INDO-US STRATEGIC RELATIONS: THE NUCLEAR DIMENSION

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The year 2005-06 will be remembered in the history of Indo-US relations as an important milestone in the mutual rediscovery of the two democracies. Even though the nature of interaction had begun to change from before the dawn of this century, it was during President Bush's visit to India in March 2006 that the relations reached a historic acme. On the occasion, India and the US reaffirmed the multifaceted relationship, encompassing issues as diverse as terrorism, science and technology, agriculture, infrastructure, health, commerce, energy and defence[1], as visualised in the joint Indo-US statement of July 18, 2005, signed when Prime Minister Manmohan Singh had visited the US.

The star of the show in March 2006, however, was the agreement on the blueprint for a separation plan of India's nuclear programme. In the weeks just before the run up to his arrival, officials on both sides invested extraordinary time and energy to address the complex issues involved. Negotiations, expectedly, were long-drawn and messy, going over complicated ground and grappling with hard, long-held positions. In the end, however, the two agreed on the list of nuclear reactors that India would subject to international inspections

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1. Cooperation in the defence sector has emerged as one of the most intense and fastest growing components in the bilateral relationship. It was given direction by the "New Framework for US-India Defence Relations" signed between India's Defence Minister Pranab Mukherjee and US Defence Secretary Donald Rumsfeld in June 2005. The agreement underlines a convergence of interests on "combating terrorism and violent religious extremism, preventing the spread of weapons of mass destruction, protecting the free flow of commerce, and promoting security and stability in Asia." Accordingly, Indo-US long-term bilateral defence cooperation includes defence industry ties and the possible outsourcing of research and production by US defence contractors to India; conduct of joint exercises; exchange of doctrines, high-level visits, courses, seminars, training exercises, etc to promote mutual understanding, familiarisation and confidence-building.

under the Indian Atomic Energy Agency (IAEA). This separation plan was submitted by President Bush to the US Congress immediately on his return. The US Administration would seek Congress' approval to adjust US laws and policies to enable full civil nuclear energy cooperation and trade with India. Once this was through, India would negotiate an India-specific safeguards agreement with the IAEA, undertake a phased opening of its nuclear reactors for international inspection and negotiate and sign an Additional Protocol.

Given its unprecedented nature, nuclear cooperation has become the defining feature of the evolving Indo-US relations. It marks the singular most significant departure from long-held positions. Until now, the US had viewed a nuclear weapons capable India as an outcast, to be chastised for "illegal" possession of this weapon of mass destruction (WMD). New Delhi was advised, repeatedly during the Clinton years, to "cap, roll back, and eliminate its nuclear weapons programme." It was also kept outside the system of regulated nuclear commerce unless it accepted full-scope safeguards on its nuclear facilities. However, in a sharp reversal of this approach in 2005, President Bush offered the promise of a constructive nuclear engagement with India. In this *volte-face* was implicit the acknowledgement of India as a rising economic power with substantial energy requirements, and as a "responsible state with advanced nuclear technology." The Indian prime minister confirmed this in his statement before the Parliament on Civil Nuclear Energy Cooperation with the US: "The existence of our strategic programme is being acknowledged even while we are being invited to become a full partner in international civil nuclear energy cooperation."[2]

The actual whirlwind that led to the proposal for civilian nuclear cooperation in exchange for reciprocal Indian measures was whipped up by a number of diverse, seemingly dispersed, but often significantly linked trends. The most prominent among these are India's impressive economic growth trajectory; the realisation that it has a huge appetite for electricity that impinges on the global energy market, as also on the global environment; the rise in environmental concerns from greenhouse gas (GHG) emissions; a worldwide resurgence of interest in nuclear power; a tacit acknowledgement within the US about its own

2. Prime minister's statement in Parliament on February 27, 2006. Full text available in *The Hindu*, February 28, 2006.

limitations, especially as a result of its ongoing experience in Iraq; the US' rediscovery of India post-9/11; a new found respect for India's democratic values; a commonality of interests manifest in its fight against terrorism and WMD proliferation; and the growing influence of the Indian diaspora in US politics and economy.

These developments, in varying degrees, motivated the Bush Administration to push for a strategic relationship with India, with a prominent nuclear dimension. As is evident, the evolving nuclear relationship envisages a journey along a new and yet untrodden path. Not surprisingly, therefore, it has evoked much disquiet amongst the officialdom, the strategic community, the scientists, the intelligentsia and the media in both countries. There are misgivings on the Indian side about how much giving in India would end up doing, while in the US, fears expressed at the Congressional hearings and by some non-proliferation experts range from not seeking enough concessions from India to the impact of the agreement on non-proliferation.

For a country of India's size, population and economy, targeting ambitious growth rates of eight to ten per cent over the next two decades, safeguarding energy is a strategic priority.

This paper examines the many short and long-term implications of the nuclear dimension of the Indo-US strategic relationship. The first section establishes the rationale for expansion of nuclear energy for India's energy security and particularly examines the unique advantages of nuclear power in India's energy mix. The second segment analyses the benefits of Indo-US civilian nuclear cooperation for both countries. The penultimate section identifies and addresses the fears that have been expressed on both sides with respect to the agreement. The paper concludes by suggesting the possible way ahead.

INDIA'S NEED FOR NUCLEAR ENERGY

Economic development and growth are the twin aspirations of an emergent India. But, among other factors, future economic growth will depend on the long-term availability of energy, particularly in the form of electricity. For a country of

India's size, population and economy, targeting ambitious growth rates of 8 to 10 per cent over the next two decades, safeguarding energy is a strategic priority. This will have to be available in increasing quantities and from sources that are stable, dependable, and low-cost. But, presently, India imports a bulk of its energy requirements of coal, oil and gas, and, hence, the urgency to secure sources of supply cannot be underestimated. In an attempt at diversifying its energy mix, India has developed renewable and other alternative sources of energy, including nuclear. It is the latter which is the focus of worldwide attention today. A global nuclear renaissance is well timed with India's desire for nuclear expansion and this source has tremendous potential for a power hungry India.

