

Nuclear Energy and Indian Society: Public Engagement, Risk Assessment and Legal Frameworks

Third Annual Meeting of the
Nuclear Law Association of India
1 March 2014
New Delhi, India

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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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Nuclear energy and Indian society: Public engagement, risk assessment and legal frameworks

Third annual meeting of the Nuclear Law Association of India

1 March 2014, India Habitat Centre, New Delhi

Summary of the proceedings¹

The third annual meeting of the Nuclear Law Association, India (NLAI) was held on 1 March 2014 in New Delhi. This year's overarching theme was "Nuclear energy and Indian society: Public engagement, risk assessment and legal frameworks".

Several of the papers presented will be published in the *Journal of Risk Research* in early 2015 as part of the *Special Issue on Nuclear Energy and Indian Society: Public Engagement, Risk Assessment and Legal Frameworks*.²

Inaugural session

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

Dr. Ram Mohan, President of the NLAI and Fellow at TERI, welcomed 75 participants to the Third Annual Meeting of the NLAI. In his address, Dr. Mohan announced the launch of the "Centre for Nuclear Risk Analysis", a dedicated research centre within NLAI, which will undertake wide-ranging research covering all subjects relating to civil nuclear energy development in India and its engagement with the wider world. The Centre for Nuclear Risk Analysis will provide an opportunity for experts and researchers from all disciplines to closely interact and undertake nuclear energy risk studies.

Presidential address: Ambassador Rakesh Sood, Prime Minister's Special Envoy for Disarmament and Non-Proliferation³

Following Dr. Mohan's welcome address, Ambassador Sood provided the presidential address, speaking about nuclear energy's place in the broader context of India's Integrated Energy Policy (IEP).⁴ The IEP was the first comprehensive document linking energy policy with sustainable development, covering all sources of energy, their use and supply, access and availability, affordability and pricing, environmental concerns, and energy security.

1. This summary was prepared by Els Reynaers Kini, Partner, MV Kini & Co. and General Secretary, NLAI; Dipankar Bandyopadhyay, Partner, Verus Advocates and Member, NLAI; and Bhanudey Kanwar, Associate, PXV Law Partners. The proceedings of the Nuclear Law Association, India Third 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/rjrr20.
3. The complete version of Ambassador Sood's Presidential Address is available at: www.nlain.org.
4. The Integrated Energy Policy was released in 2006 and formally adopted in 2008. It is available at: http://planningcommission.nic.in/reports/genrep/rep_intengy.pdf.

Ambassador Sood also referred to the reality in India where nearly a quarter of the population lacks access to electricity, and energy poverty has been identified as a hindrance to economic development. The IEP identified energy security as a key element in its policy framework. Ambassador Sood referred to the fact that the fuel mix for power generation in 2035 would remain fairly similar to what it is today, with fossil fuels being the dominant resource; this implies, in turn, a growing import dependency. Nuclear energy currently only accounts for approximately 1% of energy consumed in India. In terms of power generation, with an installed capacity of 4.8 GW, nuclear accounts for slightly over 2% of the total installed capacity, which is estimated at 225 GW and includes thermal power, hydro and renewable energy sources. Therefore, even though nuclear energy will remain a small part of the overall energy mix, it is a critical part in addressing India's energy challenges, mitigating carbon emissions and enhancing energy security by reducing dependence on foreign energy sources.

After providing a historical perspective of India's nuclear trajectory, Ambassador Sood described the current status of nuclear energy in India. He explained that it was only after 2008, when the civilian side of the nuclear sector was separated from the weapons and military side and more facilities were brought under International Atomic Energy Agency (IAEA) safeguards, that the civilian programme started responding to the growing public scrutiny and demand for accountability. This has been a major change in India, but it is still a "work-in-progress". However, while transparency and accountability of the nuclear establishment is essential to develop public support and confidence, Ambassador Sood pointed out that it is equally important that one refrains from falling into either the "anti-nuclear trap" or the traditional criticisms of the last 30 years, when even the civilian aspect of the programme was classified. Today, while there is a strong case to be made out for nuclear power both in terms of energy security and mitigating carbon emissions, concerns over safety aspects, as well as cost effectiveness, will have to be satisfactorily addressed. Therefore, public engagement and risk assessment become important. Ambassador Sood firmly stated that "our citizens must have confidence in the regulatory processes".

