

Special report on the **Second Annual Meeting of the Nuclear Law Association**

**“India’s nuclear energy sector:
Business opportunities and
legal challenges”**

2 March 2013, Mumbai, India

Article from the
Nuclear Law Bulletin, No. 91

**Special report on the Second Annual Meeting
of the Nuclear Law Association**

**“India’s nuclear energy sector: Business opportunities
and legal challenges”**

2 March 2013, Mumbai, India

© OECD 2013

NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where the governments of 34 democracies work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Republic of Korea, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Commission takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the Organisation's statistics gathering and research on economic, social and environmental issues, as well as the conventions, guidelines and standards agreed by its members.

*This work is published on the responsibility of the OECD Secretary-General.
The opinions expressed and arguments employed herein do not necessarily reflect the official
views of the Organisation or of the governments of its member countries.*

NUCLEAR ENERGY AGENCY

The OECD Nuclear Energy Agency (NEA) was established on 1 February 1958. Current NEA membership consists of 31 countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, the Republic of Korea, the Russian Federation, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Commission also takes part in the work of the Agency.

The mission of the NEA is:

- to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes, as well as
- to provide authoritative assessments and to forge common understandings on key issues, as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

Specific areas of competence of the NEA include the safety and regulation of nuclear activities, radioactive waste management, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information.

The NEA Data Bank provides nuclear data and computer program services for participating countries. In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

Also available in French under the title:

Bulletin de droit nucléaire n° 91

LEGAL NOTICE

**The Organisation for Economic Co-operation and Development assumes
no liability concerning information published in this bulletin.**

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Corrigenda to OECD publications may be found online at: www.oecd.org/publishing/corrigenda.

© OECD 2013

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of the OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) contact@cfcopies.com.

Special report on the Second Annual Meeting of the Nuclear Law Association

“India’s nuclear energy sector: Business opportunities and legal challenges” 2 March 2013, Mumbai, India

Summary of the proceedings¹

The Second Annual Meeting of the Nuclear Law Association, India (NLA India) was held on 2 March 2013 in Mumbai. The theme of this year’s meeting was: “India’s Nuclear Energy Sector: Business Opportunities and Legal Challenges”.

Several of the papers presented will be published in the *Journal of Risk Research* in June/July 2013 as part of a special edition featuring proceedings from this Nuclear Law Association, India Second Annual Meeting.²

Inaugural session

Welcome address: Dr. M.P. Ram Mohan, Nuclear Law Association, India; and The Energy and Resources Institute (TERI)

Dr. Ram Mohan, Chairman of the Nuclear Law Association, India, and Fellow at TERI, set the stage with his welcome speech. A special announcement was made regarding the new “winter course” on nuclear law which will be offered by NLA India in co-operation with the National Law University of Delhi (NLUD), and will be held 18 to 22 November 2013, at the NLUD campus.

Presidential address: Ravi Kadam, Senior Counsel, Bombay High Court; and former Attorney General, Maharashtra

Mr. Ravi Kadam emphasised the necessity of a clear legal framework of nuclear law in India. He noted the important responsibility of the legal community with respect to clarifying the intricate and complex issues relevant to nuclear law and representing the interests of common people as well.

However, he stressed the need to strike a balance between competing interests, and referred to the fact that some of the public interest litigation (PIL) matters may not necessarily represent the interests of common people. Moreover, he noted that in Maharashtra alone a large number of infrastructure projects have not received the necessary approvals due to the PILs filed against the project. He observed that courts are not always well equipped to deal with a large number of PILs which are technical in nature and often based on the complex “precautionary principle” that imposes the burden of proof on the person proposing to undertake activities that may affect the environment. Groups of technical experts, or an active government regulator to whom certain matters could be referred or from which expert opinions could be obtained, would be of great assistance to the judiciary in its review of PILs.

-
1. These proceedings were prepared by Vivek Nemane, Academic Associate, Symbiosis Law School, Pune, India and Els Reynaers-Kini, Partner, MV Kini & Co. and Secretary, Nuclear Law Association, India. The proceedings of the Nuclear Law Association, India Second Annual Meeting are available at: www.nlain.org and <http://nuclearlaw.wordpress.com>.
 2. Additional information regarding the *Journal of Risk Research* is available at: www.tandfonline.com/loi/tjrr20.

Based on his own experience as the former Attorney General of Maharashtra, Mr. Kadam cited some of the reasons behind recent protests at the Jaitapur nuclear project site in Maharashtra, which are to a large extent based upon a lack of information and justification with respect to the positive impact of large-scale infrastructure or energy projects. He noted that there is a need for close interaction among experts, the public, the media and industry to address the concerns of the general public. In Mr. Kadam's words: "To address the concerns of common people is absolutely essential in this country in order to prevent the roadblocks in carrying out future nuclear projects."

Special address: Siddharth Varadarajan, Editor, The Hindu

As a journalist, Mr. Siddharth Varadarajan has tracked the evolution of the legal and political framework governing the development of nuclear energy projects in India. He noted that the development of the nuclear industry in India in recent years evolved alongside nuclear law in the country including:

- a) the Agreement Between the Government of India and the IAEA for the Application of Safeguards to Civilian Nuclear Facilities, which takes into account that India is not a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT);
- b) the bilateral agreement with the United States for co-operation concerning peaceful application of nuclear energy (also known as the "123 agreement");
- c) bilateral agreements for nuclear co-operation with various countries, including France and Russia;
- d) the 2008 Nuclear Suppliers Group (NSG) decision to grant India a waiver from its rules which forbid nuclear trade with a country that has not signed the NPT;
- e) export control regulations;
- f) Weapons of Mass Destruction (WMD) legislation;³
- g) The India-Pakistan Non-Attack Agreement which outlaws attacks against each other's civil nuclear facilities;
- h) the Civil Liability for Nuclear Damage Act, 2010 and its implementing rules;⁴ and
- i) draft nuclear safety regulation under consideration.