Growing Energy Demand

World Bank estimates, corroborated by a draft report prepared by the Expert Committee of the Planning Commission on Integrated Energy Policy, place growth rate of energy demand in India at 5.3 per cent per annum in the first decade of the 21st century and by 2020, it is expected to grow by 10 per cent per annum.[3] The Power Policy of India promises power availability to all by 2012, and electrification of all villages by 2009.[4] To meet such targets, it has been estimated that by 2031-32, electricity generation must grow from the present 633 bkWh to 3,880 bkWh. As the economy becomes more technology dependent in the coming years, electricity would play an even greater role as an economic multiplier. In case this demand is not met, the loss to India's economy, though difficult to quantify in figures, would be huge. Some contend that if the energy sector in India could reach international levels of performance, the country's gross domestic product (GDP) would go up by an additional 2 per cent per annum.[5] Therefore, increasing energy generation to meet the growing demand is critical for continued economic growth and social development.

3. Draft Report of the Expert Committtee on Integrated Energy Policy prepared under the chairmanship of Dr Kirit Parikh, member (energy) Planning Commission, Government of India. Full report available at webiste of Observer Research Foundation.
4. M.R. Srinivasan, "The World's Energy Resources and Needs," *Nuclear India*, vol.39, no. 1-2, July-August 2005.
5. R. K. Pachauri, "Defining an Integrated Energy Strategy for India," TERI website at http://www.teriin.org/energy/

Limited Domestic Fuel Sources

In the present Indian energy mix, coal is the dominant fuel, meeting 55 per cent of primary energy consumption, with the share of oil being 36 per cent of total energy consumption. But, although India's coal reserves comprise 8 per cent of the world total and the country is its fourth largest producer, only 20 per cent of the total coal transported to power plants is of superior grade with ash content of 24 per cent or less. The remaining 80 per cent is of inferior grade, which when used in thermal plants not only poses environmental problems, but also raises the cost of operation and maintenance, and adversely affects plant performance.[6] Over the years, therefore, imports of high quality coal have risen from 6 metric tonnes (MT) in 1991/92 to 20 MT in 1999/2000, a rate of growth of 16 per cent a year.[7]

The country's hydrocarbon reserve is also small at 0.4 per cent of world reserve. In fact, current reserve-to-production ratios for coal, oil and natural gas available in India are 235, 23 and 35 years respectively.[8] By 2030, India's demand for oil will require imports of almost five million barrels a day, unless there is a substantial increase in domestic petroleum finds and exploitation. This will increase India's import dependence for crude oil from 70 per cent in 1999-2000 to 90 per cent in the coming decades.[9] Natural gas is emerging as a replacement for oil, but this too will have to be imported. Indian demand for natural gas is expected to grow by over 5 per cent per annum so as to meet 13 per cent of primary demand, but this too will be met by 70 per cent imports.[10] This scenario is alarming not only because of the pressure it places on scarce foreign exchange resources, but also because it raises energy vulnerabilities, a fact that for a large country like India is neither affordable, nor strategically prudent.

Growing Global Environmental Concerns

When the bulk of a country's energy is sourced through fossil fuels that disperse

6. Sajal Ghosh, "Sustainable Energy Policies for Clean Air In India," *Background Paper* prepared for the Atlantic Council, USA, p. 9.
7. Ministry of Commerce, Annual Report (New Delhi: Ministry of Commerce, 2001).
8. Ghosh, n. 6, p.9.
9. Jasjit Singh, ed., *Oil and Gas in India's Security* (New Delhi: Knowledge World, July 2000), p.ix.
10. Jasjit Singh, "Growing South Asian Interests in the Persian Gulf Region: Problems and Opportunities," *Strategic Analysis*, vol.23, no.9, December 1999.

carbon dioxide (CO_2) directly into the air, environmental consequences like greenhouse effect and global warming become a serious cause for concern. GHG emissions from thermal power plants cannot be wished away despite improvement in these technologies and the application of stringent environmental measures. Rather, with the anticipated upsurge in energy production from thermal plants, the effects of pollution will be evident in climate change and ozone depletion. This connection was recently made by the United Nations Environment Programme (UNEP) in a report that described 2005 as the most expensive year due to severe weather conditions around the world. Munich Re Foundation, an insurance company, has estimated that more than $ 200 billion were lost globally because of climatic upheavals traceable to pollution.[11] In order to arrest these disturbing trends, environmental experts warn that the overall global CO_2 emissions should be cut from 25 billion tonnes annually to 10 billion tonnes, even as overall energy production increases.

The strategies and technologies India adopts to meet its energy demand will have critical implications for its own, and the global environment.

At present, India's per capita energy consumption and, hence, the resultant carbon emissions are relatively low. In 1997-98, the average per capita energy consumption of India was less than 0.5 tonnes of oil equivalent (TOE) compared to the world average of 1.7 TOE.[12] Consequently, per capita carbon emissions of India in 1997 were only 250 kg of carbon per person, which was approximately one-quarter of the world average and less than 0.05 per cent of that in the US[13]. Despite these low figures, India is still the world's sixth largest carbon emitter. This ranking would certainly change in the coming years as India emerges as the world's most populated and urbanised country by 2025, and even more so if it continues to retain coal as the predominant fuel in its energy mix. It is estimated that India's total CO_2 emissions will rise from 0.9 billion tonnes to 2.3 billion tonnes by 2030, making it one of the largest carbon emitters.[14]

11. "Storm Signals," Editorial in *The Times of India*, December 10, 2005.
12. Amit Kumar, "Energy Scenario in South Asia," *Energy Technology News* (TERI), Issue 1, October 2000.
13. Ibid.
14. World Nuclear Association, http://www.world-nuclear.org