Lastly, Ambassador Sood touched upon the concerns raised vis-à-vis India's nuclear liability law. Ambassador Sood explained that in the 1950s, only the US had a nuclear industry and the US private sector needed liability protection to establish a global market. However, he observed that today the situation is different and there is a growing feeling that this exclusive channelling is no longer helpful. The Indian law, in this regard, may not be consistent with existing practice but it is much more consistent with the spirit of the times. He further stated that the "idea of some measure of supplier liability is an idea that can no longer be bypassed", but what needs to be ensured is that it does not become "infinite" or "open ended". Therefore, in the future, Ambassador Sood felt that there should be a "genuine effort to address the concerns of the suppliers' community so that their liability is not ambiguous and open ended but can be quantified in a manner that does not raise costs to prohibitive levels". He concluded by stating that such an approach would actually advance international nuclear liability law.

Inaugural address: Shri S.A. Bhardwaj, former Chairman & Managing Director, Nuclear Power Corporation of India Limited (NPCIL), and Director (Technical), NPCIL⁵

Shri Bhardwaj gave the inaugural address, and began by touching upon the notion of risk assessment and human efforts to reduce both the magnitude of the potential harmful consequence of an accident happening, as well as the probability of that accident happening. He emphasised how nuclear scientists and technologists

5. The complete version of Shri Bhardwaj's inaugural address is available at: www.nlain.org

work to ensure the safety of nuclear power plants (NPPs) and minimise their risk by making improvements in new designs and backfitting improvements in older plants. Shri Bhardwaj proudly shared that India's 20 operating units recorded a combined 370 years of safe operating performance, which is a testament to the care taken in all areas of design, construction and operation.

That said, Shri Bhardwaj acknowledged that the public does not share his confidence in nuclear energy. This lack of confidence arises in part because the application of nuclear technology was first visible to the public only as an instrument of war. Only later has nuclear technology come to be known for other uses, such as a source of energy to produce electricity. This first impression of nuclear as a destructive means has continued and embedded itself deep in the general public's psyche. Specifically, the public at large in India indicates that their two main concerns relate to: (1) personal safety and (2) waste management. Shri Bhardwaj, however, emphasised that safety is given highest priority in India during all stages of the fuel cycle and that regulatory limits for radiation exposure for protection of workers, public and the environment are set at conservative low levels. These limits are set by the Atomic Energy Regulatory Board (AERB) and are in line with international norms specified by the International Commission on Radiological Protection (ICRP).

Following Shri Bhardwaj's assurance of India's commitment to safety, he elaborated in detail India's response to the public's genuine concern regarding radioactive waste management. While explaining the issues associated with the radioactive isotope decay process, Shri Bhardwaj provided examples from India's own nuclear plants. He then discussed the Department of Atomic Energy's (DAE) facility for embedding the 3% of spent fuel waste that is not recyclable as fuel material in vitrified form in glass matrix for safe storage. Shri Bhardwaj announced that research and development on further separation of these long-lived minor actinides during fuel reprocessing has recently been completed and it will now be possible to partition the waste to separate these minor actinides. These can be "transmuted" or burnt and could practically get eliminated by inducing fission in fast breeder reactors or other reactors of second and third stage of India's nuclear power programme.⁶ He added that the thorium-based fuels of the third stage will produce negligible minor actinides. Importantly, the vitrified high-level volumes currently stored in the Vitrified Waste Storage Facility are very small in the country. The partitioning of waste and burning it will further bring down high-level waste (HLW). The remaining waste will have a half-life of about 30 years and would decay in 300 years.

As a result of the Indian public's general lack of confidence in nuclear power, Shri Bhardwaj discussed the tools adopted in India to reach out to the public. Nuclear power stations in particular are actively involved in carrying out regular public awareness programmes for people living in the vicinity of nuclear power plants. People are invited and taken on guided tours of the nuclear power stations and provided information about the basics of radiation protection, safety practices and the "dos and don'ts" during a nuclear emergency. The station authorities also visit the surrounding villages and population centres to provide the same

6. A succinct overview of India's three-stage nuclear programme is available at: www.npcil.nic.in/main/faq.aspx#1.

information.⁷ Shri Bhardwaj emphasised that “our experience is that a continuous engagement to educate the people about the beneficial aspects of nuclear radiation and to remove their misgivings about it is very necessary”.