Mr. Varadarajan cautioned that a legal regime is only as good as the manner in which it is implemented. Specifically, he argued that the implementation of nuclear projects must be undertaken with widespread public confidence. Creating a conducive environment and gaining public acceptance for nuclear projects are important to the success of such projects. He believes that negative public perception has its greatest impact on the issue of land acquisition. He noted that peaceful protests are important and should be allowed because it is the right of the

3. Note from the editor: additional information regarding the legislation prohibiting unlawful activities in relation to weapons of mass destruction and their delivery systems is available at: www.iaea.org/Publications/Documents/Infcircs/2005/infcirc647.pdf.

4. Note from the editor: the Civil Liability for Nuclear Damage Act, No. 38 of 2010, 47 Gazette of India, pt. II, sec. 1, pp. 1-15 (New Delhi, 21 Sept. 2010) is reprinted in this edition of the *Nuclear Law Bulletin*. The Civil Liability for Nuclear Damage Rules, 2011, 2112 Gazette of India, pt. II, sec. 3, pp. 1-20 (New Delhi, 11 Nov. 2011) are available at: www.prsindia.org/billtrack/the-civil-liability-for-nuclear-damage-bill-2010-1042/ and were published in *Nuclear Law Bulletin*, No. 88, (2011/2), OECD, Paris, p. 163.

common people, and that protests must be handled cautiously. For instance, in his opinion, the sedition charges against some of the Kudankulam protesters were uncalled for.

He noted that implementation of the law in its letter and spirit is absolutely essential because the law is a torchbearer for industry, business, and society at large. He stated that an open-minded approach toward various stakeholders would be advisable to enable the smooth evolution and implementation of nuclear law and policy.

Mr. Varadarajan indicated that the extensive negotiations during the preparatory and drafting phases of the nuclear liability law actually strengthened its outcome. He stated that against the backdrop of the recent judicial decision on the Bhopal accident and international developments including the Fukushima Daiichi accident and the British Petroleum oil spill in the waters off the United States, a strong domestic law was enacted with consistent support from all stakeholders. "The technological and legal doors for the development of nuclear energy are open now, but further progress will depend upon policies being implemented in an enlightened way" concluded Mr. Varadarajan.

Keynote address: Dr. R.B. Grover, Homi Bhabha Chair and Director, Homi Bhabha National Institute

Dr. R. B. Grover provided a detailed background on the nuclear energy development in India, a country where developing sources of electricity generation is a pressing need. Dr. Grover offered a comparison between the availability of energy resources versus various needs to be fulfilled on the basis of currently available resources. For instance, coal is still abundant currently but India's domestic reserves are expected to be depleted within five decades; solar energy and wind energy as renewable resources are equally important to meeting the overall energy demand. He noted that nuclear energy is a significant option to be pursued in India, as it is well tested and affordable. He stated that the government of India is committed to the growth of nuclear energy to provide energy security in a manner that is environmentally sustainable.

He pointed out that following the accident at the TEPCO Fukushima Daiichi nuclear power plant, countries around the world took precautionary steps towards the safety of nuclear power plants. In this regard, India was not an exception. Post-Fukushima, the Nuclear Safety Regulatory Authority Bill, 2011, was introduced in the Parliament of India to establish a national framework for the governance of nuclear power generation.

Dr. Grover also touched upon the options and needs for the growth of nuclear electricity generation in India. India's aggressive pursuit of additional uranium resources in the country over the last decade is now showing results. India has also undertaken policy initiatives to engage in international trade in uranium including through:

- a) importing uranium to build additional pressurised heavy water reactors (PHWRs) based on indigenous technology;
- b) importing uranium to build light water reactors (LWRs) in technical collaboration with other countries; and
- c) establishing a dedicated reprocessing facility under IAEA safeguards for the development of an indigenous fast breeder reactor (FBR) programme.

Dr. Grover stated that the NSG waiver enabled India to import more uranium, thereby increasing the capacity of nuclear power plants. He further offered an overview of the likely capacity additions and new power plant projects projected under the XIIth Five Year Plan (2012-2017).⁵

Dr. Grover submitted that countries rely upon different models of government and private sector participation in the development of nuclear projects. He noted that some models are inclined toward the primacy of government, whereas others toward the primacy of the private sector. In his opinion, the Indian model of public/private participation is still evolving, however, he believes it is important to establish the basic comprehensive framework for nuclear energy before allowing private sector participation.

Reflecting on the specific themes of the Second Annual Meeting, Dr. Grover acknowledged that it would be essential to ensure that whatever is being done is safe from a technical point of view vis-à-vis the public. While stressing the importance of the engagement with the public, Dr. Grover also stated that there would be a need for a constructive debate with all stakeholders. He noted that from the government's perspective one could consider involving skilled communicators (as opposed to merely technical experts) to convey some of the most important issues related to nuclear energy, project development and India's vision in this regard to the local population and the general public.

In response to a question regarding whether the government of India has a roadmap for private sector participation in the field of nuclear energy, Dr. Grover started by referring to the fact that the private sector is already engaged in the design, manufacture of equipment, and construction of nuclear power plants. He underlined that only the ownership and operation of nuclear power plants is not private. To the best of his knowledge, under the current policy and legal framework, the government of India has not planned such a roadmap. Moreover, he noted that it will be important to develop a more robust framework for the governance of nuclear power, including the adoption of the Nuclear Safety Regulatory Authority Bill, 2011, since without such a concrete framework, private sector participation would not be encouraged.

In response to a question whether the NSG waiver regarding India might imply that India could serve as an exporter and supplier of nuclear equipment and technologies to other countries and whether the Indian authorities have a plan in this regard, Dr. Grover indicated that India is already a supplier of nuclear equipment and technology. Licences to export are already given to a few companies and applications for such licences are increasing. Slowly, Indian companies will grow in this sector; no legal barriers to such trade exist today but commercial and political barriers do exist. For instance, India has significant experience with small modular reactors, which are now attracting attention abroad, but this attention has not resulted in a concrete proposal to export these reactors.