Given these estimates, the strategies and technologies that India adopts to meet its energy demand will have critical implications for its own, and the global environment. Nuclear power, in this scenario, could prove helpful since it has been widely accepted as a zero carbon source. A comprehensive analysis of GHG emissions from different electricity generation chains shows that nuclear power is one of the less carbon intensive generation technologies, with no stack emissions. In fact, emissions from the full energy chain (FEC) amount to only about 2.5-5.7 grams of GHG (expressed as grams of C-equivalent) per kWh of electricity produced (gCeq/kWh), compared to some 105 to 366 gCeq/kWh for fossil fuel chains and 2.5-76 gCeq/kWh for renewable energy chains.[15] Hence, it is estimated that today's nuclear reactors, when viewed as an alternative to coal-generated electricity are already preventing emissions of 2.5 billion tonnes per year of CO_2 – which is about half the CO_2 emitted by the world's motor vehicles.[16]

Nuclear power's value as a carbon-free electricity source would be further enhanced if and when CO_2 emissions begin to carry a significant "price". While the possibility of this happening is still uncertain, given the ambiguity over the fate of the Kyoto Protocol, sooner or later, the need for carbon free sources of energy will be felt. Once a price is placed on emissions and emission trading gets underway, it would provide incentives for investment in carbon free electricity technologies like nuclear power.[17]

India's Unique Benefits From Nuclear Power

With experience of five decades in the nuclear field, India is today capable of designing, building, operating and maintaining nuclear power plants of varied types and capacities[18], besides being able to manufacture all associated equipment and components, and produce the required nuclear fuel and special

15. Ibid.
16. Ibid.
17. In fact, it is noteworthy that even the MIT study conducted in the US on the "Future of Nuclear Power," recommends the retention of nuclear, precisely because it is an important carbon-free source of power that can potentially make a significant contribution to future electricity supply, and reduce GHG emissions. MIT, *The Future of Nuclear Power* (Massachusetts: MIT, 2003).
18. India operates nuclear plants of types as different as boiling water reactors of 160 MWe, pressurised heavy water reactors of 220 and 550 Mwe, and is constructing the light water reactors of 1,000 MWe with Russian help. It is also constructing the 500 MWe prototype fast breeder reactor as well as developing the advanced heavy water reactor for thorium use.

materials. Having amassed substantive reactor experience in pressurised heavy water reactor (PHWR) operations, India has graduated to the commercial demonstration of the fast reactor programme. At the same time, the country is developing the reactor and associated fuel cycle technologies for thorium utilisation, with a one of its kind 30 KW(Th) research reactor, Kamini, already operational. Of course, the thorium cycle does face problems of high cost and technical complications in fuel fabrication and reprocessing because of high radioactivity of uranium-233 (U-233). But then, India is the only country pursuing this technology. Even the World Nuclear Association, which is dedicated to the promotion of nuclear technology, sees little future in it while abundant uranium is available. However, uranium availability for India is a major constraint on nuclear power expansion.

The Indian uranium reserves at about 0.8 per cent of the world are considered to be insufficient for a programme beyond 10,000 MWe if uranium is used on a once-through basis and then disposed off as waste. India has, therefore, undertaken spent fuel reprocessing to supplement its nuclear fuel resources with recovered plutonium. In a three-stage programme, the available uranium will eventually be used to harness the energy contained in non-fissile thorium, of which India possesses about 32 per cent of world reserves or 360,000 tonnes of high quality thorium. But even best estimates suggest that the promise of thorium can be realised only by 2035. Until then, if India has to make the best use of its nuclear experience and expertise and accelerate its nuclear generating capacity, it must have access to imported nuclear fuel. The Indo-US agreement offers it this possibility. India has the capacity, the technology and the will to expand its nuclear programme, even without international cooperation. But since this may take longer, resulting in low and costly energy availability, and slow economic growth and human development, the proposed US-India civilian nuclear cooperation offers a viable proposition.

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BENEFITS OF INDO-US NUCLEAR COOPERATION FOR INDIA

As is evident from the above analyses, energy security is a major challenge before India and there is a dire need to add additional generation capacities from diverse sources. The Indo-US civilian nuclear agreement offers one way of strengthening India's energy security. Of course, the opening up of civilian nuclear commerce would not immediately impact the electricity generation graph in India, given that it is yet to be enabled by the requisite amendments in American laws, subject to competitive bidding in India, and overcome the mandatory licensing and regulatory procedures. Each one of these processes will take time. However, the agreement holds the relatively immediate promise of making nuclear fuel available to India from the international market, thereby enabling it to expand its nuclear programme based on indigenous reactor construction plans. Meanwhile, the eventual entry of global players would provide the long-term assurance of energy to the country as demand surges with economic growth. The additional capacities would gradually become supplemented by home-grown fast breeder reactors (FBRs) and advanced heavy water reactors (AHWRs) to facilitate the availability of environmentally friendly energy in India well in time to avoid stagnation of human development.

Energy security is a major challenge before India and there is a dire need to add additional generation capacities from diverse sources.

Secondly, the agreement holds the promise of opening up the larger gamut of high technologies denied heretofore to India. This is to be enabled through a long-overdue reorientation of the non-proliferation order to accommodate India's unique status on two counts: one, as an energy hungry, developing economy that impacts global energy security and environmental sustainability; and, secondly, as a responsible state with advanced nuclear technology that has always maintained the highest support for non-proliferation. This would make it

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possible for India to break out of its technological isolation and enter into commerce in nuclear and other dual use technologies with other global players. Other benefits may accrue from initiatives such as the organisation of workshops on best practices for nuclear power plant design, new concepts in construction, commissioning operations, safety, life extension and regulatory oversight. Such exchanges of information would provide India with insights on developments in these fields elsewhere, those that it has been insulated from for so long.

