has been attributed to the fossil fuel burning and its growing consumption. These and other man-made causes have resulted in the growth of pollution raising the concern of the international community in recent times. The production of these gases has not only caused the health hazards for the fauna and flora but it has even threatened the very survival of the civilization. The changing weather patterns all over the globe have exposed many region of the earth to the severe

climatic conditions. The glaciers of the Arctic and Antarctic are in danger. They are melting very fast. The increasing frequency of the cyclones and other calamities like the Ozone layer depletion are all the direct or indirect result of this growing threat. Many NGOs all over the world are bringing the issue of climate change to the notices of the state governments. These pressures have resulted in various international conferences and accords like Stockholm Conferences(1972), Montreal Protocol(1987), Rio Summit(1992), Quito Protocol(1997) etc. The Quito Protocol which was signed in 1997 and came into force in February 2006 aims to bring the level of green house gases to 5.2 percent of the 1991 level. The formation of the UNFCCC⁴⁷ (United Nations Framework Convention on Climate Change) was a landmark in this direction. The result of all these efforts has been the growing awareness about the danger caused by the fossil fuel burning. As India's energy consumption is also increasing very fast the search for clean and less hazardous fuel sources was a must, and nuclear energy came handy in this situation.

The cost issue is also prompting India to go for nuclear energy. Right from 1973 when the OPEC countries⁴⁸ raised the price of oil many times the price has been a constant concern for developing countries like India. India's dependence of the Middle East for its oil imports has always an adverse impact on Indian Economy in any price rise situation. The recent West Asia crisis and US attack on Iraq also caused a spurt in the oil price. The alarming rise of oil prices did completely upset the trade balance of many developing countries including India. According to an estimate, every one dollar rise of oil prices slows the GDP growth rate by 0.5% in developing countries. The current price of oil hovers around 60 to 70 dollar per barrel which is negatively affecting the growth of Indian economy. On the other hand, nuclear energy is one of the cheapest sources of energy. That is the reason why many countries including those that have enough reserve of fossil fuel are stressing on nuclear energy.

The last issue is the dwindling supply of oil resources in the world. As the Gulf Region and the Caspian Sea that are the main suppliers of the petroleum today, are drying up very fast, it is assumed that after 2050 we will not have enough fossil fuel to fulfill our needs. The mankind will have to switch to other forms of energy resources. This fact

coupled with the growing scramble for the existing resources in the wake of sky rocketing demand is a major concern today. Today the main demands come from newly emerging economies like China and India. These countries have become very important consumers of energy due to their fast growing economies. This has led to intense competition amongst those energy consumer countries especially India and china. The competition has not only increased the prices but also tension in bilateral relations. Many hostile bidding has been seen between Indian and Chinese companies in recent months. Since China has much larger resources and Chinese companies are more aggressively pursuing the overseas acquisition, Indian companies lost out in almost all cases. India, thus has no option but to diversify its existing supplies of energy.

India's nuclear Programme and Russian approach

India's nuclear programme is not fully open and it is often shrouded in mystery. The lack of information is the main problem faced by any researcher about the Indian nuclear programme. The available information shows that India's nuclear programme is an integrated programme. This means that the civilian and military programme runs side by side and they are dependent upon each other. In fact, the defense research Programme is an offshoot of civilian nuclear research programme. The role of BARC in India's nuclear test conducted in 1998 came under scanner when the western media gave the news of its complicity in India's nuclear testing. The raw material for atomic bomb making is supplied by civilian research programme. As for atomic energy programme, the Department of Atomic Energy (DAE) established on 3rd August 1954, has been engaged in the development of nuclear power technology, appliances of radiation technologies in the field of agriculture, medicine, industry and basic research. An integrated group of organizations, the department comprises five research centers, three industrial organizations, five public sector undertakings and three service organizations. It has two boards for promoting and funding extra mural research in nuclear and allied fields.

The DAE has been pursuing the following 3-stage nuclear power programme-

1. The first stage comprises setting up of Pressurized Heavy Water Reactor (PHWR) and associated fuel cycle facilities. PHWRs use natural uranium as fuel and heavy water as moderator and coolant.
2. The second stage envisages setting up of Fast Breeder Reactors (FBR) backed by reprocessing plants and plutonium based fuel fabrication plants. Plutonium is produced by irradiation of uranium 238.
3. The third stage will be based on the thorium uranium-233 cycle. Uranium 233 is obtained by irradiation of thorium.

India's nuclear programme has two basic goals. On the one hand, it is aimed to create a nuclear deterrence in south Asian region in view of the nuclear status of two of its neighbors Pakistan and China; on the other hand, it is also directed to gain energy independence for India's growing economy. To create a nuclear deterrence has become necessary for India's security. India has faced four wars with Pakistan in last 50 years. It has also faced war with China in 1962 on the issue of border dispute. The war with Pakistan was the result of long standing misperception about each other and Pakistan harbouring the claim of Kashmir. Pakistan's proxy war with India in Kashmir by sending terrorists and the cross boarder support to those groups fighting Indian army in Kashmir has been a perennial source of tension between both the countries. Even today these issues have not been solved. Both the countries Pakistan and China are not on friendly terms with India. Time and again, the disputes arise leading to deterioration in their mutual relations. Thus, India's nuclear programme was focused partly on creating the strategic balance of power in the region and partly gaining energy independence for the country. The collusion between China and Pakistan, and China's growing military power has been a constant threat for India's security. Indian security analyst can not ignore this dynamics of power equations in South Asian region.

The second issue which is more important from India's point of view is energy security. Energy has been the lubricant of any economy. No economy can run without the proper supply of energy as the nature of economy changing, manufacturing and service sectors

are becoming more and more important. The primacy of manufacturing and service sector has increased the demand of oil supply in economy. This has created short falls of energy supply due to India's scarce energy resources. Thus, nuclear energy seems to be a right choice for replacing the existing supply of fossil fuels.

Russia's approach towards India's nuclear programme has been decided by its own requirements in foreign policy. In fact Russia's nuclear policy from its very beginning has been dualistic in nature. When the cold war was on, achieving strategic parity with United States was a predominant concern for the Soviet policy makers. USSR itself conducted hundreds of nuclear tests. Those tests were justified on the pretext of national security and the strategic concerns in the wake of the western challenge. But, unlike Americans, Soviet Union was very concerned about the proliferation issue. Though, it setup its nuclear arsenal in the eastern European countries as well as in Central Asian republics, USSR did not favour the proliferation of nuclear weapons outside its own backyards. Even the peaceful use of nuclear technology was not advocated openly. Perhaps that was the reason that Indo-Russian or Indo-Soviet nuclear cooperation could not fructified to a considerable extent. The connection between the nuclear technology and arms technology discouraged Soviet Union to considerably extend the scope of that cooperation.

The inhibitions in the field of nuclear cooperation with India was further strengthened when India tested its first nuclear bomb on May 18, 1974. The international community especially P-5 (permanent members of the security council namely USA, USSR, UK, China and France) set up an organization called nuclear suppliers Group (NSG) to stop any further proliferation of nuclear technology. NSG consists of 45 nuclear supplier countries and seeks to control export of nuclear materials, equipment and technology both dual use and that especially needed for nuclear weapons development. In 1978 it issued a set of guidelines for nuclear transfers that then did not entail the application of Full Scope Safeguards (FSS) for nuclear exports to non-nuclear weapon states. This provision was incorporated into the guidelines only in 1992 after the discovery of the clandestine nuclear programme being pursued by Iraq.

NPT⁴⁹ is other constraint in Russian nuclear policy vis-à-vis India. The result of the formation of NPT was not at all desirable for Indian nuclear programme. The treaty divided the state into two categories: Nuclear Weapon States and Non-Nuclear Weapon States. While the transfer of technology and other cooperation were allowed for nuclear weapon states, non -nuclear weapon states were debarred from such facilities. Since, India was defined as a non- nuclear weapon state, Russian nuclear export was constrained by its membership of the nuclear suppliers group (NSG).

With Russia being a founder member of the NSG it is this clause that stands in the way of Indo-Russian nuclear cooperation since India does not accept International Atomic Energy Agency Safeguards (IAEA) over its indigenously developed nuclear facilities. Actually, these responsibilities emanate from Russia being a member of NSG and IAEA. Any meaningful cooperation depends on the broader policies taken by both these organizations.