Panel Session 1: Nuclear Energy Projects & Private Sector Participation

- Chair: Bahram N. Vakil, AZB & Partners

Mr. Vakil raised the issue of how the private sector can optimise growth without the growth of the power sector. With a 4% increase in energy generation, he questioned how India can achieve a 7.8% increase in GDP growth. He noted that unlike other countries, India does not have the luxury of choice between various

5. India's economic planning is based on five-year plans developed and executed by the Planning Commission of India. See <http://planningcommission.gov.in/plans/planrel/index.php?state=planbody.htm>.

energy options and, therefore, would have to pursue thermal, renewable and nuclear power to maintain its GDP. He noted that France embarked on its nuclear programme in 1947, just like India; however, India generates 4380MW from its NPPs whereas France achieves 63000MW.

- Rajendra Shrivastav, Director India, Nuclear Business, Alstom India Limited

Mr. Shrivastav explained the intricate technological requirements of nuclear power projects, noting that in India, Alstom provides components which are used in the turbines of conventional islands in the power plant, not the nuclear reactors themselves. He noted that in India the nuclear power plants have evolved from the smaller 220MW to 540MW NPP models and now onwards to larger 700MW nuclear power plant designs. Given the significant investments made by suppliers and subcontractors in technologies in India – and that there is essentially only one buyer (the Nuclear Power Corporation of India Limited [NPCIL]) in the country - it is important to have a sense of continuity and a guaranteed market. In addition, considering the duration of the projects, a long-term and permanent partnership is expected from the NPCIL. Nuclear plants operate for an average of 60 years: a first phase of 40 years plus a possible extension. Thus, the suppliers and subcontractors are engaged in the process of providing technologies for the lifetime of the plant. Mr. Shrivastav stated, “our work is not over after selling the equipment”, given that there is a continuous project cycle for long-term operation. Such long-term association between suppliers, subcontractors and the NPCIL is expected to endure for several decades, necessarily entailing significant commitments for investments as well.

From a legal point of view, Mr. Shrivastav noted that it is important that suppliers and subcontractors obtain clarity on the breadth of certain legal provisions, so as to better assess their possible long-term impact. Moreover, technology providers such as Alstom are asked to agree to civil nuclear liability clauses in contractual provisions. He clarified that it is important to understand that it is not fair to ask the subcontractors to agree to civil nuclear liability clauses in contractual provisions and that subcontractors would not agree to assume such liabilities.

- Badrinath Durvasula, Vice President and Legal Head, Larsen & Toubro (L&T)

Mr. Durvasula showcased the industry-specific concerns that can be categorised as domestic and international.

Mr. Durvasula noted that under India’s domestic legal provisions (Sections 17 and 46 of the Civil Liability for Nuclear Damage Act, 2010), there are two important issues: the liability of the operator and the liability of the contractor.⁶ He stated that through contractual provisions on the right to recourse, an operator may subrogate its liability to a contractor/supplier. He stipulated that contractors can be typically divided into two groups, large and small. Large contractors, such as L&T, may be able to afford such liability recourse clauses with an operator, factoring risk into its overall project cost. However, smaller companies and subcontractors of primary contractors are often not willing to sign such liability recourse clauses, which may pose significant legal and financial challenges to smaller businesses.

Mr. Durvasula indicated that the problem of risk exposure is compounded by the fact that suitable insurance to cover liability risk is not available, neither from the

6. Editor’s note: for a discussion of India’s liability regime, see Gruendel, R. and E. Raynaers-Kini (2012), “Through the looking glass: placing India’s new civil liability regime for nuclear damage in context”, *Nuclear Law Bulletin*, No. 89, (2012/1), OECD/NEA, Paris, pp. 45-66.

General Insurance Corporation of India (GIC Re) nor from any of the Indian insurers, due to the lack of resource pooling arrangements. He believes that introducing such insurance coverage would enable the entire contractor community to bid for projects, thus making the bidding process more competitive. He believes that in the absence of suitable insurance coverage, the contractors that are willing to take calculated risks will factor the risk into their estimated project cost, which is detrimental to the contracting process.

Mr. Durvasula explained that L&T is engaged in several international nuclear projects including the International Thermonuclear Experimental Reactor (ITER) project in France, which is underway with 7 members: the European Union, India, the Russian Federation, the United States, Japan, the Republic of Korea and China. More specifically, he noted that L&T has undertaken the supply and installation of critical equipment for this unique fusion energy experiment located in Cadarache, France. He noted that for an Indian company it is paradoxical to note that French laws offer a greater degree of business comfort and legal clarity to suppliers than the nuclear liability legislation in India. He believes that it is, therefore, important that clarity and confidence is given to Indian contractors with respect to legal nuclear liability in India as well.

Mr. Durvasula explained that there is a lack of clarity on the liability exposure of the contractors with respect to the Kudankulam nuclear power plant units 1 and 2, to which the Civil Liability for Nuclear Damage Act and Rules may not apply due to the precedence of the provisions of the agreement signed by the Prime Minister of India and the President of the former Soviet Union on 20 November 1988 over the provisions of the Civil Liability for Nuclear Damage Act. Application of the provisions of the Civil Liability for Nuclear Damage Act to the Kudankulam nuclear power plant units 3 and 4 requires further examination as it is a confusing issue, particularly for contractors trying to assess their risk with respect to particular projects.

- Vyoma Jha, Associate Fellow, Centre for International Sustainable Development Law⁷

Ms. Jha discussed India's investment treaty commitments and obligations noting that the involvement of foreign corporations in building nuclear reactors in India increases the amount of foreign direct investment in nuclear energy and, as a result, increases the threat of foreign investor claims against domestic entities. She noted that investment treaties typically include provisions that grant special protections to investors from one state (home state) who invest in the territory of the other state (host state). She explained that one of the broad investor guarantees provided in these treaties gives private investors the right to sue countries directly before an international arbitral tribunal in the event of a breach of any treaty obligation. She indicated that this development is all the more relevant in light of the rapid increase in investor-state disputes over the last decade, coupled with the first known investment treaty arbitration outcome against the government of India⁸ and a spate of recent investor claims against India.