Thirdly, the cooperation will facilitate Indian participation in global nuclear research and development initiatives, such as the international thermonuclear energy reactor[19], the Global Nuclear Energy Plan, etc. These multilateral initiatives recognise Indian nuclear expertise and provide an opportunity for Indian scientists to play a major role in them. Besides, India has also accepted the US invitation to participate in the Future Gen project for creating the world's first zero-emission, integrated sequestration and hydrogen production research plant. India is also likely to join the Integrated Ocean Development programme, an international drilling programme for scientific deep-sea research led by the USA and Japan. This will be an important step towards harnessing hydrates as a source of energy.[20] Therefore, the civilian nuclear cooperation agreement facilitates a wider opening of international research opportunities in pioneering energy fields for India.

Lastly, but not insignificantly, the agreement embodies a tacit recognition of India as a state with nuclear weapons. It offers New Delhi the chance to keep its strategic nuclear programme even as it is accommodated in a non-proliferation regime that had long insisted on full-scope safeguards for any cooperation with India. Therefore, the agreement enables a long-standing 'target' of the non-proliferation regime to become a 'partner' in the establishment of a new global nuclear order.

BENEFITS OF INDO-US NUCLEAR COOPERATION FOR THE US

In several recent articulations of their perception of the emerging worldview, officials of the Bush Administration have placed India as an important global

19. India was invited to join ITER on December 6, 2005. The main ITER facility will be in Cadarache, France, and other participating nations include the US, EU, Japan, Russia, South Korea and China.
20. "India to Take Part in Future Gen Poject," *The Hindu*, March 3, 2006.

player in international relations. They contend that for India to be able to play this role, it needs to be assisted in meeting the challenges of achieving sustained and sustainable economic growth through significant and meaningful cooperation on the issue of energy security in general, and expansion of clean, proliferation resistant nuclear power, in particular. Therefore, the nuclear cooperation agreement, first of all, allows the US to reach out to a rising economic power, whose economic growth could serve as an engine for the global economy.

Secondly, nuclear cooperation enables the US to transform a "unilateral Indian commitment to non-proliferation into a formally verifiable and permanent international responsibility."[21] Even though India has always upheld the principles of non-proliferation even when outside the regime, the implementation of the deal envisages a clear separation of India's military and civilian facilities. India has offered to commit 65 per cent of its nuclear generation capacity to IAEA safeguards. Given the extent of India's nuclear expertise in the entire nuclear fuel cycle, having such a large component of its nuclear generating capacity under verifiable safeguards is no mean achievement.

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Thirdly, the expansion of nuclear power to meet growing energy needs would save India from becoming a "chimney for greenhouse gases," as described by President Jacques Chirac during his visit to India in February 2006. Environmental concerns are on the rise and the ability of India to meet its energy requirements in an environmentally sustainable manner would have global implications.

Fourthly, from an American perspective, the cooperation that helps India become a "global player" also provides the US with an opportunity to counter-balance China. The US today holds that a strong India could help stabilise the geo-political order in Asia, besides being a partner on many global issues. Accordingly, the US now looks at Indian nuclear weapons as a factor that can buttress American strategic weight in the region. For example, Ashley Tellis has observed that placing India at a disadvantage vis-à-vis Beijing would "not only undermine Indian

21. Ashley Tellis, "Should the US Sell Nuclear Technology to India?" Part II, *Yale Globa Online*, November 10, 2005.

security but also US interests in Asia in the face of the prospective rise of Chinese power."[22] Robert Blackwill, former US ambassador to India during Bush's first term in office, too echoed a similar opinion when he questioned, "Why should the US want to check India's missile capability in ways that could lead to China's permanent nuclear dominance over democratic India?"[23]

Fifthly, it serves as a means to reduce the geo-political importance of the politically volatile Middle East by reducing global consumption of oil. President Bush has emphasised the need for his own country to reduce its addiction of oil. But that by itself will help little unless other major consumer nations like India too reduce their dependence. Therefore, by offering nuclear energy cooperation, the US hopes to moderate India's hydrocarbon demand, and, thereby, release pressure on this resource to keep prices low.

Lastly, the agreement envisions a huge market potential of nuclear and other defence and trade opportunities for US commercial interests in an economically vibrant India. It is in the self-interest of the American nuclear industry to reactivate its spare industrial capacities by investing in an expanding Indian nuclear market. Cooperation in this field is also expected to provide a fillip to military hardware purchases from the US.

THE CONCERNS OF INDIA AND THE US

The actual implementation of the agreement is contingent on a number of reciprocal measures to be taken by both countries in a phased manner. At the same time, the two democracies are grappling with real and hypothetical fears that have been raised in several quarters. The following paragraphs identify and assess the apprehensions prevalent on both sides.

INDIAN CONCERNS

Nature of Indo-US Relationship

Soon after its independence, India opted for a policy of non-alignment that

22. Ashley Tellis, "The US-India Global Partnership: How Significant for American Interests?," Testimony before the House Committee on International Relations, http://www.ceip.org, August 2005.
23. Robert Blackwill, "A New Deal for New Delhi," *The Wall Street Journal*, March 21, 2005.

kept it insulated from the system of alliances that existed during the Cold War. Coloured by this historical experience, most Indian strategic analysts perceive the growing closeness with the US as eventually resulting in loss of autonomy in strategic decision-making.[24] Many consider the US as an unreliable nation that can only interact with others as a hegemonic, dominant power. Some even contend that India would become a tool for the US to undertake "low-end operations" in Asia while the US military concentrates on "high-end fighting missions."[25] It is also believed that the relationship is being cultivated by the US to deal with the strategic challenge of China, by using India as a "swing state". Such viewpoints visualise the Indo-US relationship developing into a kind of military alliance of the kind that the US has with South Korea and Japan.

While such opinions draw sustenance from American articulations of the kind, India must be aware of them, but not intimidated by them. It needs to be pointed out that the present Indo-US relationship is evolving in the form of a "partnership" and not an "alliance".[26] As partners, even though unequal, both sides are expected to treat each other with respect, understanding the inevitability of differences that could emerge, based on national interests. But their mutuality of interests is expected to hold them together, while still leaving room for individual concerns. India, today, is a more developed, confident, economically secure and technologically advanced state that has embarked on this relationship with a clear understanding of its national interests.