The disintegration of the Soviet Union changed the world politics radically. There was a fear in the west of the loosening state control and thus smuggling of nuclear bomb and sensitive technology from Russia in Central Asian region and other parts of the world. Though, nothing of this sort happened on a large scale, the chaos of the time did not augur well for Indo-Russian relationship. The indecisive and vacillating approach of Russian president Boris Yeltsin and his pro-atlanticism relegated India to the background of Russian foreign policy.

The arrival of Vladimir Putin⁵⁰ on Russian political scene augured well for Indo-Russian nuclear cooperation. Putin's visit to India in October, 2000 was acclaimed due to agreements signed between both the countries on defense and nuclear cooperation. Though, the ground situation remained the same, the more assertive and more vigorous steps were taken by Russia regarding the setting up of two 1000 MW Koodankulam nuclear power plant. This was a welcome step on the part of Russian policy makers given the volatile nature of there relationship with the West and the strict norms established by various nuclear proliferation regime.

Nuclear cooperation is not without costs for Russia, and Russian policy has not been entirely predictable vis-à-vis India. While, Russia supports India's peaceful nuclear research programme it does not support India's weapons programme, and time and again expressed reservation about that. In fact, Russia has been concerned about the proliferation of nuclear weapons in South Asia and other parts of the world. As more and more countries are trying to get nuclear technology, it has been a policy of Russia to oppose any further proliferation of nuclear weapon in the world. Any support to India's nuclear weapon programme by Moscow will weaken Russia's advocacy for the complete annihilation of nuclear bomb from the earth.

How can Russia help India's nuclear programme?

Now, the moot question is that, in view of this existing scenario when the utility for nuclear energy is proven beyond doubt for a developing country like India, which kind of cooperation can be possible between India and Russia. Russia's willingness to cooperate with India is evident from very beginning when Russian president Vladimir Putin visited India in October 2000. He visited India's premier nuclear research centre Bhabha Atomic Research Centre (BARC), which exemplifies Russia's evolving position on military technical cooperation with India. He was the first Russian leader to tour BARC joining only two other foreign leaders before, Chinese Prime Minister Zhou-En-Lai and British Prime Minister Margaret Thatcher. Putin's high powered 70 member delegation which included deputy prime minister Ilya Klebanov, foreign minister Igor Ivanov and defense minister Igor Sergeyev attests to the importance that Russia gives India in this new phase of their defense-industrial cooperation. Again when Putin visited India in January, 2007 as chief guest of India's republic day celebration which was his fourth and perhaps last visit to India as the president of Russian federation, he was accompanied by Russia's nuclear energy minister Sergei Kyrinko. Both the countries signed many accords including one on peaceful use of nuclear energy during the visit.

Indian policy makers have always sought to portray Indo-Russian cooperation in the nuclear realm as far reaching and part of an Indian plan to give significant impetus to its own nuclear programme. India's target as outlined in the latest energy policy is to generate 40000 MW electricity from its nuclear power plants by 2020. This was only twenty thousand MW in earlier policy guidelines. Although, India has a self-reliant nuclear power programme based on indigenized Pressurized Heavy Water Reactor (PHWR), the objective is to develop Fast Breeder Reactors (FBR) and ultimately thorium utilization in a closed nuclear fuel cycle as well as modern Light Water Reactors (LWR).

It is in this context that Russia's role in India's nuclear programme becomes critical. Russia possesses very advanced nuclear technology which India can get access to, if Russia cooperates with India in the nuclear field. This technology access has immense potential in the field of India's energy security. This can enhance India's capacity to generate more energy per unit of fuel consumption and better risk management of any possible nuclear hazards.

Russia has a number of advantages in the nuclear technology which can boost India's nuclear energy programme. In fact, Indian nuclear programme has been constrained by the weak base of nuclear technology and raw materials. Russia can help India's nuclear programme in the following ways-

Nuclear Fuel Supply

This is perhaps the most important area where Russia can help India tremendously. Russia's announcement in March 2006 that it will supply a consignment of Low Enriched Uranium (LEU) fuel for the first two units of the Tarapore Atomic Power Station (TAPS) in Maharashtra must have cheered up the Department of Atomic Energy (DAE) in India. The two United States built Light Water Reactors (LWRs) of 160 MW capacities each use LEU as fuel and light water as both coolant and moderator.

Under an inter-governmental agreement signed by India and Russia in October 2000, Russia first supplied 50 tonnes of LEU to TAPS-1 and TAPS-2 in 2001. In March, 2006 it announced that it would again deliver LEU to the two reactors. The consignment of 50 tonnes was thus delivered in April, 2006. With that amount of nuclear fuel the reactor could operate with the first consignment itself up to 2008 and the second consignment will easily last for another 4 to 5 years, that is up to 2012 or 2013.

The LEU from Russia will be converted into fuel bundles clad in zircoloy by the nuclear fuel complex, Hyderabad and the bundles will be fed into the reactor.

Shortage of LEU has bedeviled TAPS-1 and 2 from 1980, after the US reneged on its 1963 agreement to supply the fuel for 30 years. The US did so, citing domestic laws after India conducted its Peaceful Nuclear Experiment (PNE) at Pokhran, Rajasthan in 1974.

It was on May 8, 1964 that a contract was signed by India and the US for constructing two LWR of 210 MW, each on the shore of the Arabian Sea at Tarapur in Thane district about 150 KM from Mumbai. General Electric built the two reactors, which became critical in 1969. The Pokhran test in 1974 angered the US which first delayed the shipment of LEU and finally stopped it in 1980. In 1982 France stepped in and agreed to supply LEU from 1983 for the remaining period of the agreement that is up to 1983. The two reactors were de-rated in 1984 to 160 MW each. In 1994-95, China reportedly supplies 30 tonnes of LEU.

Meanwhile, India developed Mixed Oxide (MOX) fuel, which replaced enriched uranium partly. Under the inter-governmental agreement of October 2000, Russia first supplied 50 tonnes of LEU, but was unable to resume supplies because of objections from the 45 member Nuclear Suppliers Group (NSG). The NSG guidelines bar its members (Russia is a member) from supplying nuclear technology or fuel to those countries that have not signed the Nuclear Non- Proliferation Treaty (NPT). India is not a signatory to the NPT.

The US is not amused by Russia's latest decision to supply LEU to India. Russia made the offer on the eve of its Prime Minister Mikhail Fradkov visit to India on March 16 and 17 2006. The spadework for this was done in December, 2005 itself during Man Mohan Singh's visit to Moscow and the two countries waited for the March 2, agreement.

Sergei Novikov, spokesman for the Russian Atomic Energy Agency said in Moscow on March 14, 2006 "we have informed the nuclear suppliers group that we are delivering the fuel to the Tarapur reactor". He said that although the supply violated NSG guidelines, it was motivated by safety considerations. "It is necessary to replace the fuel at Tarapur to avoid serious safety risk resulting from overturning of old fuels." Novikov explained.

The US called the deal 'premature' because India was yet to implement the nuclear separation agreement it signed with the US on March 2, 2006 during US president George. W. Bush's visit to India. The separation agreement was the sequel to the joint statement made by Prime Minister Man Mohan Singh and Bush on July 18, 2005. The state department said although India needed the LEU, such deals should move forward on the basis of the joint initiative, on the basis of steps that India will take that it has not yet taken.

Fradkov defended the offer saying that it "does not contradict international commitment. India took the stand that the Russian offer really has no connection to our nuclear deal with the United States", that there was no violation of the NSG guidelines and that Russia had approached the NSG under the "safety exception clause"⁵¹.

The claim that the Russian offer was made to obviate serious safety risk because the reactor needed fuel and over burning of the old fuel had to be averted seems to be red-herring. Beginning from October 1, 2005, TAPS 1 and 2 went through renovation, modernization and safety up-gradation that lasted four and half months at a cost of rupees 20 crores and both were reconnected to the grid on February 16, 2006. The Atomic Energy regulatory board permitted the two reactors to operate for another five years. They were operating smoothly when the Russian offer came.