Ms. Jha stated that India is aiming to attract foreign direct investment of USD 100 billion in nuclear energy in the next 20 years. She highlighted the fact that in light of the various investment treaties India has signed with different countries, India is vulnerable to being sued by foreign investors in the nuclear energy sector. One such example that she focused on was with respect to Russia's request to waive

7. Vyoma Jha's paper on "International Investment Treaty Implications for the Indian Position on Nuclear Liability" will be published in the *Journal of Risk Research* in 2013 as noted above.

8. *White Industries Australia Limited v. Republic of India*, UNCITRAL, final award dated 30 November 2011.

the Civil Liability for Nuclear Damage Act, 2010 for the two Russian reactors being built at the Kudankulam nuclear power plant units 3 and 4. The Indian government has taken the position that the Kudankulam nuclear power plant reactors 1 and 2 are not covered by the Civil Liability for Nuclear Damage Act, 2010 as they are governed by an intergovernmental agreement with Russia that never envisaged a right of recourse against the Russian suppliers. The applicability of the Civil Liability for Nuclear Damage Act, 2010 to units 3 and 4 remains unsettled. Ms. Jha noted that Indian nuclear liability law is *sub judice* before the Supreme Court of India by way of a public interest litigation matter that seeks a writ declaring that all nuclear suppliers to the Kudankulam plants be covered by the Civil Liability for Nuclear Damage Act, 2010 irrespective of any agreement or undertaking.

Relying on the two investment treaty arbitrations involving Germany and the Swedish company Vattenfall that challenged host state regulatory discretion, Ms. Jha analysed whether a decision of the Supreme Court of India (or any subsequent policy decision by the government of India), which would affect the liability waiver to Russian suppliers, could have serious implications under international investment law. She noted, for instance, that a decision by the Supreme Court of India on the question of nuclear liability may raise potential investor claims on the grounds of a breach of “fair and equitable treatment”.

Ms. Jha concluded by highlighting that in its zealotry to increase foreign direct investment in the nuclear energy sector, India might be exposing itself to the threat of investor claims for the slightest inconsistencies between its regulatory actions and international investment commitments. In other words, policymakers in India need to be mindful of the possible implications of investment treaties on its domestic policy or regulatory action, even in the nuclear energy sector. Thus Ms. Jha suggested that the Indian government ought to ensure that future investment treaties with countries, which may be potential foreign investors in the nuclear energy sector, do not suffer from the same pitfalls as seen in the existing old-style Indian investment treaties.

- Amey Pathak, Partner, Amarchand & Mangaldas & Suresh A. Shroff & Co. (AMSS)

Mr. Pathak noted that financing is a key aspect of nuclear power projects due to the large amount of investment required. He explained that the primary sources of financing for such power projects are typically banks, export credit agencies (ECAs) and financial institutions. However, he stated that banks generally have a limited ability to fund these large-scale infrastructure projects.

He suggested that nuclear power projects face several challenges and risks, including the particularly sensitive issue of land acquisition. He explained that the Land Acquisition Bill with its “public purpose” provision proposes an amount of compensation which is 2 to 4 times the market value of the land. He noted that even requirements under environmental laws, such as clearance from the Ministry of Environment and Forests of the government of India, come with their own set of requirements and challenges. In addition, he reminded the audience that it is not uncommon to observe delays in the construction of nuclear power plants and that such delays result in cost overruns which affect the viability of the projects themselves. He explained that, generally speaking, the original capital cost of a nuclear power plant is approximately 8-10 Crore/megawatt, and that such a project is typically of 200-400 megawatt size, which results in a very high cost.

Mr. Pathak suggested that from an asset management perspective, Indian banks can provide loans having a start-to-finish tenure of 10-15 years. He noted that the first 4-5 years of a nuclear power plant project are dedicated to construction (during which time there is a moratorium on the repayment of loans) which leaves about 10 years for the repayment of loans, a time period that is usually too short for the

repayment of large loans. He suggested that if the amount of debt required for nuclear project funding is reduced to enable the debt to be repaid within a shorter period, the promoter entity, government entity or private sector entity assisting in the funding of the nuclear project must contribute a larger amount of capital. He noted that private sector funding is not permitted in this sector at this time, and that as a result, export credit agencies and multilateral lending agencies have become more important as they are able to provide loans of longer tenure. However, he stipulated that there are certain multilaterals which have policies not to fund nuclear power projects.

Mr. Pathak further observed that procurement risks should be taken into account, specifically since suppliers of equipment are very few and that every supplier has its own intellectual property rights. He explained that for this reason it may be difficult to find a substitute supplier, especially in a situation in which a supplier is in breach of contractual obligations or is being wound up. He felt that because suppliers are few in numbers, technical expertise is limited.

He also reviewed the fuel requirements for nuclear power plants, noting that the domestic availability of uranium is sufficient for operation of a 10 000 MW reactor and that fuel resources are governed by international treaties. He indicated that there is always a risk of a fuel supplier not supplying the fuel due to international treaty commitments, which is a significant risk, given that fuel is required on a constant basis for the life of a nuclear plant.

Following a comment made by one of the participants that the private sector is taking steps towards developing its capabilities with respect to technology, supply and design in the nuclear power sector, Mr. Pathak concluded that it would be worth looking at “global best practices” in this regard.

When asked whether bonds would be a good option to ensure capital availability, Mr. Pathak responded that the bond market in India needs to develop further. He explained that, typically, bonds are raised after the construction phase, and not during construction, as there is significant construction risk which bond holders may not be willing to assume.