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24. This point of view is encapsulated by Bharat Karnad, "Indo-US Strategic Partnership: Nuclear Deal—Partnership or Subordination?" *Indian Foreign Affairs Journal*, vol.1, no.1, January-March 2006, pp. 7-16. He opines that the Indo-US nuclear deal "seals India's role as an American satrap and stalking horse in the southern Asian region."

25. Sidhharth Varadarajan is an exponent of this viewpoint and quotes from a report commissioned by the Pentagon in 2002 on Indo-US Military Relationship: Expectations and Perceptions. For more, see Varadarajan, "Indo-US Strategic Partnership: Losing Sight of the Big Picture," *Indian Foreign Affairs Journal*, vol.1, no.1, January-March 2006, pp. 21-31. Also see Zia Mian and M.V. Ramana, "Wrong Ends, Means and Needs: Behind the US Nuclear Deal with India," *Arms Control Today*, January-February 2006

26. The difference between the two has been lucidly brought out by K. Subrahmanyam, "Indo-US Strategic Partnership: Partnership, Not Alliance," *Indian Foreign Affairs Journal*, vol.1, no.1, January-March 2006, pp. 1-7.

Significantly, in its nuclear negotiations with the US, India has parleyed from a position of strength and held on to its convictions with confidence.

In the emerging polycentric world, a demographically vibrant, geographically well-placed, technologically advanced, and economically strong India has a definite role to play. Its relationship with the US provides it with an opportunity to extract and exert leverages that can further its national interests. Though the US overtures at nuclear cooperation may well be based on the calculation of its own interests in Asia and the world, it would be foolish to lose this chance to reposition India in the emergent nuclear and global world order.

Indian concerns on separation coalesce around four major issues.

Separation of Facilities — How and How Much

In the run up to the visit of the US president to India, a debate raged on the kind of separation of nuclear facilities and assets that should be undertaken for India to become eligible for civilian nuclear cooperation. The US stipulated that the separation plan would have to be "credible, transparent and defensible," indicating that it should include a majority of India's nuclear programme on the list of civilian facilities. However, the Indian strategic and scientific community expressed wariness and advised extreme caution.[27]

The Indian concerns on separation coalesce around four major issues: the status of fast breeders, the cost of the exercise, the impact of separation on India's strategic capability and the nature of IAEA safeguards that would be applied to India. Of these four, the first issue has since been settled by way of the non-inclusion of FBRs in the civilian list and the American acceptance of this stand.[28] A second fear relates to the cost of the exercise. Notably, India will be undertaking this exercise at a time

27. A former Director of BARC, A. N. Prasad, even called any separation "impractical." Quoted by M. Zuberi, "The Nuclear Deal: India Cannot be Coerced," *ORF Issue Brief*, no. 4, November 2005.

28. Two opinions particularly emerged on the issue of fast breeder reactors. While some like C. Raja Mohan (see his writings in *The Indian Express* during February 2006) believed that for the sake of the deal, it would even be acceptable to place the nascent FBR technology and the prototype reactor under safeguards, several others, especially from the DAE and scientific community (for instance, A.N. Prasad, former director, BARC, expressed these fears in an article in *The Hindu*, July 18, 2005) expressed opposition to any such move on grounds of proprietary concerns and the "nuisance value" of the IAEA, as also for strategic reasons. For this side of the picture, see interview of DAE Chairman Anil Kakodkar to *The Indian Express*, February 2006 and R. Ramachandran, "Is Breeder Needed for Strategic Reasons," *The Hindu*, February 22, 2006.

when most other nuclear weapon states (NWS) have either abandoned such attempts or never undertook any. In fact, the US itself, ended the formal separation in 2003 when the Tennesse Valley Authority's commercial Watts Bar nuclear plant resumed operation to produce tritium for nuclear weapons, besides electricity, since the US Administration found this a cheaper option. But for India, the building of firewalls between its military and civilian programmes is a precondition to cooperation. While an exact quantification of the cost appears difficult, given that the Indian nuclear programme is ongoing and anyway in a phase of expansion, that there will be an additional burden cannot be denied since some additional facilities, either in the civilian or military sector might need to be duplicated. Yet Anil Kakodkar, the Department of Atomic Energy (DAE) chairman has suggested that the cost will "not be excessive, particularly because we are going to implement the separation plan in a phased manner over a period of time."[29]

The third concern regarding the impact of separation on capping India's weapons capability is dealt with separately in a following section. The fourth issue relates to the kind of safeguards that would be applied to India. As per the joint statement, India needs to accept safeguards on the same conditions and terms as the US. But since then, the Indian prime minister in his statements to the Parliament has clarified that the safeguards would be "India-specific" given the unique nature of India's nuclear status. While India has accepted "in-perpetuity safeguards," it has managed to build in an exit clause in case fuel supplies are cut off. During further negotiations on this, India will have to take adequate care to protect its proprietary technologies. Some scientists have also cautioned that India must also prevent companies like BHEL, L&T, and Godrej that have been manufacturing nuclear components from being subjected to intrusive inspections since some of them are fabricating components for the strategic programme.[30]

Impact on India's Energy Security

Many fear that by making itself dependent on imported nuclear fuel, India would end up replacing one type of dependency (of fossil fuels) for another (of

29. Interview of Anil Kakodkar with *The Hindu*, March 17, 2006.
30. A. Gopalakrishnan, "Don't Compromise India's Dignity," *The Asian Age*, March 1, 2006.

nuclear fuel). They opine that India would become hostage to enriched uranium fuel supply, which could be terminated by the supplier nation at will and whim.