Reactors and advanced technology

This is another area where Indo-Russian nuclear cooperation is evident. Russia has one of the most advanced technologies in nuclear field. Earlier, India set up reactors with 220 MW and lesser capacity. Now India is building reactor with 540 MW and 1000 MW capacity. Further, the reactor with higher capacity is planned and India is hopefully looking towards Russia. The cooperation began in 1988 when the agreement for the setting up of two 1000 MW capacity reactors was signed for Koodankulam nuclear power plant in Tamilnadu. There are proposals for setting up nuclear reactor of higher capacity with Russian help. In fact, India is willing to get help from Russia on all the three stages of nuclear research programme namely Pressurized Heavy Water Reactor (Stage1), Fast Breeder Reactor Programme (Stage2), and Thorium based reactors (Stage3). India's curiosity for Russian made reactors is due to several factors. Firstly Russia, unlike US or other Western countries does not impose any pre-conditions for technology transfer. Thus, Russian reactors are available to India without any strings attached. Secondly Russian technology is also the world class. In fact, Russia and France possesses the most developed technology to produce the nuclear energy. Perhaps this is the reason that India's nuclear programme is more Russia-centric. Thirdly, Russia is also ready to go for joint research and development programme with India. This is something other countries are not ready to do. As India does not want to remain dependent on technology import perpetually, it is more interested in developing the indigenous technology with Russian help. Thus, Russia's role as a technology supplier on easier terms makes it more attractive for Indian nuclear programme.

Advocating India's case in NSG

This is another area where Russia can come for India's rescue .After the signing of Indo-US nuclear deal India requires to sign an additional protocol with the IAEA .This will lead to pursuant change in rules by NSG. Since Russia is an influential member of Nuclear Suppliers Group its voice in the 45 member group is important for India to steer clear of the hurdles. Though this cannot be denied that it all depends on US congress passing the laws and changing its own Atomic Energy Act of 1954 to lift the restrictions on the export of nuclear technology to India but Russia as an influential member of NSG can definitely bolster India's case once NSG sits on to decide India-Specific norms change.

NSG first came into being as an informal group of few supplier countries in 1975, prompted by the first Indian peaceful nuclear explosion of 1974. With Russia being a founder member of NSG, it is its rules which bar exports of nuclear materials, equipment and technology to non-nuclear weapon state, which is main hindrance in the Indo-Russian nuclear cooperation. Since India does not accept IAEA safeguards over its indigenously developed nuclear facilities, the challenge hence is how India and Russia can continue their nuclear cooperation in spite of the NSG. For the time being the most plausible way seems to be Russia's lobbying with NSG members along with United States to encourage NSG to make India specific exceptions.

Russia's NPT commitment and Indo-Russian nuclear cooperation

Russia was one of the founder members of NPT. It has certain responsibilities towards NPT and its provisions. NPT debar any supply of nuclear technology from a nuclear weapon state to non-nuclear weapon state. As India's position in NPT is that of non-nuclear weapon state, Delhi can not get any nuclear technology from Russia which is a nuclear state. Further, the IAEA safeguard which is compulsory for a country to accept, is not acceptable to India. India has always advocated the cause of non-discriminatory and universal elimination of nuclear weapons from the earth. Since nuclear weapon programme is closely related to civilian research programme it can not be guaranteed that technology transfer would be exclusively used for energy generation. The increasing concern of proliferation of nuclear weapons has complicated the situation further. Russia's NPT membership is definitely creates a hurdle in any meaningful cooperation between India and Russian nuclear arena. Any dilution on the part of Russia regarding NPT provisions will not only weaken Russia's standing in world politics but also adversely affect Russia's advocacy for complete nuclear disarmament.

Indo-Russian nuclear cooperation has been a victim of this multilateral treaty regulating the nuclear trade and transfer in the world. Since all countries who are the members of NPT are unanimous against nuclear proliferation it becomes tougher for Russia to enter into any bilateral cooperation with India beyond the limits prescribed by NPT. As India's nuclear programme needs technology and fuel which requires higher level of transaction,

it becomes necessary for both the countries to go beyond NPT provisions. India's not so open nuclear programme leave no scope for any inspection either by IAEA or any other external agency. This also creates some hindrances as the world community is highly apprehensive about India's nuclear programme. NPT commitment can not be violated by Russia as it guides Russian nuclear policy from the very beginning.

The growing pressure of environment regime

In recent years environmental issues have arrived at the centre stage of international relations. The increasing consumption of fossil fuels which generates tremendous amount of carbon-dioxide and other gases thus trapping the heat of the earth has increased the temperature of the earth. Increasing temperature has not only affected the flora and fauna of the earth but has also threatened the very survival of mankind. Nuclear energy is one of the least pollutant energy sources. The environmental issues have dominated the multilateral talks of almost all the multilateral forums in recent times. Earlier, it was perceived to be the responsibility of only developed countries which are the main polluter of the environment. For instance, United States produces approximately one-fourth of the total CO₂ production of the world. Other developed countries are also high polluters. But now the scenario is gradually changing. The rapid rise of China and India, and the issue of their growing share in the total green house gases production is raised by many developed countries.

Though, the per capita production of green house gases is still very low in developing countries because of their low GDP and low per capita income their high growth rate in recent years is a future risk which will have to be taken into account. The developed countries that have the primary responsibilities to take proper action for climate change programme are fighting shy throwing all the responsibility on the developing countries. The argument which developing countries are giving is that poverty is the biggest polluter. If the developed countries are not ready to even slow down their growth rate how can developing countries where mass poverty and illiteracy are rampant, stop their growth? The developed country's fear that any reduction programme of green house gases will adversely affect their growth rate, can not be justified as they have the primary responsibility to save the earth from near collapse as they are powerful and strong enough to do that.

The environmental concerns have emerged as a dominant consideration in world politics after US refusal to sign “Quito Protocol”⁵² calling India and China to control their green house gases production. India is ready to accept ‘capacity based differential obligations’ which US refused. India’s argument is that since developed countries are mostly responsible for the climate change so far, they must take responsibility to curb it. The per capita energy consumption of the developing countries is still only the fraction of what is there in developed world. Secondly, developing countries are in the process of development. Any arbitrary imposition of environmental norms will hamper the growth process in those countries.

Despite all efforts, it seems that developing countries will have to accept some sort of environmental obligations. Any effort to curb the emission of green house gases will need the change in the consumption pattern of energy resources by developing countries. Nuclear energy comes handy in such situation as it is least polluting energy sources available to the mankind today.

The purpose of above discussion is to highlight the role of nuclear energy in saving the earth from green house gases. Nuclear reactors produce no carbon-dioxide or the green house gases except some radioactive materials and spent fuel. India’s interest to nuclear energy emanates from this very fact. As India’s responsibility towards the environmental protection is increasing India can not evade its responsibility towards environment.

India’s unique nuclear status

A relevant factor that could be exploited by Russia in order to continue its nuclear cooperation with India, despite its membership of the NSG may be found in India’s unique nuclear status .While the NSG guidelines are very clear on no nuclear transfers to NNWS, a possible loophole may be found in the fact that the guidelines do not define a nuclear or a non nuclear weapon state. India, after Pokhran II now does not technically fall in this category. The NPT does not accept it as a NWS, while the Indian government has declared itself as one. It is in this context that the Director of Minatom has described the position of India and Pakistan as “awkward”. He had proposed to the Russian government to place it in a special category and then since India is not a party to the

NPT, exports to it may be sought without the application of full scope safeguards (FSS). In case, it can be accepted as a NWS, then even under the NSG it does not have to accept FSS anyway.⁵³ (Parthsarathi, Ashoka, 2002).

Another point is worth-noting in this regard. In 1996, the Russian government had submitted a "Note Verbale" to the IAEA providing information on its export policies and practices with respect to nuclear transfers. While even under this, the Russian commitment not to transfer trigger list items or dual use technology to a NNWS without the application of FSS is clearly spelt out, some differences with the revised guidelines are evident. For instance, Para 4 (e) has been added to read, "Suppliers reserve the right to apply additional conditions of supply as a matter of national policy". This could open the possibility of national legislation being enacted in such a way as to subject only individual Russian nuclear contacts to limited safeguards. In any case, the guidelines are implemented only through national mechanisms of legislation and enforcement, leaving scope for differences in interpretations.

