



## India, ENR and NSG

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## *Summary*

Recently the Nuclear Suppliers Group amended their guidelines on transfers of enrichment and reprocessing (ENR) technologies. These changes have caused some concern in India. This Brief analyses the impact of these changes on India's civil nuclear programme and concludes that these changes should have no impact on it. It also concludes that unless the NSG is willing to modify its guidelines to allow ENR transfers to India, India should not seek admission to NSG membership even if offered.

The public statement of the Nuclear Suppliers Group (NSG) on June 24, 2011, after the conclusion of the 21<sup>st</sup> Plenary meeting of the group, stated that “The NSG agreed to strengthen its guidelines on the transfer of sensitive enrichment and reprocessing technologies;” without elaborating the changes to the guidelines. However, it is commonly understood that one of the major substantive changes, of concern to India, to the guidelines was the condition that suppliers should not authorise the transfer of enrichment and reprocessing facilities, and equipment and technology, if the recipient is not a party to the Non-Proliferation Treaty (NPT) and is in full compliance with its obligations under the treaty. The changes to the NSG guidelines have caused some concern in India since India is not a member of the NPT and hence under the new NSG guidelines not eligible for ENR (enrichment and reprocessing) transfers from the NSG members. In what manner and how seriously do these changes affect the Indian nuclear programme?

### Enrichment and Reprocessing Technologies

The enrichment and reprocessing facilities in India are all built on indigenous technology. The facilities are usually kept out of the International Atomic Energy Agency (IAEA) safeguards except, when they contain safeguarded material as in the case of some of the reprocessing facilities. If the current Indian technologies in both these areas are in line with the best contemporary practice, then there is no need for India to import facilities or technology and the changes to the guidelines should have very little practical impact on the Indian civil nuclear programme. What if the Indian level of expertise in one or more of these areas is not up to the best international standard?

The Indian indigenous civilian nuclear power programme has been planned in three stages with the first stage being based on the Pressurised Heavy Water Reactors (PHWR) run on natural uranium, the second stage being the Fast Breeder programme running on plutonium obtained from reprocessing of the spent fuels from both PHWRs and Light Water Reactors (LWR) and the third stage being advanced reactors based on thorium fuel. The only need for enrichment of uranium arises from the need to obtain highly enriched uranium (HEU) for India’s nuclear submarine programme. The imported LWRs will be covered by the accompanying fuel supply agreements making it unnecessary for India to enrich uranium for its LWR programme. And since India’s natural uranium reserves are low, there is little or no possibility of India entering commercial enrichment facilities. Such a programme would require (i) massive capital, modern enrichment facilities being capital intensive, (ii) enrichment technology, since the Indian enrichment technology has a long way to go before attaining the productivity levels of the TC21 and AC100 centrifuge machines; and (iii) need to import massive quantities of natural uranium. Therefore, without either the natural resource i.e. uranium or up to date enrichment technology, it is unlikely that India will need to import either enrichment technology or facilities. Therefore, for all practical purposes, the changes to the NSG guidelines will have very little impact on the Indian civil nuclear programme in so far as enrichment activities are concerned.

The matter is slightly more complex in the case of reprocessing technology. India already operates three reprocessing facilities. The total capacities of these plants have so far been sufficient to satisfy the current needs of reprocessed fuel. However, as the civil nuclear power sector expands with the import of LWRs, expansion of the PHWR programme and the introduction of FBRs (Fast Breeder Reactor), there will be a need to increase substantially the reprocessing capabilities in India. The size of these plants will have to be in range of hundreds of MT rather than the current size of 100 MT/year. If the state of Indian reprocessing technology is not at par with the best international practice, then for an economic running of the FBRs, India will need to import the best reprocessing facilities and technology. In such a case, the new restrictions imposed on transfers of reprocessing technology by the NSG will work against Indian interests and will definitely have an impact on the Indian civil nuclear programme.

In conclusion, there is no great urgency or need for India to have transfers of enrichment technology from abroad. However, if the state of Indian reprocessing technology is below the best international practice, then an efficient and economical Indian civil nuclear programme would benefit from imports of reprocessing technology and facilities.