However, two issues must be kept in mind while addressing this concern. One, while every type of fuel dependency raises vulnerabilities, in the case of nuclear fuel imports, India would be using them to generate additional capacities as it graduates to the second (FBR) and third (AHWR) stage of its nuclear programme that would eventually make it self-sufficient in nuclear fuel. Fossil fuels offer no such hope of ever facilitating indigenous resource availability. Rather, increasing dependence on fossil fuel imports would only increase risks as resources dwindle globally and prices rise. Secondly, as per the agreement, India has been promised fuel supplies in perpetuity, including a clause that the US and India would enter into a trilateral arrangement with the IAEA so that India could bank on other suppliers in case of withdrawal of the US for any reason.

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Impact on India's Defence and Deterrence

Many in the Indian strategic community fear that the civilian nuclear cooperation agreement would limit and control India's nuclear weapons capability by restricting the build-up of fissile material, since many reactors would come under IAEA safeguards.[31] This would not only put a ceiling on the number of nuclear weapons India could make, but also restrict the supply of tritium, produced as a process by-product from heavy water reactors. This, it is feared, would affect the size and quality of boosted nuclear and thermonuclear devices, thus, restraining the nature of the arsenal. Some have even opined that the Indo-US alliance "is aimed, on the one hand, at using India for American power projection in Asia, and, on the other, in taming Indian strategic, or dovetailing of its strategic, instincts to the larger imperatives of the alliance."[32]

31. Karnad, n. 24.
32. Varadarajan, n.25, pp. 18-19.

Such assumptions, however, are misplaced. The prime minister has reiterated that the agreement would not have any adverse impact on the country's strategic programme. It is no less significant that US Undersecretary of State Nicholas Burns has clarified that "... India could build reactors that would service their nuclear weapons industry." The designation of any reactor built in the future will be an Indian decision and India retains the right to add any additional military facilities that it considers necessary.

Even so, it must be highlighted that India's nuclear doctrine that was drafted well before such an agreement was anywhere on the horizon committed India to *minimum nuclear deterrence and no first use of nuclear weapons*. This obviates the need to stockpile large amounts of fissile material for arsenal building. The Indian deterrence presupposes the construction of a robust counter-strike capability that is survivable. It does not require India to indulge in a foolhardy exercise of warhead accumulation. In the Indian strategic perception, the nuclear weapon has a clear political, deterrent role and is not visualised as a war-fighting weapon. Therefore, the numbers required for deterrence are clearly very different from assessments of other states that have a first use doctrine. This essential difference must be kept in mind while assessing the impact of the Indo-US agreement on India's defence. Rather, by denying itself the opportunity to access international nuclear commerce for its energy security and economic growth, India would end up undermining its economic strength, that too is a deterrent of another kind. In an analysis of the pros and cons of the agreement, therefore, it is strategically more prudent to place some of the nuclear reactors under safeguards and firewall them from the strategic programme, than to subject the entire country to the risks of energy vulnerability and possible economic stagnation.

US CONCERNS

Impact on NPT and Non-Proliferation

In the US, the proposed cooperation agreement has been most opposed by the non-proliferation lobby that perceives the deal as having "potentially adverse

implications for US nuclear non-proliferation objectives."[33] Many of these fears were expressed in Congressional hearings held through November-December 2005. More recently, one non-proliferation expert said dramatically, "If the deal stands, the NPT will fall."[34]

These fears range over a variety of issues. One of these is that India might use material/equipment, thus, received for its weapons programme. This is based on the perception that the peaceful nuclear explosion (PNE) of 1974 had used plutonium and heavy water from plants supplied by Canada and the US. Secondly, they believe that imported nuclear fuel would free up India's limited uranium reserves for weapons, allowing India to substantially increase its weapon production. Thirdly, the exceptionalisation of India for nuclear cooperation, it is feared would threaten the foundation of the nuclear Non-Proliferation Treaty (NPT), and trigger fissures in the non-proliferation regime

Such assumptions are misplaced. First of all, even going by past experience, in conducting the PNE, India did not violate any legal commitment. In fact, in the early 1970s, the US and USSR, as also the IAEA supported research and development of PNE programmes for putting out oil well fires, stimulating oil and gas release from some types of geological formations, and for large scale civil engineering excavations of dams and canals. The Indian explosion was also conducted for similar purposes.

Secondly, the agreement in question provides India access to *safeguarded* nuclear energy. It is not about India's military nuclear programme, in which case too, India has already committed to a doctrine of minimum nuclear deterrence, a moratorium on nuclear testing and to working with the US to conclude the Fissile Material Cut-off Treaty (FMCT). Given that nuclear energy has an intrinsically military dimension, non-proliferation issues impinge upon the cooperation. However, it would be not only inaccurate but also counter-productive to view the nuclear relationship within the narrow framework of

33. These fears were most articulately expressed in the "Experts Letter" of November 18, 2005. Signed by a group of 16 bipartisan American proliferation experts and former government officials, this letter was addressed to the US House of Representatives, directing them to particularly examine issues pertaining to the possibility of proliferation as a result of the Indo-US civilian nuclear cooperation. Jasjit Singh and Manpreet Sethi provide a counterpoint to the concerns expressed in the letter in CSIS (New Delhi) *Issue Brief* # 1, December 2005.
34. Joseph Cirincione, "The US' Nuclear Cave in," *Asia Times Online*, March 4, 2006.

non-proliferation. There is a significant socio-politico-environmental dimension of the Indo-US relationship, in general, and civil nuclear cooperation in particular. Missing this crucial point leads to the misrepresentation of the agreement whereby India commits to subjecting many of its existing and planned civilian nuclear facilities to safeguards. This restrains India's ability to access all of its PHWRs for the strategic programme.