Shri Bhardwaj concluded his remarks by quoting a paragraph from the recent Supreme Court judgment, which stated that:

Power generation through a nuclear plant set up after following all safety standards, rules and regulations, is for the welfare of the people and for the economic growth of the country, which is the object and purpose of the Atomic Energy Act. Nuclear energy assumes as an important element in India's energy mix for sustaining economic growth of natural and domestic use which in future has to replace a significant part of fossil fuel like coal, oil, gas etc. Electricity is the heart and soul of modern life, a life meant not for the rich and famous alone but also for the poor and down trodden. ... Power generation with the traditional means, through hydro, thermal electric project, coal etc. are not effective substitution to the power generation through Nuclear Plant. ... Energy tariff is also increasing, nuclear power in the long run will be much cheaper than other forms of energy.⁸

Special address: Shri Gourab Banerji, Additional Solicitor General, Supreme Court of India

In his special address, Shri Gourab Banerji reported on the most recent Supreme Court cases pertaining to the nuclear sector. Shri Banerji first noted that the Writ Petition, which directly challenges the constitutionality of the Civil Liability for Nuclear Damage Act, 2010, has not yet been heard by the Supreme Court.⁹

Next, Shri Banerji discussed the judgment delivered on 6 May 2013 by the Supreme Court of India in *G. Sundarrajan v. Union of India & Others*.¹⁰ This case arose out of an appeal filed against the 31 August 2012 Madras High Court order, which dismissed the Writ Petition seeking to declare as null and void the 28 August 2012 AERB clearance allowing the initial fuel loading and first approach to criticality of the Kudankulam Nuclear Power Plant (KKNPP) unit 1. The Madras High Court displayed an apparent reluctance to interfere in policy matters and highly technical matters in which it felt it had no expertise.

Shri Banerji appeared in the matter and shared in detail how the Supreme Court sought to arrive at a fine balance between non-intervention in policy-related matters and close scrutiny of technologies where safety is of paramount importance to the public at large. The judges were determined to understand as much as possible all of the relevant technical aspects of the case, which led to very interactive hearings where the judges directly sought clarifications from the technical experts at the

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7. The NPCIL web page has an open invitation to people who want to know more about nuclear power, either through visits to power stations or providing responses to their questions. For example, over 63 000 visitors in 1 234 groups visited nuclear power plants last year. Rural outreach was enhanced during the year and more than 100 000 villagers reached out through various initiatives. For instance, Fatehpur in Haryana is a new site where NPCIL is initiating construction of two units of 700 MWe. A large scale programme has been going on at and around this site. The major programmes were an “Exhibition on Wheels” (mobile vans), “Farmers Integration Programmes” around the Haryana site in association with a local university and the Indian Council of Agricultural Research and street plays for rural outreach among other activities.
 8. *G. Sundarrajan v. Union of India & Ors.*, Civil Appeal No. 4440 of 2013, 6 May 2013, para. 182, available at: <http://judis.nic.in/supremecourt/imgs1.aspx?filename=40374>.
 9. *Common Cause & Ors. v. Union of India & Ors.*, Writ Petition (Civil) No. 464 of 2011.
 10. *G. Sundarrajan v. Union of India & Ors.*, Civil Appeal No. 4440 of 2013, 6 May 2013, *supra* note 8.

hearings. Though the petitioners had made it clear that they were not inherently opposed to nuclear energy *per se*, the judges made sure that “every ‘i’ was dotted and every ‘t’ was crossed”.