However, do the changes to the NSG guidelines really make any difference on ground as far transfers of ENR technologies to India are concerned?

In June 2009, the G-8 countries issued the L'Aquila Statement on Non-Proliferation which stated inter-alia that "To reduce the proliferation risks associated with the spread of enrichment and reprocessing facilities, equipment and technology, we welcome the progress that continues to be made by the Nuclear Suppliers Group (NSG) on mechanisms to strengthen controls on transfers of such enrichment and reprocessing items and technology. While noting that the NSG has not yet reached consensus on this issue, we agree that the NSG discussions have yielded useful and constructive proposals contained in the NSG's "clean text" developed at the November 20, 2008 Consultative Group meeting.

**Pending completion of work in the NSG, we agree to implement this text on a national basis in the next year."**

In their last summit meeting at Deauville, the G-8 leaders reaffirmed their commitment to the 2008 NSG text and stated, "We welcome the work of the NSG to control the transfer of goods and technologies linked to the most sensitive aspects of the nuclear fuel cycle (enrichment and reprocessing). We encourage the NSG to quickly reach consensus in order to implement a strengthened mechanism supervising these transfers. While awaiting the completion of this work, **we agree to continue to apply on a national basis** the set of relevant export criteria indicated in the declaration adopted at the L'Aquila Summit and re-endorsed in Muskoka in 2010." The G-8 member countries, which include the European Union, have already implemented these changes in their domestic laws. The Russian Government, for example, passed a resolution N 992 on December 9, 2009 which, allowed export of isotope uranium enrichment plant, chemical processing of irradiated nuclear

fuel as well as relating to such installation of equipment and technologies to any State not a nuclear weapon state only if that state is a party to the NPT. The resolution has been periodically reissued every year.

Regarding enrichment technology and facilities, currently there are 13 countries that have centrifuge enrichment plants operating within them. Of these 13 countries, only eight namely, China, France, Germany, Japan, Netherlands, Russia, UK and USA have commercially viable large scale plants. The other five have small scale plants of vintage centrifuge technology. All the eight countries that have large scale plants are members of the NSG with seven of them being members of the G-8 as well. The only exception is China which is not a member of the G-8. Of the five that operate small scale centrifuge plants namely, Brazil, India, Iran, DPRK and Pakistan, Brazil is a member of the NSG. Of the remaining four, only Iran is a member of the NPT.

Thus, with the G-8 already enforcing NPT membership as a criterion for transfer of enrichment technology, the only potential suppliers of such technology to India are Brazil, China, Iran, DPRK and Pakistan. With the exception of China all others operate small size plants. Thus, the latest NSG amendment to its guidelines only affected transfers from Brazil and China. It is hardly likely that India would source enrichment technology from either Brazil or China. Hence, the new NSG guidelines on enrichment transfer are of little consequence to India, especially when India has little or no need to import such technology.

What about reprocessing technology and facilities? As discussed earlier, India may require importing reprocessing facilities or technology. Although a large number of countries have, or had operated in the past, reprocessing facilities, currently only eight countries namely, China, France, India, DPRK, Pakistan, Japan, UK and Russia have operating facilities. Of these eight countries four – France, Japan, UK and Russia - are members of G8 and are, therefore, already enforcing NPT membership as criteria for transfer of reprocessing facilities and technology. None of remaining four either operate any large scale commercial reprocessing plant, of the size that would be needed by India in future or have any technology superior to that already possessed by India. Hence, the recent NSG changes to its guidelines will have no practical impact on India's access to globally competitive reprocessing technology.