It is also significant that India has taken obligations beyond those required by the Nuclear Suppliers Group (NSG) in accepting that it would "refrain from transfer of enrichment and reprocessing technologies to states that do not have them and support international efforts to limit their spread." Such an agreement lays the basis of a new global consensus on non-proliferation through the worldwide adoption of more rigorous standards of export controls. India has already implemented this through the legislation of a comprehensive WMD Export Control Act and harmonisation of its export control lists with those of the NSG and the Missile Technnology Control Regime (MTCR). These steps demonstrate India's willingness to be part of the new, more effective non-proliferation order.

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Therefore, it is completely unjustifiable to believe that the agreement harms non-proliferation. The agreement brings under safeguards a programme that is well developed, and that had hitherto remained outside the regime. As Burns said, "We have now achieved a degree of transparency and oversight and impact on the Indian nuclear programme that was not possible for three decades."[35] By bringing India into the "rule-based system,"[36] the agreement reinforces faith in IAEA safeguards, leads to their "universalisation,"[37] and commits India to export

35. "India Can Build FBRs: Burns," *The Hindu*, March 3, 2006.
36. George Perkovich, "Faulty Promises: The US-India Nuclear Deal," *Policy Outlook*, Carnegie Endowment, September 2005.
37. IAEA director general's statement on March 3, 2006, immediately after the details of the separation plan were disclosed during the visit of President Bush to India.

controls consonance. It makes India accountable to international standards. And, as India's past record amply illustrates, New Delhi does not take its international commitments lightly.

In the light of the above, how can having India, a country with a significant nuclear capability and a safe nuclear non-proliferation record, on the side of the US, be adverse for US strategic interests or non-proliferation objectives? India has always upheld the cause of non-proliferation even when outside the regime, and has displayed more conformity with the letter and spirit of the NPT than many of its members. India has not indulged in any nuclear weapons, material or technology transfers. The same cannot be said, however, for either the NWS such as the US and China, or some non-nuclear weapon states (NNWS). As it is, the performance of the NPT does not evoke much enthusiasm or confidence to effectively constrain the nuclear weapons ambitions of those that are determined. Therefore, what threatens the NPT is an implosion from within, instigated by those that are either cheating on their obligations as NNWS or the frustrations of those NNWS that see no future for Article VI of the NPT.

Another misplaced assumption is that this agreement will promote proliferation by making others reduce their investment in non-proliferation.[38] Others will assess their investment in their voluntarily accepted non-proliferation commitments on the basis of their national interest. In fact, it is telling that none of the countries such as Argentina, Brazil, or South Korea has raised any objections against the proposed civilian nuclear cooperation. Interestingly, in fact, some suggest this to be the result of their dissatisfaction between the rich and the poor or the technological haves and have nots, so that the developing countries empathise with the Indian position and support its need to receive advanced technology! [39]

National interest and threat perceptions dictate the acquisition or abandonment of nuclear weapon programmes. It is illustrative that India, despite being outside the non-proliferation regime, supported its principles,

38. Some analysts like Sverre Lodgaard have mentioned that Algeria, Argentina, Brazil, Japan, South Africa and South Korea agreed to enter the NPT on the understanding that the number of NWS would not increase beyond the original five.
39. Ibid.

even as NPT member states like North Korea, Iran, and even South Korea have harboured nuclear ambitions despite being lawfully bound to shun nuclear weapons. Therefore, it is important to see the larger picture. IAEA Director General El Baradei, in his acceptance speech at the 2005 Nobel Peace Prize ceremony, said, "Feelings of insecurity and humiliation, exaggerated by today's nuclear imbalance, are behind the spread of bomb-development programmes at the national level."[40] This includes the fact that nuclear weapons presently enjoy a high salience even as commitment to eventual elimination of nuclear weapons is at its lowest. Therefore, threats to the NPT and the non-proliferation order stem from a number of realities that exist independent of the Indo-US nuclear cooperation agreement.

This aspect would be even clearer if one was to assess how the present day proliferation challenges would look if there was no Indo-US civilian nuclear cooperation agreement. Would the threat of proliferation from Iran or North Korea disappear, or even have a better chance of being resolved? Would it lead to a guarantee against illegal proliferation between China and Pakistan? Would it guarantee an end to the illegal nuclear commerce network? The answer to none of the above questions can be in the affirmative. These are challenges of proliferation that exist independent of the Indo-US agreement. If anything, bringing India into the non-proliferation regime would yield definite non-proliferation benefits by way of extending safeguards on an expanding nuclear programme, insisting upon India to further tighten its export controls and providing symbolic incentives to other countries for maintaining a clean proliferation record.

CONCLUSION

India and the US today find themselves at a distinctive historical juncture where their interests converge on several issues such as the fight against terrorism, advancement of economic development to spread peace through prosperity, energy security, non-proliferation, etc. The mutuality of interests has laid the foundation for a new relationship that exhibits the capacity to be sensitive to the

40. IAEA website, December 12, 2005.

other's needs and concerns. The possibility of cooperation in civilian nuclear energy is illustrative of this. If this matures, it has the potential to raise the mutual political and strategic interaction to a new level. In fact, the implementation of the civilian nuclear cooperation agreement would not only be an important milestone in Indo-US bilateral relations, but would also impact wider issues of energy security, global environmental sustainability and international security. Furthermore, it would help the international community to place a value on the full and consistent application of the highest standards for securing nuclear materials and knowhow, control of sensitive exports, protection of health and environment around nuclear facilities, and their safe operation.

Implementation of the civilian nuclear cooperation agreement would not only be an important milestone in Indo-US bilateral relations, but would also impact wider issues of energy security, global environmental sustainability and international security.

It would also break the stalemate on the problem of accommodating India as a state with nuclear weapons in the wider non-proliferation order even as it remains unacceptable under the NPT. India is a rising power and a country that the world has to engage with. But with an unaccommodating NPT standing in the way of constructive engagement, the US-India agreement opens a way to bring India into the non-proliferation regime and have it commit itself to universally applied non-proliferation standards.