Secondly, it is also stipulated in Para 4 (d) that FSS would not be required in case of transfers made to NNWS in exceptional cases. These could be if the transfer is deemed essential for the safe operation of the existing facilities or to contracts drawn prior to April 3, 1992. It is under these two provisions that some amount of cooperation between India and Russia has gotten underway. The Russian decision to build two 1000 MW light water reactor in Koodankulam in Tamilnadu is premised on the ground that it was contracted before that cut off, stipulated in the revised NSG guidelines. Secondly in October 2000, Russia also announced its decision to supply low enriched uranium as fuel for the US built Tarapur nuclear power plant. Moscow has defended its decision on the ground that it comes within Putin's decree allowing shipment of nuclear materials in extra ordinary situations.

Theoretically speaking, the NSG guidelines are quite comprehensive and leave little scope for ambiguity. However, Russian economic interest and the manner in which its relations with the US shape up could have bearing on Indo-Russian nuclear cooperation. Owing to what it experiences, based on these two accounts of it, and if it so feels the need to enhance its nuclear cooperation with India, it could take recourse to the unique Indian nuclear position to circumvent the group guidelines.

CONCLUSION

Recent developments

In the backdrop of Indo-USA nuclear agreement signed in July 2005 some important steps have been taken by Russia in its nuclear cooperation with India. In March 2006, just few days after the visit of US president George. W. Bush, Russia announced its decisions to supply 50 tonnes of low enriched uranium (LEU)⁵⁴ for the Koodankulam nuclear power project (KNPP) as well as to the supply of additional light water reactors. This gesture towards the KNPP complex is a proof that Moscow is eager to romp up its cooperation with India in the nuclear energy field. This eagerness seems to be part of the positive externalities generated by the United States July, 2005 offer of nuclear assistance to India. Exactly a year ago, Russia stepped in with a crucial supply of Low Enriched Uranium (LEU) for Tarapur at a time when the US was haggling over which Indian facilities had to be put on the civilian list as part of the separation plan envisaged by the July, 2005 agreement. As with an earlier shipment of LEU, the January, 2006 Tarapur supply was justified on the ground of plant safety. Similarly, fuel for KNPP is perfectly consistent with the Nuclear Suppliers Group's grandfather clause, which allows members to execute commitments made prior to their joining the 45-nations cartel. But once a deal for additional reactors for Koodankulam is inked, Moscow in effect will be demonstrating it's believe in the irrelevance of the NSG's prohibitions for a country like India.

Russia's willingness to put the envelope even before the Nuclear Suppliers Group has altered its guidelines is highly significant. By creating new facts on the ground Moscow has helped New Delhi ensure the defeat of any attempt by a nuclear supplier to clutter the changed guidelines with extraneous and objectionable conditions.

Having adopted a rather restrictive domestic law on nuclear trade with India, Washington will face pressure from its own atomic industry for similar restrictions to be placed on all potential suppliers. The US congress repeatedly stressed the need for a level playing field. Over the long term, Russia's nuclear sully relationship with India has been characterized by reliability, predictability, and constructive spirit. In 1979, when India did

not produce enough heavy water for its nuclear power reactors and vital western supplies had dried up in the wake of the 1974 Pokhran nuclear explosion, the Soviet Union stepped in with an agreement to supply 250 tonnes of heavy water under IAEA safeguards that included perpetuity as well as pursuit clauses. Within the limitations of its non proliferation policy and NSG guidelines, Russia has repeatedly come to the aid of India's civilian nuclear programme with supply of heavy water, LEU and in the latest round, nuclear reactors. With Russia's firm backing, India can enter the final phase of its negotiations with the US and the IAEA with enhanced confidence.

Putin's India visit (January, 2007) and bilateral nuclear cooperation

Indo-Russian nuclear cooperation got a boost when India and Russia signed a "Memorandum of Intent" to add four more units to the nuclear power plants under construction at Koodankulam in Tamilnadu and built an unspecified number of nuclear power reactors at new sites as well.

The memorandum was one of the nine signed in the presence of the visiting Russian President and Indian Prime Minister Man Mohan Singh who held talks on a wide range of issues as part of their annual summit meeting. During the course of the talks it became clear that Russia gives due importance to its relationship with India and is ready to go ahead with its commitment of nuclear cooperation with India. In fact nuclear cooperation emerged as a matter of great significance on the talks. It became clear that the changing dynamics of world politics especially the prospects of new nuclear market after the signing of Indo-US nuclear deal was a great attraction for Russia and it was ready to derive benefit out of this.

In a joint statement on cooperation in peaceful uses of atomic energy both countries committed themselves to further developing international cooperation to promote the use of nuclear energy. Noting their cooperation in Koodankulam, the statement⁵⁵ said the countries would work together to expand civilian nuclear energy cooperation aimed at enabling India to realize its goals of promoting nuclear power and energy security in a self-sustaining manner. "With the objective to implement these objectives an agreement

between India and the Russian federation will be signed in the cooperation of four additional units at Koodankulam” ,the statement read.(Strategic Digest, February 2007).⁵⁶

Russia like France has positioned itself to enter the Indian nuclear power sector in a big way by signing the memorandum of intent on four additional reactors at Koodankulam and for new sites as well. The expectation that drives both the parties is the prospect that Nuclear Suppliers Group will soon lift restrictions on nuclear commerce with India.

Russia will continue to work with participating governments in NSG in order to create conditions through amendments to its guidelines to facilitate expansion of civilian nuclear energy cooperation with India.

Further, the Department of Atomic Energy and the Russian federal Atomic Energy Agency would work out in 2007 a comprehensive programme of cooperation for the peaceful use of atomic energy, the statement said.

The joint statement between India and Russia reads further-⁵⁷

“India and Russia reaffirm the importance of their strategic partnership which serve their national interest, strengthen bilateral relations and contributes to international peace and security and highlights the importance of mutually beneficial cooperation and shared objectives in the field of nuclear energy.

India and Russia as states possessing advanced nuclear technology recognize that nuclear energy provides a safe, environment-friendly and sustainable source of energy. They underline the need to further develop international cooperation in promoting the use of nuclear energy for peaceful purposes in accordance with their respective international commitments and national legislations. They believe that nuclear energy will provide an indispensable source of energy for future generation.

India and Russia as responsible states share an objective of ensuring non proliferation of weapons of mass destruction and their means of delivery including possible linkages with terrorism.

India and Russia resolve to further emphasize their willingness to expand and strengthen their scientific and other exchanges and bilateral dialogue on peaceful uses of nuclear energy.

India and Russia note with satisfaction their ongoing cooperation in construction of nuclear power plant at Koodankulam, India and Russia reaffirm their commitments to work together to expand civil nuclear energy cooperation with a special emphasis on nuclear power generation aimed at enabling India to realize its goals of promoting nuclear power and achieving energy security in a self sustaining manner.”

With the objective to implement these intensions, an agreement between the government of India and the government of the Russian federation will be signed on cooperation in the construction of four additional units at Koodankulam.

India undertakes that the reactor facilities and the nuclear fuel supplied by Russia remain under the IAEA safeguard during the entire period of their actual use in accordance with the agreement on safeguards which shall be concluded between the republic of India and the IAEA. It will also inter-alia take into account measures relating to physical protection and other issues as may be actually agreed.

“India and Russia recognize the importance of research and development for the development of innovative technologies which reduce the risk of nuclear proliferation to further facilitate the wide scale development of nuclear energy. International project for nuclear reactors and fuel cycles (IMPRO) which is being implemented under the aegis of IAEA with the participation of India and Russia is an example of productive international cooperation.

India and Russia express their willingness to further expand and strengthen their bilateral civilian nuclear energy cooperation by broadcasting cooperation covering both power (fission and fusion) and non power appliances in areas of mutual interest to be identified by both the sides.”⁵⁸(Ibid)

Thus, the joint statement makes it clear that Indo-Russian nuclear cooperation is entering into a new phase with their emphasis on creating a synergy to generate compatibility for a strong relationship. Both the countries realize the importance of nuclear energy and their associated challenges. They are ready to cooperate in the interests of mutual benefit but they are not unaware of the associated risks. That is the reason that they are also concerned about the threat of nuclear smuggling and nuclear terrorism. Since both of them are nuclear power states, they have tremendous responsibility to intercept and check any nuclear proliferation not only from their own soil but also from, other parts of the world. Russia clearly understands India’s energy requirements and the contribution nuclear energy can provide in it. Now, when the US-India nuclear cooperation has been signed the prospect for the further growth of Indo-Russian nuclear cooperation seems to be brighter. Though the route of this deal is still not clear as both the countries have miles to go in their negotiations and tough bargaining is on between them it seems that both the countries are committed to go further with the deal. Come what may, the deal is a landmark event which if negotiated tactfully by India will open new possibilities for Indo-Russian nuclear cooperation.