It is also not correct to state that the 2008 amendment to the NSG guidelines exempting India gave a blanket assurance to India that India will have automatic access to ENR technologies. The September 2008 NSG decision was only in respect of paragraphs 4(a), 4(b) and 4(c) of the guidelines - those relating to IAEA full scope safeguards requirements - and had no assurance whatsoever on access to ENR technologies, unless, of course, there were some side letters exchanged between India and the NSG. There is no evidence that such letters were exchanged. Therefore, the Indian charges that the recent amendments have altered the terms of the September 2008 NSG amendment are groundless. In addition, it hardly behoves India to charge others with bad faith, when it enacted a nuclear liability

bill that was out of line with all international norms of nuclear liability laws in operation in all other countries. Indeed, because of this nuclear liability law, India has not been able to sign any commercial contract with any of the international nuclear facility suppliers even though it has signed a number of country-to-country nuclear cooperation agreements - even with Russia which had been a strong supporter of India in the past by providing India with nuclear fuel for Tarapur in the face of opposition by other NSG members.

There is another important aspect that also needs to be analysed in respect of ENR transfers to India. According to the Agreement of the understandings between India and the United States of America expressed in the India-US Joint Statement of July 18, 2005, India agreed to:

- identify and separate its civilian and military nuclear facilities and programmes in a phased manner;
- file with the Agency a declaration regarding its civilian nuclear facilities (hereinafter referred to as “the Declaration”); and
- take a decision to place voluntarily its civilian nuclear facilities under Agency safeguards.

*The separation of the civilian and military facilities was entirely at India's discretion* and India and Indian analysts have been extremely zealous in asserting this right. Under these circumstances it would have been difficult for an NPT member to provide India with any ENR technology even if allowed to do so under NSG guidelines. The NPT members are prohibited from assisting any NPT NNWS in any nuclear weapon related activities. India is an NPT NNWS which has strategic nuclear programmes. If India is transferred ENR technologies, there is no guarantee that India cannot or may not replicate such facilities for its strategic programme and exercise its prerogative under the US-India agreement to claim that such replicated facilities are military in nature and not subject to safeguards. India has shown its technical capabilities in nuclear science and technology by replicating - successfully and on a large scale - the PHWR technology that it originally acquired from Canada. In fact, India is the only country that has imported nuclear technology and facility and successfully kept the replicated facilities out of any IAEA safeguards. No other country has been able achieve such success with its civil nuclear programmes through replication of transferred technologies. In any case, in respect of other NNWS either they were members of NPT and hence were required to keep all of their nuclear facilities under safeguards or were not technically competent, as in the case of Pakistan, to replicate technology even if it was possible for them to do so.

The IAEA, in fact, modified the text of its safeguards agreement to guard against such an eventuality only after India embarked on a programme of replicating the PHWR technology. Earlier, the safeguards agreement, such as the one negotiated between India and the IAEA in 1974 in respect of the Rajasthan Atomic Power Station (RAPS), required

that “The Government of India agrees that the nuclear material used or produced in the Rajasthan Atomic Power Station will be used only for peaceful purposes” i.e. only in respect of the transferred facility. However after India’s programme of replicating RAPS, the IAEA modified its safeguards agreement to require that “None of the following items shall be used for the manufacture of any nuclear weapon or to further any other military purpose or for the manufacture of any other nuclear explosive device:

- (1) Nuclear material or any nuclear facility transferred from one of the said States to the other;
- (2) Any nuclear facility which is designed, constructed or operated in one of the said States on the basis of or by the use of relevant technological information transferred from the other.”

In order to enforce the above requirements the safeguards agreement also included a paragraph that stated “Any nuclear facility or specified equipment which is designed, constructed or operated on the basis of or by the use of relevant technological information transferred from one State to the other shall be notified to the Agency by the contracting Government of the State to which the relevant technological information had been transferred. The contracting Government of the State from which the relevant technological information had been transferred is under the obligation to consult promptly the other contracting Government if in the view of the former there is reason for a notification to the Agency under this paragraph. The contracting Governments shall jointly or severally inform the Agency promptly if any disagreement should arise between them as to whether a particular nuclear facility or specified equipment should be notified to the Agency in accordance with this paragraph.”

Therefore, a transfer of ENR technology to India under the current environment can be made only if India agrees to such conditions i.e. allow for an examination by IAEA or mutually agreed experts to decide whether or not any similar ENR facility constructed by India subsequent to an ENR transfer is or is not based on the transferred technology i.e. whether or not the constructed facility should or should not be covered by IAEA safeguards. If India should consider such a condition a violation of its freedom to separate the civilian and military facilities and not agreeable to it, then transfers of ENR technologies to India may not be possible even if NSG does not bar ENR transfers.