Panel Session 2: Regulatory and Stakeholder Engagement in Nuclear Energy Projects

- Chair: Justice A.M. Thipsay, Judge, Bombay High Court

The Chair of the session stated that nuclear energy development requires robust laws and regulations that address all relevant aspects and concerns, and that such laws and regulations also ensure that there will be public participation and safety at all levels.

- Dr. S. S. Bajaj, Chairman, Atomic Energy Regulatory Board (AERB)

Dr. Bajaj began his presentation by stating that the regulation of safety stands at the centre of all the AERB’s activities. He traced the development of the nuclear sector in India and the establishment of the AERB in 1983 through the provisions of Atomic Energy Act, 1962. He noted that there has been an evolution from self-regulation in the 1950s to close safety supervision and consent by the AERB throughout the siting, construction, commissioning, operation and decommissioning phases of a nuclear power plant’s lifetime. He stated that while the licensee retains the prime responsibility for ensuring safety of a nuclear power plant, the AERB ensures that the licensee is performing its responsibilities adequately. Dr. Bajaj also provided an overview of the various AERB safety reviews and committees, which include external experts. Dr. Bajaj further elaborated upon the regulation of operating plants which involves regular reporting requirements, inspections and detailed safety reviews, and a periodic safety review every 10 years. He stated that this process entails a thorough safety assessment of the nuclear

power plant against current safety standards and practices, and that any shortfalls or non-compliance is analysed and upgrades are carried out, if necessary, ensuring constant safety.

Dr. Bajaj suggested that there are well-established safety principles, criteria and practices for design, operation and management of nuclear power plants. He explained that the designs incorporate defence-in-depth philosophy and safety design principles of multiple barriers, among other safety and security measures. He stated that the annual reports of the AERB, which are publicly available on its website, provide information at a very detailed level regarding the safety performance of all nuclear power plants in India.

Dr. Bajaj also stressed the fact that the AERB is independent of the Department of Atomic Energy (DAE). He explained that the AERB's reporting to the Atomic Energy Commission (AEC), a high-level policy making body, consists of the presentation of annual reports and budget proposals. He stressed the fact that the AERB has total autonomy in regulatory decision-making, and that its independence can be gauged by the large number of enforcement actions taken by the AERB. He emphasised that the AERB had ordered numerous safety improvements in design/operation, additional tests, analyses, and even stoppage of work or operation on previous occasions and noted that the recently tabled Nuclear Safety Regulatory Authority Bill proposes to further strengthen the independence of the nuclear regulator.

Given the importance of public involvement and the mixed experience thus far with public hearings as part of the environmental impact assessment procedure, Dr. Bajaj was also happy to announce that the AERB is finalising a new method to engage with the public in the early planning stages going forward, which will be implemented on a trial basis with the Haryana (Gorakhpur) siting process. In conclusion, Dr Bajaj stated that "public confidence is of absolute importance to the AERB."

▪ Shah Nawaz Ahmad, Senior Advisor, World Nuclear Association

Mr. Ahmad outlined the objectives and functions of the World Nuclear Association (WNA), a body that encompasses the entire range of nuclear power works and services and that remains the predominant industry voice in the international nuclear power arena with 200 members from around the world.

He explained that WNA members comprise the who's who of the nuclear world including uranium miners, transporters, technology providers, manufacturers, contractors, plant owners and operators, and lawyers and other service providers. He noted that the WNA has 16 working groups which deal with the detailed and technical aspects of the nuclear business, suggesting that from the point of view of this event, the most relevant WNA working groups are those related to nuclear law and contracting, co-operation in reactor design evaluation and licensing (CORDEL), supply chain, construction risk management and security of the international fuel cycle. He explained that these working groups address industry-related issues in the relevant technical areas and articulate them in appropriate fora and with the relevant organisations, particularly the IAEA.

Mr. Ahmad praised the AERB as a robust, safety-oriented board with great technical expertise. Moreover, he claimed that the AERB's ability to call upon designers, developers, operators and other specialists is a distinct advantage.

However, he reflected that post-Fukushima, people are not at all convinced that accidents will not take place. He suggested that theoretical figures about failure rates and assurances of being able to tackle beyond design basis events need to be supplemented through increased transparency and more robust confidence building measures. He concluded that a lot of assurance work needs to be done on this front.

Mr. Ahmad explained that the WNA focuses on the harmonisation of licensing and design, as there are many licensing models worldwide, observing that flexibility and adaptation to cultural variations is important. He suggested that working toward greater clarity regarding requirements and timelines for approvals as well as closer interaction between regulators and other involved agencies may be helpful as a way to address the challenge to build projects on time and within budget. He noted that documentation and compliance with legal and regulatory requirements are essential to a nuclear power plant project. For this reason, ensuring the coherence of documents with comprehensive international treaties or agreements is very important.

Through its CORDEL working group, WNA seeks to promote a world-wide regulatory and industry environment in which internationally accepted standardised reactor designs can be widely deployed without major design changes. Mr. Ahmad added that it is a misconception that standardisation means similar designs and that standardisation should be interpreted in the context of ensuring easy understanding and comparability of all designs. He suggested that better communication amongst the stakeholders is of vital importance to the success of standardisation. Mr. Ahmad concluded by stating that “patience, precise communication and documentation, and transparency are key requirements to move forward.”

▪ Mohit Abraham, Partner, PXV Law Partners

Mr. Abraham claimed that in the wake of the accident at the TEPCO Fukushima Daiichi nuclear power plant, public acceptance of nuclear power is of critical importance. He delineated two different phases in the history of nuclear power projects in India: a “secretive phase” and a “post-secretive or public phase”. He suggested that earlier projects such as Narora and Kalpakkam were undertaken in the secretive era. He stated that following the conclusion of the agreement between India and the United States on civil nuclear co-operation (also known as the “123 Agreement”) and the Nuclear Suppliers Group waiver on exports to India, as well as the accident at the Fukushima nuclear power plant, “nuclear” became a public issue in the sense that it received nationwide publicity. He is of the view that easy access to information (particularly via the Internet) has left both good and bad perceptions open to scrutiny. He claimed that concrete steps are required to tackle the transition from the secretive to the public era and that the following aspects require special attention:

- a) ensuring the health and safety of people living in the proximity of nuclear projects;
- b) explaining basic information to the public regarding nuclear waste, including the amounts generated and its treatment;
- c) mitigating public fear of nuclear catastrophes and ensuring appropriate management of such incidents; and
- d) addressing non-radiological aspects relating to operation including pollution and soil contamination.