Indo-US nuclear deal and its likely impact

Recently India and US signed a nuclear deal which is generally considered to be a landmark event in India’s nuclear programme. The deal envisages India’s nuclear programme to be bifurcated making the civilian and military programme separate from each other. The civilian nuclear programme is to be supervised and monitored by IAEA and put under full scope safeguards (FSS).⁵⁹ The military reactors to be demarcated by Indian government and nuclear establishments will be immune from any outside inspection. India will sign additional protocol with IAEA and will prohibit any proliferation of nuclear technology from its soil. India will also adhere to its moratorium

on nuclear explosion. Thus, India will not test nuclear weapon any further. The moratorium will be voluntary and India will remain an influential partner of nuclear community. US also accepts India as a country with advanced nuclear technology which is far short of giving India a nuclear weapon state status. In return, India will get nuclear reactors and fuel from other country. The nuclear market will be open to India and Delhi will be free to acquire sophisticated nuclear technology from its preferred destination.

Thus, the deal will end the regime of nuclear apartheid which is currently ruling the world. The restriction on India requiring high-tech materials in nuclear field is the main constraint in India's nuclear growth. In fact, India's Atomic Energy Commission has stipulated the generation of 40000 MW energy from its nuclear reactors. This target can not be achieved unless India acquires latest technology in the nuclear field. The indigenous nuclear research programme of India has witnessed very slow growth in the past because of its inability to produce more energy per unit of fuel consumption. This is also the result of India's backwardness in cutting edge technology. More important than that, it is India's lack of natural uranium which is the main hindrance in slow growth of nuclear energy sector. As we know India has very few available source of natural uranium. Till now it is only the Jaduguda mines situated in Singhbhum district of Jharkhand which is the main supplier of uranium in the country. Secondly India's available uranium is of low quality which produces less energy per unit of uranium consumption. The nuclear deal with US will definitely help India to overcome these difficulties. The opening up of vast uranium market and technology sources will help India to strengthen its nuclear energy programme. The deal also stipulates India to create a buffer stock of nuclear fuel for any future eventualities. Though, there are still many hiccups in the way of the Indo-US nuclear deal, it seems that both the countries are serious about the prospects of the deal and wants to fulfill it as soon as possible.

The relevance of Indo-US nuclear deal for India's cooperation with any other country in the nuclear field depends upon the parameters set by the Indo-US deal itself. Since the deal is aimed to change India's standing in various nuclear regimes, it is expected that either NPT or NSG will change their guidelines for India to allow it to get nuclear

materials equipment and technology from outside. Since Russia has the most advance technology in the nuclear field India can buy reactors of 1000 MW or higher capacity⁶⁰. Russia's cooperation with India will be eased from the shackles of various nuclear regimes due to the signing of Indo-US nuclear deal. Since, Russia is already a partner of India's nuclear programme, US support and help will boost their mutual cooperation. The support of only super power of the world will help India to bargain and reach an agreement with NSG or IAEA.

Iran issue and Indo-Russian nuclear cooperation

Indo-Russian nuclear cooperation has been badly affected by the whole controversy of Iran-USA nuclear tussle. Iran's open defiance of Non-Proliferation Treaty and its covert nuclear weapon programme has been a matter of concern for international community. India does not want a nuclear Iran which was made clear by Indian prime minister during his speech in Lok Sabha. The ramifications of Iran issue on Indo-Russian nuclear cooperation, derives from the fact that Russia is directly involved in Iran's nuclear activity. In fact, Russia is building Bushehr nuclear power plant in Iran. Russia has supplied reactor and other vital equipment to Iran for its Bushehr power plant. Thus Russia has vital stake in Iranian nuclear programme. Russia along with China has been opposing American efforts to impose sanctions against Iran.

The Iran issue has vilified the Russian's move to help India's nuclear programme. In fact Russia is using Iran as a counterweight to US influence in the region. Russia's banking on Iran has counter fired in recent times and the international community has started looking skeptically towards Russia. Russians effort to help Iran in the name of energy security has not gone well with USA or European countries. Iran has enough energy resources and it is one of the main petroleum exporting counties of the world. Thus, Iran's claim for energy security seems to be hollow. Now, it is more than clear that Iran has an open nuclear weapon programme. Though Russia's complicity in Iranian weapon programme is not established, Moscow's help to Iran in building Bushehr power plant is well known ,though Iran always claims its nuclear programme to be peaceful and in compliance with the NPT.

The dilemma before the international community is not how to deal with Iran but how to persuade Russia and China to toe their lines and cooperate with international community in dealing with Iran. The whole Iranian nuclear drama has heightened the concern of the West on the issue of non proliferation. Russia's participation has made the world apprehensive towards Russia's cooperation with other countries as well. Thus, even if India is not directly linked to US-Iran controversy, it has become tougher for India to get any nuclear supply from outside, including Russia.

The Iran issue has diverted the attention of international community from nuclear energy to nuclear weapon. Though India's case is genuine as India is one of the most energy-starved countries and its economy is asking more and more energy sources the nuclear suppliers group has become more cautious about any nuclear supply to a non nuclear weapon state. After the signing of Indo-US nuclear deal, it seemed that most of the countries are reconsidering the nuclear policies vis-à-vis India. It is yet to see any perceptible change in the policy of those countries and corresponding changes in the guidelines of international nuclear regimes.

Constraints of Indo-Russian nuclear cooperation

Indo-Russian nuclear cooperation has several roadblocks. The nature of the cooperation itself is challenging. From its very inception India's nuclear programme has faced several hurdles from developed countries. The complete monopoly of the western countries and India's developing stage of economy has always slowed the pace of India's nuclear programme. As the need for nuclear energy became evident, Indian policy makers were forced to look for alternative options to serve its nuclear interest. In today's context following constraints seem to be the stumbling block in India's nuclear cooperation with Russia.

International nuclear regimes

This is the most important obstacle in the way of Indo-Russian nuclear cooperation. The current production of nuclear energy is limited and the Indian nuclear programme has come under criticism in terms of cost efficiency and safety. So far, however the nuclear

power establishment has warded off such criticism, in part pointing out the need for reducing the country's energy dependency, a view shared by successive Indian leadership. Various international regimes mainly NPT and NSG have been main hurdles in the way of Indo-Russian nuclear cooperation. NPT which was formed much before India tested its first nuclear weapon excludes India from its ambit of nuclear weapon state. As per the guidelines no scope is left for any country to get nuclear status after the stipulated 1968 time period. India has been left as a non-nuclear state despite its de facto nuclear status. The non-nuclear status bars any outside help for India's nuclear programme.

Similarly, NSG guidelines have also become obstacles in Indo-Russian nuclear cooperation. Nuclear Suppliers Group debar its members from supplying any nuclear material to those countries which have not signed the NPT and whose nuclear programme is not open to the supervision of IAEA. Since India does not allow its nuclear research programme to be supervised by IAEA or any other international agency, it has virtually been banned for India to export any nuclear materials or technology from outside.

Sanctions and restrictions

This is another constraint for Indo-Russian nuclear cooperation. Time and again the developed countries have imposed bans on India's nuclear programme. When India conducted its first nuclear test in 1974, various countries imposed ban on New Delhi and stopped any supply of technology transfer to India. India was not only declined to get nuclear technology but all dual use technology which might have potential to be used in nuclear programme directly or indirectly. Canada, which was the main supplier of nuclear fuel stopped the supply of fuel and also all other cooperation with India. This resulted in the disruption of India's nuclear programme.

Similarly in 1998 when India undertook peaceful nuclear explosion almost all developed countries including USA, Australia, Japan, New Zealand, France, Germany imposed restrictions on India. A number of India's top scientific institutions were blacklisted in

United States and other countries. These scientific institutions were debarred from any kind of help and support. Not only this, even the academicians and faculties were denied visas to visit scientific institutions abroad. Thus, various sanctions and restrictions imposed on India left India with no choice but to rely on indigenous support base.

The exigencies of working under external sanctions, imposed on India in light of its nuclear activity, have also allowed the nuclear energy programme to enjoy a more exalted position than it might otherwise have had.