**Hence for all practical purposes the recent NSG changes should not have any appreciable impact on India’s civil nuclear programme and should not be a matter of concern from that angle. However, that does not mean that India should not be concerned by the recent NSG actions.**

At the time of the September 2008 NSG exemption to India from the NSG guidelines requiring full scope safeguards for nuclear transfer, the NSG also agreed that “In order to facilitate India’s adherence to INFCIRC/254/Parts 1 and 2 and to remain current in its



implementation of the Guidelines, the *NSG chair is requested to consult with India regarding changes to and implementation of the Guidelines and inform the Plenary of the outcomes of the dialogue with India. Consultations with India regarding proposed amendments will facilitate their effective implementation by India.*" (Para 4, INFCIRC/734 (Corrected)). It is not at all certain whether the NSG followed this procedure or took into account India's legitimate concerns. Under the circumstances it may not be out of place to suggest or assume that the NSG changes were directed primarily against India.

So what should India do now?

Currently, NSG is considering on how to accommodate India as an NSG member. As NPT membership is also a criterion for admittance of new members to NSG, the NSG will, therefore, have to craft a language that will allow India to circumvent this requirement. If the NSG is willing to grandfather this language in respect of ENR transfers as well then India may not have any problem with the revised NSG guidelines. **If, however, the NSG is unwilling to consider such a move then India may reconsider its approach to the issue of NSG membership and decline NSG's offer of NSG membership. Why?**

Under the current environment, neither India nor the NSG stand to gain or lose much if India is not a member of the NSG. To recapitulate the reasons for such a conclusion:

- i) India has already got an NSG exemption allowing for NSG members to trade in civil nuclear commerce with India without fulfilling the requirement of IAEA full scope safeguards;
- ii) India has formally declared its adherence to the NSG guidelines;
- iii) India has a robust export control system in place;

Therefore, NSG membership does not confer, at this moment, any additional benefits to India with the NSG exemption already in place. The NSG also does not get, at this moment, any additional benefits to its non-proliferation goals from India's membership as India is already committed to adhering to the NSG guidelines.

In the long run too, India does not gain much from NSG membership except for the fact that India will have a voice in future amendments to the guidelines. But, the only amendment to the NSG guidelines that would be of concern to India would perhaps be an amendment rescinding the 2008 NSG amendment. However, for the NSG members concerned about the evolution of future non-proliferation norms, Indian membership in the NSG would be crucial.

India has a vibrant and growing nuclear sector in all its aspects: research and development, technology development and nuclear industry which is extremely cost competitive with the rest of the world. In future, countries interested in nuclear industry are likely to look to India as a source of technology and equipment including dual-use items as they develop

their nuclear capabilities. It is not unlikely that one or more of the current NSG members would refuse them such technology and equipment. In such cases they are more likely to look towards India for fulfilling their industrial needs. The NSG members do share license information during their annual plenary and routinely exchange information on license denials. It is extremely unlikely that the NSG would be able to name specific countries or states as those being ineligible for nuclear transfers under their guidelines. Only the United Nations Security Council would be able to impose such sanctions. With no possibility of nuclear disarmament in the near and long term future, the UN would be unable to muster sufficient support for any ban on nuclear trade with a country except under dire circumstances. That being the case, a country refused a nuclear transfer license by an NSG member can approach any non-NSG member for technical and industrial assistance and India will be one of the few countries with the full range of nuclear activities that would be able assist such countries. Since India will not be member of the NSG, even if it agrees to adhere to NSG guidelines, there will be no bar on transfers from India to NPT members in good standing. It will make commercial sense as well for India to delink its nuclear commerce from that of the major NSG members who have been in the forefront of actions against India in the NSG.

**Therefore, India should refuse the offer of NSG membership even if it is offered to India in the absence of NPT membership so long as the NSG does not consider transfer of ENR technologies to India under proper safeguards as a legitimate requirement for the progress of Indian civilian nuclear programme.**