Mr. Abraham noted the vastly different socio-economic strata of people in India and the critical need for effective communication via appropriate channels for each segment of the population. He suggested that the manner in which information is communicated should be tailored to address each particular audience, and that communication may be very different with the urban middle class versus blue collar workers in rural areas or illiterate people. He stated that one should design a communication strategy in a creative manner to ensure effective results.

Mr. Abraham claimed that examining models for public communication that have been successful in other countries, such as the model institutionalised in France to educate its citizens about nuclear energy, may be useful. He argued that India may require a different approach in light of socio-economic considerations. However, one possible model could focus on public awareness efforts through the training of school teachers, doctors and other public officials who in turn disseminate information to the local community. He suggested that appointing local information officers on a permanent basis to address queries and provide information to the general population is one possible option. He stressed that all of these approaches should be institutionalised in laws that expressly provide people with the right to information and transparency in relation to nuclear power projects in India, and that this approach would go a long way toward building trust in nuclear energy in the general population.

- Dr. Anupam Jha, Assistant Professor, Faculty of Law, University of Delhi⁹

Dr. Jha examined the impact of international and national law on the safety of nuclear power plants in India, the international peer review system and the functioning of the regulatory authorities in India. On the issue of the international peer review system, Dr. Jha highlighted the importance of the Convention on Nuclear Safety, to which India is a party, and the weaknesses of its review system of nuclear power plants in member states. He claimed that the Fukushima accident proved that peer review by independent experts on a constant basis could significantly enhance safety at nuclear power plants because the awareness that any plant could be subject to review by independent experts would give operators an additional incentive to implement the highest possible safety standards.

Dr. Jha stated that the nuclear establishment in India considers the safety of nuclear power plants to be its primary objective. Dr. Jha was, however, of the view that the institutional structures which have been created to meet this objective have by and large not been successful in doing so. He also touched upon the issue of regulatory independence, noting that the AERB has not been granted enough power to implement its safety codes and practices because the AERB is dependent administratively as well as financially on the DAE. He claimed that although the need of a completely independent regulator with full powers to implement safety regulations has been accepted by the government in the wake of the Fukushima accident, the actual configuration of the powers of the proposed new Nuclear Safety Regulatory Authority is difficult to assess.

Dr. Jha raised the issue of transparency, claiming that even though the Indian legislature has enacted the Right to Information Act, 2005,¹⁰ citizens are not enjoying the full benefit, especially in the field of nuclear safety. He noted that the recent example of the NPCIL withholding certain information related to the Kudankulam nuclear power plants on the basis that the Russian partner would withdraw from the project if information had been revealed shows the inadequacy that must be addressed in dealing with public concerns about nuclear safety.

9. Dr. Anupam Jha's paper on "Dynamics of Legal Regime on Safety of Nuclear Power Plants in India" will be published in 2013 in the *Journal of Risk Research* as noted above.

10. Act No. 22 of 2005, available at: <http://rti.gov.in/webactrti.htm>.

Panel Session 3: Nuclear Liability and Insurance: Impact on Commercial Viability

- Chair: Patrick Reyners, Advisory Council Member, Nuclear Law Association & Scientific Advisor, International Nuclear Law Association
- Pierre Charreton, Chief Administrative Officer and General Counsel, AREVA

Mr. Charreton underlined that there are significant differences among civil nuclear liability legislations in different countries, while also observing that all civil nuclear liability regimes are nevertheless based on some common legal principles which remain the cornerstone of the nuclear liability regimes and by extension the nuclear sector. He explained that the five principles that tend to underpin most nuclear liability regimes are: (1) channelling of liability; (2) no-fault liability; (3) limitation of liability in amount and time; (4) mandatory financial security matching the amount of the operator's liability; and (5) exclusive jurisdiction so that all claims are handled by a single dedicated jurisdiction.

Mr. Charreton explained that the importance of the legal channelling mechanism lies in the fact that the operator, who is primarily responsible for the nuclear safety of its installation, is exclusively liable to the victims of nuclear damage. He noted that at the same time, the legal channelling mechanism has ensured that nuclear suppliers have not been exposed to a disproportionate risk, which in turn could act as a deterrent and could in turn affect the development of the nuclear energy industry, and nuclear energy by extension. He clarified that as a result of this legal channelling system, victims do not have to investigate whether the operator, the supplier, the designer, or the carrier actually caused the nuclear incident. He stated that the Bhopal tragedy was an example of what is likely to happen in the event of a large disaster if liability principles such as those developed in the nuclear industry do not exist. As a result, it is critical, even from a potential victim's perspective, that the legal channelling principle to the operator remains robust.

Mr. Charreton insisted on the relevance of the international civil nuclear liability regimes, which have been again confirmed in the most recent amendments to the Paris and Vienna Conventions. For him, it is essential that the basic principles of the civil nuclear liability be kept together, as one missing principle would be detrimental to the interests of possible victims as well as the nuclear energy industry. He argued that these intertwined principles have proven their efficiency in structuring the nuclear industry via a genuine allocation of risk, while ensuring a rapid indemnification of victims and the availability of funds in the unlikely event of a nuclear incident.

Given the transboundary dimension of the potential outfall of a nuclear incident, he stated that it is equally important for countries to ensure the equal treatment of all victims including those not located in the state in which the nuclear installation is located. He claimed that the best option for countries is to be part of an international treaty regime highlighting that once a country joins such an international regime, the domestic operator also obtains access to the global insurance market, which is of critical importance. He stated that obtaining such insurance is in turn assurance for the general public that sufficient funds will be available in the event of a nuclear incident. Mr. Charreton believes that striving toward a strengthened harmonisation between the various domestic and international nuclear liability regimes is critical for everyone involved – the potential victims of a nuclear incident as well as the nuclear industry.