The lead judgement essentially consists of three parts: (1) an introduction and general preamble; (2) the first part of the judgement, which focuses on safety and security issues; and (3) the second part of the judgement, which addresses environmental aspects. The introduction offers a summary of the legislative history of the various enactments in India pertaining to the nuclear sector, as well as India’s national policy on atomic energy, and an overview of the 20 operating nuclear power reactors in India as part of the implementation of this overarching nuclear energy policy adopted for the “welfare of the people and for other peaceful purposes”.¹¹ Although the Supreme Court firmly reiterated that it “is not for Courts to determine whether a particular policy or a particular decision taken in fulfilment of a policy, is fair”, the court felt its attention was warranted on other aspects raised by way of appeal, including safety and security, as well as environmental concerns.¹²

The first part of the judgement, on safety and security, addresses a long list of policy-related issues¹³ and then further delves into the essence of “radioactive material”, its regulation, actions and safety assessments undertaken in India post-Fukushima. Importantly, the Supreme Court closely scrutinised the government’s response to “people’s resistance” against the production of nuclear energy, as well as against the commissioning of the KKNPP. The Court also dedicated many pages to the disaster management plans, related guidelines, public awareness efforts undertaken, along with emergency exercises (on- and off-site) being undertaken in India. Finally, the first part looks into the Corporate Social Responsibility (CSR) obligations resting on all central public sector enterprises, and more specifically, how this CSR obligation was implemented for the people living in the vicinity of the KKNPP, where the Supreme Court reiterated the need for there to be “an effective and proper monitoring and supervision of the various projects undertaken under CSR, to the fullest benefit of the people who are residing in and around the NPP”.¹⁴ In Shri Banerji’s opinion, the first part of the judgment reads like a “wide-ranging policy paper” given the diversity of issues addressed by the Court, upon which it also offered its view and recommendations.

The second part of the judgement specifically addressed the issue of Environmental Impact Assessment (EIA) Regulations, taking into account the fact that the Environmental Clearance granted for KKNPP units 1 and 2 in 1989 by the Ministry of Environment & Forests (MoEF) pre-dated the 1994 EIA Notification, as later amended in 2006, which also contained a detailed public hearing process to be followed.¹⁵ However, the Environmental Clearances for units 3-4 were granted in 2008 and for units 5-6 in 2012. The Supreme Court also addressed, in some detail, the manner in which the desalination plant was being approached under the latest amended Coastal Regulation Zone (CRZ) Notification. It ultimately concluded that:

11. See *ibid.*, para. 11.

12. *Ibid.*

13. For example, the judgement touches upon the status of international and bilateral treaties; AERB safety codes; the role of the IAEA; the KKNPP project itself; nuclear spent fuel (NSF) and how it is regulated in India; NSF and management of waste in India; NSF waste and transportation, along with India’s “closed fuel cycle” approach and reprocessing capabilities; as well as deep geological repository (DGR) options in India where the Supreme Court even went so far as to caution that the Union of India “should find out a place for a permanent DGR” as “[s]toring of SNF at NPP site will, in the long run pose[] a dangerous, long term health and environmental risk”. See *ibid.*, para. 66.

14. See *ibid.*, para. 107.

15. See *ibid.*, paras. 108-190.

all the expert teams are unanimous in their opinion of the safety and security of the KKNPP both to life and property of the people and the environment, which includes marine life. Court has to respect national nuclear policy of the country reflected in the Atomic Energy Act and the same has to be given effect to for the welfare of the people and the country's economic growth and it is with these objectives in mind that KKNPP has been set up.¹⁶

With regard to the constitutionally guaranteed "right to life", Mr. Justice K.S.P. Radhakrishnan went even further by stating that:

While balancing the benefit of establishing KKNPP Units 1 to 6, with right to life and property and the protection of environment including marine life, we have to strike a balance, since the production of nuclear energy is of extreme importance for the economic growth of our country, alleviate poverty, generate employment etc. While setting up a project of this nature, we have to have an overall view of larger public interest rather than smaller violation of right to life guaranteed under Article 21 of the Constitution.¹⁷

Mr. Justice Dipak Misra concurred, essentially stressing the paramount importance of safety. That is, while he acknowledged that "safety of the State is the supreme law and in case of any conflict, an individual must yield to the collective interest",¹⁸ he nevertheless added that "it should not be done at the cost of safety" and that at all times "sincere efforts are to be made to maintain and sustain the safety of the people".¹⁹

Shri Banerji concluded by observing that the Supreme Court clearly acknowledged that nuclear energy is here to stay for the long-term in India (and it will not question that policy choice), but the court will closely scrutinise the compliance and safety record. As a result, the nuclear establishment will have to become even more proactive about public scrutiny, as well as the detailed (and even technical) scrutiny by the courts.