It is precisely in the context of sanctions and other international regimes that Russia's role in the nuclear field becomes critical for India. India has been looking towards other suppliers such as France, but without any immediate result. As a leading Indian strategic analyst commented, 'the reality is that Russia today is the only great power which is ready to cooperate with India in the Atomic Energy sector.' But the sanctions and bans left no option for Russia to go beyond the limits demarcated by the various international agencies.

Russia's dilly-dallying policy

Russia's ad-hoc approach has been another reason for the slower growth of Indo-Russian nuclear cooperation. Nuclear cooperation is not without costs for Russia, and Russian policy has not been entirely predictable vis-à-vis India. Before 1991 Russia's cooperation with India was guided by its cold war consideration. After the disintegration of Soviet Union, Moscow's policy continued to vacillate and no firm policy was taken by Russian policy makers. In fact, Russia remained in dilemma for quite some time. Its short term honeymoon with United States and its desire to get help from USA in its reform effort did not materialize. This failure forced Russia to go for its course correction in international politics and regain its lost ground.

So far, Russia has been able to circumvent some of the most restrictive clauses of key relevant regimes of which Russia is a member because of loopholes and creative interpretation. At the moment India does not appear to have much choice but to bank on Russia's stated and implied intentions. A critical testimony to the desire of Russians to deepen future relations is the Memorandum of Understanding on Peaceful Use of Nuclear Energy signed along with the Declaration on Strategic Partnership during Putin's visit to India.

Russia has been careful about not appearing to deviate from the most important nuclear export control mechanism, the Nuclear Suppliers Group and its guidelines. Russia itself has enacted national export control legislation, most notably the Federal Law on export controls adopted in June 1999 by the Russian parliament and signed by the President. There is also an Export Control Commission which has an impressive high level roster of representatives: the Federal Security Service, Ministry Of Foreign Affairs, Ministry of Economy Ministry of Defense, Ministry of Industry and Trade, the States Customs Committee etc. the commission determines whether contracts and agreements and some licenses comply with Russia's international commitments.

Fear of proliferation

This is another constraint which hampers the progress of Indo-Russian nuclear cooperation. Today the fear of proliferation has become more glaring in view of the recent nuclear tests by North Korea. North Korea is termed as a rogue state⁶¹ by United State. Nuclear weapon falling in the hands of rogue state poses a great threat for the whole world. When North Korea tested its nuclear weapon on 9th October 2006, the proliferation concern started to haunt back the international community. This test also made India-USA nuclear agreement tough to pass in the US congress and the concern of US congressmen increased. This was the reason that the deal faced vehement opposition in US congress and now stands on the verge of collapse.

This is an undeniable fact that India's record of non-proliferation has been fantastic. Despite Pakistan being the nucleus of illegal nuclear trade, India's record has been brilliant. But the exposure of Abdül Qadir Khan⁶² Network of Pakistan and its

involvement in the nuclear programme of North Korea has heightened the concern of international community. The involvement of this illegal network in Iranian nuclear programme has also been discovered in recent times. Today, the world has become apprehensive about any nuclear cooperation between countries and this has slowed the pace of Indo-Russian nuclear cooperation.

Tense relationship with USA in the past

India-Russia nuclear cooperation has been a victim of US pressure in the past. It is worth mentioning in this context that Russia had denied honouring the commitment it had made to India about the supply of Cryogenic Technology due to American pressure. USA has always been apprehensive of India's ties with Russia. It always disfavoured the special relationship India maintained with Soviet Union before 1991 and with Russia after 1991. USA viewed India as a part of Soviet block thus their mutual relationship remained tense. In fact, barring few exceptions India and the US remained at loggerheads during the cold war period. USA's support to Pakistan was an additional factor. Pakistan joined the Western block much against India. Thus, India's bitter relationship with United States was the driving force of US curiosity behind the formation of NSG and other restrictive regimes which prohibited India from getting any outside support in its nuclear programme.

The relationship between India and USA was to a great extent responsible for India going nuclear. US's antagonistic attitude towards India deprived any major supply of nuclear technology to India from outside world. It will be worth-mentioning in this context that Russia which was a traditional friend of India denied honouring the commitment for supplying cryogenic engine to India under US pressure though, Moscow had earlier signed the deal to supply four cryogenic engines to India for its space research programme.

One way nature of trade

Indo-Russia nuclear cooperation has remained restrained and limited because of the very nature of nuclear cooperation itself. In the whole bargaining for nuclear cooperation the transfer of technology and nuclear materials seems to be one sided. This is more of the nature of buyer-seller relationship than a mutual cooperation between nation states. The flow of goods and technology from Russia to India is without any corresponding flow from other side. India is paying with cash to Russia for its exports. In fact, the whole trade between India and Russia is minuscule and nuclear trade comprises a tiny part of this whole trade. The joint research programme has started in some areas, for instance defense and space research. The joint research programme is not taking place in nuclear area to any considerable extent.

As far as the nuclear trade is concern, Russia's Ministry of Atomic Energy has been mainly responsible for whole gamut of any nuclear trade with India. According to some leading Russian critics, whole ministries are closely associated with certain companies in pursuing their short term economic interests and ignoring long term Russian national interests. In fact the charges of corruption were leveled against the ministry. A campaign against corruption was launched in spring 1999 by the then Prime Minister Primakov, which coincided with his other campaign to force Russian oligarchs to follow the law. This may have led to his downfall when he was removed in May, 1999.

The most export oriented ministries are the Ministry of Atomic Energy, the Russian Aviation and Space Agency and Ministry of Economics, which stand in some contrast to the Russian foreign ministry. The greatest Russian lobbyist for nuclear collaboration with India in recent times was the Minister of Atomic Energy, Yevgeny Adamov, who triggered a storm of controversy when he indicated in an interview with the newspaper "The Hindu", in December, 2000 that Russia might consider withdrawing from existing export control regime.

Adamov was making an oblique reference to the nuclear suppliers group which was formed in 1975. Adamov cited China as an example since it is not a member of NSG, but its part of the Zangger Committee which does not require full scope safeguards. The NSG guidelines for nuclear transfers did not demand full scope safeguards for non-nuclear states until 1992 following the discovery of Iraq's clandestine nuclear weapon programme. President Boris Yeltsin signed Decree No.312, which paralleled the NSG guidelines, though it exempted Russia's 1988 agreement with India to build two nuclear reactors at Koodankulam that provided for facility safeguards, thus meeting the requirements governing deals prior to 1992. (Manpreet Sethi, 2001)⁶³.)

In 1996, Yeltsin reaffirmed Russia's commitment to the NSG guidelines. However, Putin took a step soon after he took office distancing his country's policy from NSG by amending Russia's export control legislation in May, 2000, Decree No. 312 was modified to allow nuclear supplies to non- nuclear weapon states whose activities were not under full scope safeguards 'in exceptional circumstances'.(Olopally Deepa, 2002).⁶⁴

The position of Russia's Minatom (Ministry of Atomic Energy) was that the new Decree significantly expanded Russia's nuclear export capability and that it was linked to Russia's intent to assist the Indian programme. Indeed, Putin said as much when he noted in New Delhi the two more reactors in addition to Koodankulam were distinct possibilities. This was consistent with Adamov's promise in The Hindu interview that 'we will do our best to participate in India's ambitious programme to generate 20000 MW of nuclear power'. (Ibid)⁶⁵

In another positive signal, Russia came to India's rescue when India's Tarapur nuclear reactor came to the verge of closer, following the scarcity of nuclear fuel. Russia supplied badly needed enriched uranium fuel to Tarapur citing security reasons despite criticism from the West. This happened even before the passing of Indo-US nuclear deal by US Congress. The Russians were accused of hobnobbing with India only to dislodge the Americans from its growing relationship with India.

Evgeny Adamov was close to Putin who seems to have exerted strong influence on Indo-Russian nuclear policy. The Atomic Energy Head apparently not only had Putin's ear but was also close to certain influential business communities. According to some analysts, Putin's decision to sign the Decree in May, 2000 allowing nuclear supplies to non-nuclear countries which did not have full scope safeguards may have been a political move to support Adamov as the nuclear energy chief tried to increase nuclear sales abroad. (R.R. Subramanian 2001)⁶⁶

Critics argued that the head of Minatom had a foreign policy of his own, and that concerns expressed by foreign ministry officials were more often than not overridden by the drive for sales. Indeed, Adamov was perceived to have been replaced in March, 2001 partly for his outspokenness and enthusiasm for deals with Iran. His ouster gave rise to speculation that the Ministry of Atomic Energy may abandon its attempts to substitute its corporate policy for state policy in nuclear non-proliferation thus providing an opportunity for the Ministry of Foreign Affairs.