Turning his attention to AREVA's experience in India, Mr. Charreton concluded that AREVA sees its presence in India as one aimed at forging strong partnerships based on win-win approaches, where joint research and development can be undertaken, and with a strong emphasis on localisation. Mr. Charreton also

observed that during the years that AREVA has been present in India, it has witnessed the development of an increasingly proactive and thorough government regulator at work.

- Y. Ramulu, Deputy General Manager (nuclear insurance), General Insurance Corporation of India (GIC Re)

Mr. Ramulu argued that the passing of the Civil Liability for Nuclear Damage Act, 2010 was a major turning point in the history of nuclear industry in India. He explained that by way of this act, the operator of a nuclear facility is strictly liable for compensation as stated in Section 6(2), adding that Section 8 of the Act requires the operator to maintain insurance or financial securities to cover its liabilities.

He remarked that the coverage up to the prescribed liabilities may be easy for state sponsored companies like NPCIL. However, as and when the nuclear sector opens up to private players, the availability of cost effective insurance and/or financial security will pose a major hurdle for them to enter the marketplace.

He argued that nuclear insurance is an unattractive market as a result of its inherent characteristics such as a large capacity requirement, unknown/undesirable accumulation of risk, low probability/frequency with corresponding high severity, catastrophic nature of risk, very few number of risks worldwide, few past claims history, shortage of expertise, or the exclusion of nuclear perils from individual policies, and, hence, any such insurance coverage is offered with an objective of catering to social and national obligations rather than one of profit making.

He explained that nuclear power plants are divided into a “hot zone,” the critical area in which the nuclear reactions take place, and a “cold zone” where steam generated turbines are operated. He went on to note that in India, insurance covers material damage to assets and consequent business interruption, as well as damage to the cold zone of a nuclear power plant arising out of fire, lightning, flooding, earthquakes, or machinery breakdown, whereas insurance coverage for damage relating to the “hot zone” is not available. In the current commercial scenario wherein NPCIL is the sole commercial operator, he stated that there is an immediate need for insurance coverage of the 6 power stations and their 20 reactors, which would require an enormous insurance capacity.

Mr. Ramulu explained that such risks are covered internationally by insurance pools that are usually country-specific in nature, with few exceptions including the Nuclear Risk Insurers (UK), the French Atomic Risk Insurance Pool (Assuratome) and the Czech Nuclear Insurance Pool. There are around 26 nuclear insurance pools operational worldwide. He noted that the inspection of the nuclear installations, a prerequisite for the coverage of such installations from international insurance pools, is a major hurdle in the creation of the nuclear insurance pool for India.

He announced that GIC Re has taken initiative toward the creation of a nuclear insurance pool for India and is actively engaged with all the relevant stakeholders in this regard.

Mr. Ramulu clarified that one of the ideas which emerged was to proceed with establishing a domestic insurance pool based upon commitments from Indian insurance companies, which would then be supplemented, as necessary, with financial support from the government of India to provide sufficient funds to constitute a viable insurance pool.

GIC Re is of the view that with the right approach, these issues can be resolved and India can have its first nuclear insurance pool.

- Dr. Jitendra Kumar, Legal Advisor, Department of Atomic Energy¹¹

Dr. Kumar began with an overview of the policy landscape, noting that India is a large country, both in terms of surface area as well as population, and arguing that it is therefore necessary to exploit the full potential of all resources, including nuclear energy, in a safe manner. He believes that overall policies with regard to India's pursuit of nuclear power should be viewed against this background. He explained that India has established a legal framework to address the incidental issues related to nuclear energy including safety, security and non-proliferation, as embodied in national laws, international conventions, treaties and agreements to which India is party.

Outlining the legal framework, Dr. Kumar mentioned that the Atomic Energy Act, 1962 is the primary legislation for the governance of nuclear issues in India. The Atomic Energy Regulatory Board (AERB) has functioned since 1983 under this Act. To convert the *de facto* autonomy of the regulator into a *de jure* one, he explained that the Nuclear Safety Regulatory Authority Bill, 2011 has been introduced in Parliament and is going through the legislative process. Dr. Kumar clarified that nuclear trade is regulated through the Guidelines for Implementation of Arrangements for Cooperation Concerning Peaceful Uses of Atomic Energy with Other Countries for nuclear transfers, issued on 4 July 2010. Subsequent to the relaxation of the NSG guidelines with respect to nuclear trade with India, he noted that India has signed agreements of co-operation with France, the US, the Russian Federation, Namibia, Argentina, Canada, Kazakhstan and the Republic of Korea, as well as memoranda of understanding with the UK and Mongolia. He believes that as this process continues and India's nuclear power programme expands, India's engagement in the international arena will intensify, leading to the further evolution of the framework for governance to support India's accelerated growth in the installed nuclear capacity base.

Dr. Kumar stated that the Civil Liability for Nuclear Damage Act, 2010, was enacted to provide prompt compensation to the victims of a nuclear incident, should such an unlikely event occur. He explained that the Act provides for the channelling of liability to the operator of a nuclear installation through a no-fault liability regime. He went on to explain that although some concerns have been expressed about Rule 24, in fact, this Rule does not restrict the scope of the operator's right of recourse contained in Section 17 of the Act, either in amount or duration.

He clarified that the Rule specifies a minimum amount for the operator's right of recourse under Section 17(a) and the corresponding time period for which this right must be valid. However, nothing in Rule 24 prohibits the operator and the supplier from agreeing to a larger right of recourse in the contract. He further clarified that the Rule makes no mention of the other two clauses of Section 17 which stand alone, and that Rule 24 protects the interests of the suppliers who would be supplying nuclear material or nuclear equipment or components of low value.