In doing so, both sides have had to strike compromises, but it would be erroneous to dub these as affecting the national interests of both, or the larger interests of the global non-proliferation community. The reorientation of American nuclear policy to make it more relevant to present realities and threat perceptions is not a "reward" to India. Similarly, by accepting safeguards on a hitherto independent nuclear programme, India is not in danger of a "sell-out". As a mature nation with advanced nuclear technology, India is undertaking a pragmatic bargain that shall reinforce its economic strength, without unduly affecting its strategic

capability even as it commits itself as a responsible nation of the international community. And, surely having an economically stable, politically democratic, environmentally responsible, and proliferation-wise sound India is in the larger interest of the US, the Asian region and the world.

THE WAY AHEAD

For its being able to take the logical next steps to its successful implementation, the Indo-US nuclear relationship needs to be underpinned in the recognition of four realities on either side. For the US, these realities about India are:

(a) India *needs a nuclear programme* for the sake of its economic development and environmental sustainability.

(b) India has a nuclear weapons programme that will stay as long as similar programmes in other countries continue. Therefore, the US cannot expect to gain 100 per cent control over India's nuclear programme. India will preserve part of its nuclear facilities to service its weapons programme.

India's non-proliferation credentials are strong, notwithstanding the unsubstantiated, and possibly motivated, accusations of some non-proliferation experts.

(c) India's civilian and strategic nuclear programmes will continue irrespective of the fate of the cooperation agreement. In any case, the deal has no implication for the military programme. But even in the absence of the Indo-US nuclear cooperation agreement, India has the capability and the will to continue the programme, though the pace might become slower. Therefore, refusal of cooperation will have little impact on India's nuclear plans, though it will have a definite impact on Indo-US relations.

(d) India's non-proliferation credentials are strong, notwithstanding the unsubstantiated, and possibly motivated, accusations of some non-proliferation experts. In fact, India's record of non-proliferation enforcement is better than even that of the members of the NPT who have formally and voluntarily taken a non-proliferation commitment upon themselves. One need only recall that US, German, Canadian and European

technologies were exported through the 1970s and 1980s to many so-called threshold states. Pakistan was a notable beneficiary of these policies when the US ignored the transfer of Chinese nuclear designs and devices to Islamabad, including a design for a 25-kiloton nuclear warhead and open test data to it in the mid-1980s.

For India, the realities to be understood about the US are:

(a) The US has non-proliferation laws that necessitate India to take some steps to become eligible for cooperation. The separation plan must be accepted in this spirit.

(b) The US non-proliferation lobby exerts a fair amount of influence on the Congress. Therefore, the legislature will reverberate with concerns about how this deal will impact other states' approach to non-proliferation.

(c) US non-proliferation and commercial interests are often in conflict and the latter are known to have prevailed over the former. For instance, in the case of US-China nuclear cooperation agreement, in 1997, President Clinton did not issue certification for proceeding with the agreement signed way back in 1985, citing concerns about contacts between Chinese and Pakistani/Iranian entities. Nevertheless, the White House still announced, "subject to case by case licensing and ongoing US monitoring, the President will take action to enable US companies to compete in China's nuclear power market."[41]

(d) The Indo-US civilian nuclear cooperation agreement is essentially a top-down initiative and the present US Administration has a stake in it, more than a future one might have. So, India must make the most of this window of opportunity.

An understanding of these basic realities by both sides and attempts to reconcile these could help to show the way forward. For instance, the fact that India has a strategic programme should make the US realise the limits of safeguards that can be accepted by India, just as India's non-proliferation record should reduce American anxieties about any likely proliferation from India. Similarly, India should understand that the US has non-proliferation laws that require India to take some steps by way of separation of its nuclear facilities in order to reassure the US and others that aid for India's civil programme would

41. For more on US-China nuclear cooperation, see CRS Report for Congress, January 2006.

not amount to aid for the other strategic programme. But the fact that US non-proliferation concerns have often been sacrificed for commercial gains should make India showcase the attractiveness of its nuclear market.

The proposed cooperation agreement is now with the US Congress where it is being subjected to intense scrutiny and debate as different viewpoints are artfully lobbied. While this process is on, India could undertake the following measures to clear misperceptions and alleviate concerns, mostly of the non-proliferation lobby in the US.

1. Highlight the need for nuclear energy in India's energy mix given the country's economic growth prospects and the governmental commitment to provide power for all by the next decade.
2. Emphasise that how India meets this demand has implications not just for its own energy security but also that of the world. Reduced dependence on hydrocarbons would release pressure on this energy source, as also reduce the geo-political importance of a politically unstable region.
3. Emphasise that India's ability to meet this demand from a clean carbon source would help the cause of global environmental sustainability.
4. Highlight the commercial gains for the US nuclear industry from the Indian nuclear expansion.
5. Disabuse the non-proliferationists of the impression that the agreement is rewarding India for little in return. India's acceptance of international safeguards on indigenously developed, fuelled and operated nuclear facilities is a significant concession.
6. Highlight India's strong non-proliferation credentials and its responsible custodianship of its nuclear assets.
7. Explain the Indian position on nuclear weapons, and that it considers them as a political tool meant only for deterrence. The Indian nuclear doctrine accepts minimum nuclear deterrence and no first use, thus, obviating the case for a runaway vertical proliferation.
8. Counter the assumption that making this exception for India would make other countries reconsider their commitment to the NPT. A clear distinction has to be made of the case of India vis-à-vis three types of other states:

(a) Iran and North Korea: As NPT NNWS, their status, commitments and obligations are completely different from those of India.

(b) Pakistan: Its history as an ingenious proliferator is now well documented and the A.Q. Khan engineered network is believed to be still functional despite the removal of the leader.

(c) South Africa, Argentina and Brazil: It would be wrong to assume that they would want to acquire nuclear weapons because of India's entry into global nuclear commerce. They gave up their nuclear option because they thought it in their security interest to do so. They would reconsider on the same grounds and while the acceptance of India's nuclear reality does not alter their threat perceptions, the unhappy state of the NPT could.