Panel Session 1: Public engagement, consultation and acceptance of nuclear projects

- Chair: Siddharth Varadarajan, Senior Journalist and Fellow, Centre for Public Affairs and Critical Theory

Following the Inaugural Session, the first panel session was held. Panel Session 1 covered "Public engagement, consultation and acceptance of nuclear projects" and was chaired by Siddharth Varadarajan, a Senior Journalist and Fellow at the Centre for Public Affairs and Critical Theory. Five diverse speakers participated on the panel, representing academia, government and industry.

At the outset, Mr. Varadarajan observed that the very existence of the Nuclear Law Association of India is a sign of the "coming of age" of nuclear issues in India and a reflection of the fact that nuclear energy is likely to play a larger role in the country's energy mix. He described the broad challenges faced by the nuclear energy sector in the face of the country's nuclear weapons programme and the international sanctions that remained in place until 2008. As a result, India was constrained to undertake indigenous research and development on nuclear energy. The Indo-American Civil Nuclear Cooperation Agreement (popularly known as the "123 Agreement") and the exemption obtained by India from the restrictive

16. *Ibid.*, para. 190.

17. *Ibid.*, para. 175.

18. *Ibid.*, para. 216.

19. *Ibid.*

guidelines of the Nuclear Suppliers Group marked a watershed moment in the development in the sector.

Mr. Varadarajan said the separation of India's civil and military nuclear programmes will not only allow the former to expand on the basis of international co-operation but should also facilitate greater transparency, accountability and scrutiny because the nuclear establishment can no longer hide behind the veil of "national security".

Since India is on a path of rapid nuclear energy expansion, there is bound to be greater public scrutiny, and even public opposition, he said. Given his long-standing experiences as a journalist, Mr. Varadarajan observed that even the media in India is not really used to asking probing questions relating to the nuclear sector. Mr. Varadarajan further conceded, as did other speakers in the inaugural session, that nuclear energy has its risks and limitations, even if these may not be as dramatic as some of its opponents claim. What this means is that the government and the nuclear establishment need to actively and openly engage with the public on their plans for building new plants. People's fears, even if we think they are baseless, need to be addressed properly. Only in this way will nuclear power win acceptability.

Mr. Varadarajan strongly condemned the treatment meted out to those opposed to the establishment of nuclear power plants by the state and police authorities in some states. He expressed his concern for the manner in which the government has at times used strong-arm and coercive tactics to deal with opposition it faces for promoting its civil nuclear programme. He concluded by emphasising the need for public engagement and scrutiny of all nuclear projects for the overall success of India's civil nuclear programme.

- Mahesh Kamble, Tata Institute of Social Sciences, Mumbai

The panel's first speaker was Mahesh Kamble, an expert in the field of disaster management and governance and policy relating to disaster management. Mr. Kamble has conducted extensive research and surveys, including looking into the extent of public engagement and awareness of the Jaitapur Power Plant in Ratnagiri district in Maharashtra. As such, primarily addressing Jaitapur, Mr. Kamble spoke about the *perception* of risk being a guiding factor for the opposition, stating that the opposition to the setting up of the nuclear power project stems from the misguided understanding or lack of information giving rise to the higher perception of risk. Providing an example, Mr. Kamble stated that the opposition to the Jaitapur project stems from the loss of faith and trust in the government and the operator, NPCIL. Mr. Kamble stated that the loss of public trust in the proponents of the project is the single largest factor for the opposition being faced at Jaitapur and he suggested that the proponents of a project where risk is perceived ought to undertake steps well in advance to ensure that there is no opposition.

Mr. Kamble stated that not clearing the air about the project and its establishment, and by providing no response to the queries raised by the public, especially those living in the vicinity of the project, however misguided the queries may be, led to a feeling of loss of trust and victimisation at the hands of the proponents, resulting in the opposition. With specific regard to the Jaitapur project, Mr. Kamble provided the audience with instances of how the acts or behaviour of the NPCIL or instrumentalities of the government resulted in widespread opposition to the project:

- NPCIL changed its stance regarding earthquake zoning for the site of the nuclear power plant, from zone 4 to zone 3. Specifically, an NPCIL representative stated that zone 4 ends about 3 km away from the site; however, such a statement cannot be true as it is not yet possible to conduct

micro-zoning of the earthquake zones. Further, even if it is possible, such micro-zoning was not carried out at Jaitapur.