He stated that it would be unreasonable to expect every supplier, irrespective of the value of the contract with the operator, to be liable for the full amount of the operator's liability under the Act. In his opinion, arguments that large contracts can be split into several smaller value contracts, thereby effectively limiting liability, is based neither on facts nor practice. He stated that, as a matter of fact, any nuclear incident is the result of failure of several pieces of safety equipment and thus the supplier of one particular component cannot be held solely responsible for an incident. Dr. Kumar added that the duration of the operator's right of recourse needs

11. Dr. Kumar is the Legal Adviser to the government of India. This presentation was solely in his personal capacity and can in no way be attributed to the government of India.

to be examined keeping in mind that plant life and equipment life are not the same, rationalising that the life of equipment can be much less than the life of the nuclear power plant, and equipment is guaranteed only for its own life and not for the life of the plant. Thus, he analysed, the right of recourse for equipment or service has to be linked to the specific product liability period and Rule 24 extends the duration of this right to the period of the initial licence in cases where this period is longer than the product liability period stipulated in the contract.

As to the misconception that Explanation 2 to Rule 24 restricts the operator's right of recourse, Dr. Kumar recalled that Section 17 of the Act provides the operator with a right of recourse only "after paying the compensation for nuclear damage in accordance with section 6" of the Act. He explained that this provision essentially means that the operator's right of recourse cannot be more than the amount actually paid as compensation under Section 6. He added that one must rely on the definitions within the Act and established principles of contractual obligations in order to ascertain the nature and extent of liability under the Act and the Rules.

Upon being asked to put forward his analysis of Section 46 of the Liability Act which states that "the provisions of this Act shall be in addition to, and not in derogation of, any other law for the time being in force, and nothing contained herein shall exempt the operator from any proceeding which might, apart from this Act, be instituted against the operator", Dr. Kumar opined that Section 46 is clear in its importance in as much as it refers to liabilities other than civil liability for nuclear damage, e.g. criminal liability or environmental offences.

In response to a query as to the compatibility of the Act with the Convention on Supplementary Compensation for Nuclear Damage (CSC), Dr. Kumar referred to Article XII (2) under Chapter IV of the CSC on the exercise of options, according to which "[n]othing in this Convention shall prevent any Contracting Party from making provisions outside the scope of the Vienna or the Paris Convention and of this Convention, provided that such provision shall not involve any further obligation on the part of the other Contracting Parties, (..)"¹²

Upon enquiry by the Chair of the Session about whether India would consider having its national legislation peer reviewed by an international body/treaty mechanism – as was the case with Germany under the Paris Convention when it decided to revert to an unlimited liability principle in its domestic legislation – Dr. Kumar clarified that the Indian law must be seen as legislation of a sovereign country and the democratic expression of the will of a nation with 1.21 billion people. Ultimately, the law can be reviewed only by the Parliament or the judiciary in accordance with the Constitution of India.

Dr. Kumar concluded that the Act does away with certain outdated notions of nuclear liability, in particular the restricted view of legal channelling, and may well be a forerunner of a new model of domestic legislation. He stated that this novel approach may in the long run influence the outlook of the classic international nuclear liability regimes, none of which qualifies as a global nuclear liability regime – a goal still to be pursued.

Lastly, Dr. Kumar reminded the audience that the authoritative interpretation of laws is ultimately only a judicial prerogative and the constitutionality of both the Act and the Rules is currently under examination by the Supreme Court of India in the public interest litigation pending before it, and, hence, is a matter *sub judice*. He clarified that it is, therefore, the Supreme Court's judgment that must be awaited as

12. Convention on Supplementary Compensation for Nuclear Damage (29 September 1997), 36 ILM 1473, available at: <http://www.iaea.org/Publications/Documents/Infcircs/1998/infcirc567.shtml>.

the court is the only authority on the status and interpretation of the Act and the Rules. He suggested that all interested parties would be well advised to engage in due diligence and should be encouraged to consult professionals of their choice in making conscientious business decisions for themselves.

- S. K. Dhiman, Head, Corporate Legal Group, Nuclear Power Corporation of India Limited (NPCIL)

Complementing the view of Dr. Kumar, Mr. Dhiman reiterated the fact that the Civil Liability for Nuclear Damage Act, 2010 must be seen as a “complete code”, arguing that everything is clearly stated in the Act itself. Hence, he believes that no civil court will have jurisdiction in case of a nuclear incident, noting that Section 35 of the Act bars filing any claim against the *operator* in any court. He explained that even Section 46 of the Act widens its scope only vis-à-vis the operator and not the supplier. Moreover, Mr. Dhiman re-emphasised that in this context the Atomic Energy Act, 1962, permits only the government, an authority or corporation established by the government or a “government company” to operate a nuclear power plant in India, which is reflected in Section 1(4) of the Civil Liability Act. He noted that the Civil Liability Act contains numerous provisions which directly target the operator (NPCIL), but apart from the right of recourse provision pertaining to the operator-supplier relationship, private companies as such cannot be prosecuted under the Act.

Mr. Dhiman added that the Civil Liability Act must clearly be seen as a “*lex specialis*” – that is, in the event of conflict between the Civil Liability Act and the general rules of (tort) law, the specific provisions of the Civil Liability Act would necessarily prevail based on the principle that a later specific statute overrides the provisions of a prior general statute (*lex specialis derogat leg generali*).

NEA PUBLICATIONS AND INFORMATION

The full catalogue of publications is available online at www.oecd-nea.org/pub.

In addition to basic information on the Agency and its work programme, the **NEA website** offers free downloads of hundreds of technical and policy-oriented reports.

An **NEA monthly electronic bulletin** is distributed free of charge to subscribers, providing updates of new results, events and publications. Sign up at www.oecd-nea.org/bulletin/.

You can also visit us on **Facebook** at www.facebook.com/OECDNuclearEnergyAgency.

Follow us on **Twitter** @OECD_NEA.