On the contrary, Adamov's successor, Alexander Rumyantsev, came out in favour of Russian nuclear assistance to India and Iran. Rumyantsev a former head of one of Russia's top nuclear labs, left no room for confusion and in a news conference, stated that cooperation with Iran on the Bushehr nuclear power plant was strictly civilian and in keeping with international commitments. Indeed, he indicated that the Russians were considering a second reactor at Bushehr and vowed to catch up, if work was lagging behind schedule. Regarding India Rumantsev took the long view and noted that 'India is our strategic partner. We want to ensure that there are no reproaches from the international community in this regard'.⁶⁷ (Sumit Chakravarti, 2003) He stated that Russia intends to build a nuclear power station in India despite international concern.

Rumyantsev's statements so far should put to rest any sentiment that the replacement of Adamov would have negative repercussions for Indo-Russian relations in the nuclear sector as initial analysis might have suggested. Indo-Russian nuclear cooperation would seem to have support at the highest levels of Russian leadership, at least for now. But it is

no secret that India would prefer to get nuclear assistance from France or any other nuclear country including US, and to that extent, India might be betting that the bait of its deals with Russia might eventually draw in others. Moreover, India is not likely to forget Russia's backtracking on the cryogenic engine technology contract in 1993 suggesting that it is not the most reliable partner. Thus, while the stage is being set for a higher level of nuclear cooperation, there is no guarantee that other interests and preferences will not take precedence in the future for either India or Russia.

India's present nuclear power programme

India's current nuclear programme is self-sufficient from various points of view. In the lack of any solid support base from outside, Indian scientific community has developed a programme of nuclear energy production which is more restrictive albeit indigenous. Most of the nuclear reactors operating in India, barring few exceptions, are built in the country. Even the fuel supply has been uncertain and based on ad-hocism. As a matter of fact, India currently has 17 operating reactors with a total installed capacity of 4120 MW. Of these 15 are PHWR.⁶⁸ The other two are Light Water Reactors (LWRs) built by the US at Tarapur in Maharashtra. These LWRs use enriched uranium as fuel and Light Water as coolant and moderator.

The real challenge is the nuclear fuel constraint. As we know, India's uranium reserve is very limited. It does not have sufficient uranium to run its nuclear reactor without external support. Secondly, the capacity factor is another constraint. If the capacity factor of the indigenous PHWRs was at a high off of 90% into 2002-2003, it has declined to 65% in recent times. This reflects the serious shortage in the supply of natural uranium to fuel the PHWRs operating in the country.

The opening of new uranium mines in mills has lagged behind the demand for that matter. There are uranium mines at Jaduguda, Turamdih, Bhatin, and Narwa Pahar, all in Jharkhand. A mill is operating at Jaduguda for processing the natural uranium into yellow cake, which is sent to the Nuclear Fuel Complex at Hyderabad to be fabricated into the fuel bundles that power the PHWRs.

According to the experts, the situation will soon be under control when a new mill at Turamdih for processing the natural uranium into yellow cake will be commissioned for trial run by the end of June 2007. A new mine at Bandurung in Jharkhand is already producing natural uranium ore and the stockpile will be sent to the Turamdih mill once it is commissioned. The Nuclear Power Cooperation of India Limited (NPCIL) which designs, builds, and operates nuclear power reactors in India and is the watchdog of India's nuclear programme has started the construction of new mines at Mouldih also in Jharkhand. Environmental clearance has been given for constructing a uranium mine and mill near Thummalapalli in Kadapa district, Andhra Pradesh. The land acquisition at this sight is also on. A public hearing was held at Nongbah Jerkin in Meghalaya on June 2007 on a uranium mine and mill to be set up near Domiasiat.

Five reactors are now under construction. They include the fifth and sixth PHWRs at Rajasthan and fourth at Kaiga, each with the capacity of 220 MW. The NPCIL is also building two LWRs each with the capacity of 1000 MW at Koodankulam, Tamil Nadu.

The Bharatiya Nabhikiya Vidyut Nigam Limited (BHABINI), a public sector undertaking of the Department of Atomic Energy is building a 500 MW Prototype Fast Breeder Reactor (PFBR) at Kalpakkam in Tamilnadu.⁶⁹ These six reactors will have a capacity of 3160 MW.

Of these six, Rajasthan-5 will attain criticality in August or September 2007. Rajasthan-6 and Kaiga-4 will be started up by March 2008. The PFBR will be commissioned in 2010. Thus the NPCIL has planned many reactors in the coming years although the operating of these reactors will be on different lines, if the Indo-US nuclear deal comes through.

The NPCIL has had a difficult time over the past year and a half with the delay in the arrival of equipment from Russia for the two reactors at Koodankulam. But now the situation is under control. Things are picking up. All the major equipments for both the units have arrived. Civil works had been completed 100% for both the units. Major

equipments in the reactor building, including equipment for the nuclear steam supply system for unit one has been erected. The process for building up Koodankulam power plant is on. Electrical systems are in an advanced stage of installation for this unit. Close monitoring is going on. With all out efforts being made to speed up the work, Koodankulam-1 will be operational in 2008 and its twin six months later.⁷⁰

As far as the new projects are concerned, the breaking of ground for the construction of two PHWRs of 700 MW each will take place at Kakrapar by the end of 2007 and in Rajasthan for two more PHWRs of similar capacity in 2008. Environmental clearance has been obtained for the projects at both the sites.

Thus, firm plans are underway to press ahead with India's indigenous nuclear power programme should, for some reason, the proposed Indo-US nuclear agreement not come through. The focus in the immediate future will be on Pressurized Heavy Water Reactors (PHWRs) that have become the workhorse of the Indian nuclear power programme. These PHWRs use natural uranium as fuel and heavy water as coolant and moderator.

Preparations are on course for the fifth nuclear power reactor at Rawatbhata in Rajasthan to reach criticality in August or September 2007. Work is also progressing well on two more heavy water reactors-Rajasthan-6 and Kaiga-4 to be started up by March, 2,2008. These three reactors have a capacity of 220MWe each. Thus, it is certain that India will take a big step forward in its indigenous nuclear power programme when excavation will begin by the end of 2007 for two PHWRs of 700 MW each at Kakrapar in Gujarat. The design of the 700 MW PHWR has been completed. Detailed engineering is in the full swing. These will be the biggest PHWRs to be built by the NPCIL.

Thus, India's nuclear programme is more or less self dependent and experts say that it has reached its saturation point. Thus, unless India gets outside support it cannot go any further. In fact PHWR has been the mainstay of India's nuclear programme which is an outdated technology. The arrival of FBR and LWR has brought technological revolution in nuclear field. India must switch on to these technologies if it has to achieve its nuclear energy production target.

Future prospects

The future of Indo-Russian relations looks bright. Both the countries are treading the path cautiously taking proper care of the sensibilities of the international community. Both the countries recognize the heightened international concern after the nuclear testing of North Korea and the high-end drama of Iranian nuclear programme. International community, especially the developed countries are becoming more and more concerned about the nuclear proliferation and exerting all round pressure on the neo-aspirants of nuclear power club. India's brilliant track record of nuclear safety and non-proliferation has strengthened India's standing in the world. Today, the international community is more receptive to India's concern due to these considerations. Indo-US nuclear deal⁷¹ is a symbol of this new confidence that international community has reposed in India's ability to serve the cause of non-proliferation and nuclear disarmament. By giving India its rightful place in the comity of nations, will not only boost India's confidence but will also rope in India as a responsible nuclear power country for tackling various problems of the world.