- The public hearing was conducted without affording adequate time and notice to the public to review the EIA report.
- A single copy of the EIA report was made available at the office of the district collector, where the public was afforded access only in a queued manner for a very small period time considering the nature and contents of the EIA report.
- The NPCIL did not accept a request by those affected by the nuclear power plant to re-schedule the public meeting with the Chief Minister. The meeting was scheduled to be held on the day of a very important local festival and, as a result, the genuine concerns of the affected parties could not be addressed. Moreover, the meeting was held in Mumbai and it was not feasible for the people residing around the nuclear power plant to travel to Mumbai. Therefore, family members living in Mumbai represented the residents of Raitapur, though they expressed very different concerns, and some were even interested in their family's land being sold.
- Instances arose of activists and people opposing the project being threatened with arrest. Further, there were reports of constant monitoring by the local police of the activities of those critical of the project.

Mr. Kamble also pointed out that the EIA and Social Impact Assessment (SIA) that were performed for the Jaitapur project were not proper. In summary, Mr. Kamble stated that the public's lack of information in combination with NPCIL's lack of effort to provide the information and create awareness, as well as the oppressive manner in which any opposition or criticism of the project has been handed by the proponents, have left the local population disdainful of the project. Thus, as a result of the proponents' policies, there is lack of public participation, engagement and awareness of the Jaitapur project and this, in turn, has resulted in the opposition for the same.

Mr. Kamble concluded his presentation by stating that there is a growing need for adopting a sensitive and a more targeted approach for public engagement by the government (state and central), NPCIL and other proponents of the project.

In a question and answer session, Mr. Kamble observed that in its 6 January 2014 order, the Supreme Court reiterated its previous order of 2011 that the central government should set up a national regulator for evaluating projects and enforcing environmental conditions for approvals, and to impose penalties on polluters.²⁰ The Supreme Court in January 2014 concluded that the current EIA Notification from 2006, with regard to processing, appraisals and approvals of the projects for environmental clearances, is deficient as of now and "what is required is a Regulator at the national level having its offices in all the States which can carry out an independent, objective and transparent appraisal and approval of the projects for environmental clearances and which can also monitor the implementation of the conditions laid down in the Environmental Clearances".²¹ Dr. Rastogi, a panelist in Panel 3, added that in the 2011 *Lafarge Umiam Mining Private Limited v. Union of India & Ors.* matter, the Supreme Court had also directed that the MoEF should prepare a panel of accredited institutions from which alone the project proponent should

20. T.N. Godavarman Thirumulpad v. Union of India & Ors., Writ Petition (Civil) No. 202 of 1995, 6 January 2014, para. 1, available at: <http://supremecourtindia.nic.in/outtoday/WC2021995.pdf>.

21. *Ibid.*, para. 7.

obtain a “Rapid EIA” and the Terms of Reference (TOR) were to be formulated by the MoEF only, rather than the project proponent, to increase the credibility of these EIA reports.²² The MoEF has been closely following these directions since 2011. Moreover, Dr. Grover, Chair of Panel 2, referred to the fact that the DAE seeks the assistance of local universities to ensure the independence of the report findings and that there are very rigorous on-site environmental monitoring laboratories that functioned even well before these regulations or directions.

In response to a different question, Mr. Kamble observed that in the context of energy consumption, perhaps insufficient thought is dedicated to the distinction between energy “need” and energy “demand” or greed and, in a country such as India, there should be much more equitable distribution of electricity as all too often the areas around NPP sites may not necessarily benefit themselves from the energy generated.

- S.K. Malhotra, Outstanding Scientist & Head, Public Awareness Division, DAE

Panel 1’s second presenter was Mr. S.K. Malhotra, Head of the Public Awareness Division of the DAE. Mr. Malhotra began his presentation by citing a paragraph from the 6 May 2013 KKNPP judgement²³ to show that it is possible to craft a judicious decision that presents an amicable balance, taking into account a wide range of opinions. In response to Mr. Kamble, Mr. Malhotra conceded that the manner of public hearings will require efforts to be taken from both sides, with both the proponents and opponents engaged in a healthy discussion. While observing the current manner in which public hearings are held, Mr. Malhotra stated that it is not as conducive to open dialogue between the two parties as it should be. The general purpose of public hearing is lost as most of the hearings result in long, drawn-out speeches made sometimes by the proponents and mostly by the opponents of the project. The concerns of the public ought to be generally recorded and no decision can and should be taken *during* the public hearing. Mr Malhotra refuted some of Mr. Kamble’s claims, stating that public hearings are more often than not disrupted because of instigation by “professional activists”. At times, such activists deliberately give misguided information to the public and instil a sense of fear and uncertainty regarding the project, especially amongst those in the vicinity of the projects, thereby fuelling the opposition. For instance, during a test of the pressure system, certain steam had to be let out, which caused an alarming sound. The “professional activists” wrongly, and with questionable intentions, instigated the people in the vicinity by stating that after the plant commences operations such noises will be a daily occurrence, whereas it was absolutely exceptional.

While discussing the need for public engagement, Mr. Malhotra mentioned the public awareness initiatives conducted by the Public Awareness Division of the DAE. Mr. Malhotra explained that he personally worked to change the name of the division from the “Publicity Division” to the “Public Awareness Division”, thereby changing the underlying perception of the division and outlining the new role it was carving out for itself. As part of this new role, Mr. Malhotra elaborated upon the rural awareness programme initiated by the Public Awareness Division in the areas where projects have been proposed to be commenced, such as in Fatehabad in Haryana. Street plays are being performed to create awareness and inform the public to combat the perception of risk associated with establishing nuclear plants in the area. Moreover, it has now been made easier for one to visit any nuclear power plant

22. See *ibid.*, para. 5, quoting *Lafarge Umiam Mining Private Limited v. Union of India & Ors.*, 2011, 7 SCC 338, para. 122.

23. See *G. Sundarajan v. Union of India & Ors.*, Civil Appeal No. 4440 of 2013, 6 May 2013, *supra* note 8, para. 184.

so that the public can have a first-hand opportunity to see for themselves nuclear power plant operations.

Speaking in his personal capacity, rather than on behalf of the Indian government, Mr. Malhotra stated that he is not in favour of television advertisements. He stated that although the proponent may be able to book slots and broadcast their advertisements during prime time on national television, the advertisements that precede and follow cannot be controlled by the proponents. Therefore, Mr. Malhotra explained that if the public does not have faith in the claims of the advertisements close in time to the proponents' advertisement, this has the danger of spilling over to the proponents' *bona fide* claims.

Mr. Malhotra expanded upon the benefits of public engagement, stating that the public engagement efforts relating to nuclear power plants are highest in France; as a result, far more people are in favour of setting up new nuclear power plants than are opposed. Citing a study, Mr. Malhotra stated that the general population can be classified into four groups on an x-y plane denoting knowledge and participation. These groups are: low knowledge-low activity, high knowledge-low activity, low knowledge-high activity and high knowledge-high activity. Citing a multi-country survey conducted by the BBC in 2011 in the wake of the Fukushima disaster, he stated that in India the group with low knowledge-low activity is in the majority (38%). The anti-nuclear activists invariably take advantage of the limited knowledge of this group and provoke them by instilling undue fear about nuclear power. Therefore, there is a growing need to communicate to this "low-low" group.

Based on his experience, Mr. Malhotra conceded that the best way to engage the public is on a "one-on-one" basis. The proponents need to be able to empathetically address each member's concerns, to build their trust and take the time to address all of their issues. On a personal note, he added that he believes this is necessary even if it would mean taking the time "to share a meal with them at their house". Further, Mr. Malhotra elaborated upon the expectations of the Indian people that the government will improve their living conditions. Because the public equates the operator of nuclear facilities with the government, they expect that with the advent of the nuclear project, there would be better roads, water supply and electricity supply. Therefore, because there are large differences in the infrastructure available within the premises of the site and infrastructure (or the lack of infrastructure) in the vicinity of such nuclear power plants, steps must be taken to develop the infrastructure and improve the general living conditions around the project site as well. In response to a question about this, Mr. Malhotra explained that army "cantonment" areas could be used as a model. All too often, NPP construction reduces land values; however, this is not the case in cantonment areas. Developing the entire neighbouring community will go a long way and will probably address 90% of all the reluctance against the construction of nuclear power plants.