India's all-round growth in recent years has helped India to improve its international standing. It was not long ago that India's concerns about terrorism and other issues used to be dismissed on flimsy grounds. Today, the world is not only looking towards India but also trying to engage India in its various capacities. India's rise as an important destination of capital investment coincided with India opening its market has created synergic impact. Today, no country wants to miss their pie in India's growth story. In the wake of these changes the possibility of any stumbling block in the way of India's cooperation with Russia in nuclear sector is less.⁷²

Indo-Russian nuclear cooperation depends on the fact that how far both the countries succeed to make adequate scope for their relationship to suit the compelling dynamics of the world politics. As their relationship with the sole superpower of the world i.e. United States is changing for better or worse it will have its ramifications for their mutual relationship with each other. As India's goal of nuclear energy has been fixed higher,

India will need to enter into energy cooperation with various countries to get nuclear materials and fuel. This is also necessary in view of India's weak scientific base regarding the nuclear sector.

This is also well known that India's cooperation with Russia or any other third country now depends on the future of Indo-US nuclear deal. As the deal seems to be stuck in US congress⁷³ and the negotiations are heading nowhere, it has become necessary for both the countries to understand the importance of each other and accord them their due place. The future of Indo-Russian nuclear cooperation will be guided by the international dynamics of changing power equations and the diplomacy of both the countries to tackle those challenges. They will have to convince the international community about the positive side of Indo-Russian nuclear cooperation and their sincerity to the cause of disarmament and nuclear non-proliferation. The growing concern of international community about the climate change and deteriorating environment will help them to suggest the alternative way to solve the problem and nuclear energy as a viable source of energy will be able to address this concern as well. As the world will switch over to alternative sources of energy in place of fossil fuels India and Russia will be in a better position to help each other in nuclear technology field.

Thus, Russia-India nuclear cooperation is heading towards a future where international community is going to affect the whole course of this relationship. As Indo-US nuclear deal is yet to come before IAEA and NSG the future guidelines of these international nuclear regime is going to decide India's cooperation with Russia in the nuclear field.

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5. An approach to politics based on the actual circumstances and needs of one's own people, not on morals or ideas.
6. Government of India (2007), *India 2007*, Publication Division, Ministry of Information and Broadcasting, New Delhi.
7. CIRUS is the abbreviation of Canada-USA nuclear reactor.
8. Jaina and Mathur, 2004, *A history of the modern world 1500-2000*, Jaipur, Jaina, Prakashan Mandir.
9. Nuclear Suppliers Group was formed in the wake of India's nuclear explosion in 1974 to stop any further proliferation of nuclear weapon.
10. J.N.Dixit, *India's Foreign Policy 1947-2003*, (2003) New Delhi, Picas Books.
11. Peaceful Nuclear Cooperation is a generic term often used by almost all countries before going for nuclear tests though India's case was somewhat different in the sense, that it was not directed towards any country.
12. Non-Proliferation Treaty was signed in 1968 which set up certain guidelines to control the nuclear trade and transfers.
13. Nixon's secret visit to China was facilitated by Pakistan's mediation and a incident which had far-reaching influence in cold war politics.
14. NAM was founded in 1955 when a conference was held in Bandung in Indonesia. It's first official meeting was held in Belgrade, Yugoslavia in 1961.

15. Jaina and Mathur, (2004), *A History of the modern world 1500-2000*, Jaipur, Jain Prakashan Mandir.
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17. Ibid
18. Summary of World Broadcast, BBC, June 3,1998
19. Ibid.
20. It was Primakov who proposed trilateral cooperation between India, China and Russia during his visit to India in 1998 as Prime Minister of India.
21. Koodankulam is a coastal town situated in the Tamilnadu state of India.
22. FSS is IAEA provisions under which a non-nuclear country is given assistance in nuclear field in lieu of their accepting IAEA inspection measures.
23. Comprehensive Test Ban Treaty was proposed in 1997 for checking proliferation of nuclear weapons.
24. The Hindu, January 26, 2007.
25. Alfred Lyall, British historian, as quoted in “expansion of British Dominion”,(eds) R.C. Majumdar, H.C.R Chaudhary and K.K. Dutta, *An Advances History of India*, 1977,Macmillan Publication, Page 676.
26. John Foster Dulles, former secretary of state(USA),as quoted in (eds.) Vipin Chandra, (1999) *India after Independence* ,New Delhi, Penguin Books,Page-150.
27. 9/11 refers to September 11, 2001 when four Al-Qaida hijacked aircraft hit World Trade Centre, and Pentagon, US military headquarter in United States.
28. As per the recent data India is world’s largest arm’s buyer.Though it is trying to diversify its sources, Russia is still the largest supplier.
29. Indian economy before 1991often criticized due to its overregulation and undue interference of the government.
30. Mr. P.V Narsimharao was the Prime minister of India when India had to mortgage 150 million tonne of gold with the Swiss bank to get money to bail out itself from the balance of payment crisis.
31. Latest data puts it at 9.4%

32. Ibid.
33. The deal signed on 18 July is still not been passed by the legislature of both the countries and it's future is still uncertain due to some differences between them.
34. UN report on World Diaspora 2006.
35. Xingiang is the western province of China where Uighuer seperatists are fighting for seperate statehood as the region is muslim dominated province of China.
36. Summary of World Broadcast (SWB), BBC, SU/3225 B/1.
37. Colour revolutions are US supported "pro-democracy" movement in the former Soviet states.
38. Sethi, Manpreet (2000), "Indo-Russian Nuclear Cooperation: opportunities and Challenges", *Strategic Analysis*, 34(9), Page 1751-61.
39. US president George Bush has officially walked out of Anti-Ballistic Missile Treaty of 1972. This is a severe jolt to concept of deterrence and opposed not only by Russia but China as well.
40. Proliferation Security Initiative has been signed by 15 countries so far. Though India has not signed it New Delhi is cooperating with United States in confronting the menace of illegal smuggling of nuclear materials on high sea.
41. Heywood, Andrew, (2002) *Politics*, New York, Palgrave Foundations.
42. Communist party of Soviet Union
43. Chinoy, Anuradha, (2001) *The making of new Russia*, New Delhi, Har-Anand Publications Pvt. Ltd.
44. Ibid.
45. North Atlantic Treaty Organization.
46. G8 is an organization of eight most developed countries. It's members' are-USA, France, U.K, Italy, Germany, Japan, Canada and Russia. The group was formed in 1975, though Russia joined much later in 1997.
47. UNFCCC is a UN affiliated body which monitors the climate situation in the world and prescribes proper methods to deal with them.
48. Organization of Petroleum exporting countries was formed to put pressure on the western countries supporting Israel against Palestine by controlling the price of fuel.

49. Non-Proliferation Treaty was signed in 1968 to stop the further proliferation of nuclear weapon after China tested its nuclear device.
50. Vladimir Putin was the chief guest of India's republic day (26 January,2007)
51. Under Safety Exception Clause Nuclear fuel can be supplied to a nuclear power plant if there is a threat of nuclear accident or radioactive pollution due to the untimely closer of the plant.
52. Quito Protocol which was signed in 1997 was rejected by US as it obliges puts restriction on developed countries to cut their green house gases emission by 5.2% without and corresponding obligation on developing countries including India and China.
53. Parthasarathi, Ashoka (2002), Cooperation with Russia in atomic energy reach new heights, *Mainstream*, 40(6), Page 27-29
54. Low Enriched Uranium is generally used in power reactor which is generally 5% enriched, while more than 95% enrichment is needed to make nuclear bomb.
55. Joint Statement on the Cooperation in Peaceful Use of Nuclear Technology signed during Putin's visit to India on January 26, 2007.
56. Ministry of Defence (2007) Government of India, Institute of Defence Studies and Analysis *Strategic Digest February 2007, Page157.*
57. Ibid.
58. Ibid.
59. Full Scope Safeguards covers the nuclear activities sanctioned by IAEA for peaceful uses of nuclear technology.
60. Now India is focusing on 1000MW or higher capacity nuclear reactor to reach nuclear power generation target by 2020.
61. Rogue state is a term used to refer a state where state lever is controlled by the whims of a single person or some elite and democratic element are conspicuous in its absence in policy making apparatus.
62. Abdul Qadir Khan was the top nuclear scientist under whom Pakistan tested its nuclear weapons in Chagai Hills.
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68. Pressurized Heavy Water Reactor
69. This is the first Breeder Reactor to be built in India.
70. The Hindu, June 10, 2007
71. March 2,2006
72. The Times of India, June 17,2007
73. Three main issues namely, right to reprocessing, moratorium on nuclear test and uninterrupted supply of nuclear fuel, have become the stumbling block in Indo-US nuclear deal.

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