Mr. Malhotra also addressed the observations made by several participants that disaster management drills do not appear to be undertaken as regularly as required. Further, Mr. Malhotra mentioned that drills are sometimes simply not effective because local people refuse to participate. Often, opponents of the project have made them believe that if they take part in the drills and the mock evacuations that the government will not bring them back. Hence, there are many challenges to be overcome.

- R.K. Mishra, Superintendent (Environment), Uranium Corporation of India Ltd (UCIL)

Mr. Mishra added to the public perception and acceptability debate by providing insights into the experiences from the uranium mining industry. In his experience, he has found that public perception is more favourable in areas where UCIL has been present for a while, as opposed to in new locations. This extends even to

workers, with first generation workers in and around the mines generally more sceptical and tending to oppose the expansion projects. But, for second generation workers, mining is a source of livelihood, and they have a higher sense of attachment to the project, and do not perceive any risks associated with the project. Thus, their acceptance levels for expansion projects are quite high.

Mr. Mishra stated that UCIL has not been able to undertake expansion projects in newer areas due to public opposition and the failure to conduct public hearings. This issue stems in part from lack of awareness on the part of the public and also because of the difficulty encountered with scheduling hearings so that they do not conflict with public holidays. Further, after the Fukushima Daiichi nuclear power plant accident, Mr. Mishra has noted that there is an increased risk perception associated even with uranium mining. Mr. Mishra gave instances of how “professional activists” incited the public and directly compared the Fukushima Daiichi disaster with mining activities. Sometimes the risk perceptions in the villages are coloured by local myths and legends (e.g. animals being born without tails).

Mr. Mishra observed, however, that the most significant cause for public opposition is rooted in the compensation owed by the government for the acquisition of their land. Indeed, most of the public demands during hearings are not related to the environmental impact of the project; rather, the most common demands are for jobs, drinking water, electricity, medical facilities, improved infrastructure, education and training. The failure of the local government to satisfy these creates conflicts with the proponents of projects, though a proactive approach under CSR may prove to be an excellent tool to enable public acceptance.

▪ Ashok Chauhan, Executive Director, NPCIL

Shri Chauhan decided to respond to the day’s discussions to address the public awareness efforts undertaken by NPCIL at various levels, rather than giving his prepared speech. Importantly, Mr. Chauhan reflected on how “democracy” in India functions rather well and at multiple levels, and that NPCIL engages on all these levels to address public interest concerns. More specifically, Mr. Chauhan gave an overview of the various public bodies to which NPCIL is answerable and accountable:

- a) the regulatory bodies, including AERB; the various State Pollution Control Boards (SPCB); and the MoEF at the time of obtaining the prerequisite clearances;
- b) the parliament; the parliamentary committees, which it informs about the safety aspects of the plant; and the public at large at the time of setting up, testing and commencement of, and during, plant operations;
- c) when defending cases before the High Courts and Supreme Court, making the case for the government lawyers, i.e. the Additional Solicitor General, Advocate General, Advocate General and others;
- d) during extensive cross examination by the counsel of the opposing party;
- e) when answering the questions raised by the judges in court as to the clearances, safety features and cost-benefit analysis;
- f) at media appearances and on news shows; and
- g) at public lectures in localities, colleges and schools and any other public forum.

Because of NPCIL’s efforts, it is simply incorrect to state that NPCIL fails to address public concerns, merely because some protesters remain unconvinced or are simply against the project, whatever their reasons, or even misconceptions, may be.

Shri Chauhan concluded that NPCIL, as the operator, historically always looked at its mandate towards the public in terms of creating public awareness, but it has to wake up to new demands where it is also asked to go further and arrive at public acceptance. Although NPCIL may have had less focus in this regard, it is committed to keep engaging with the public, adopting more suitable models in this regard, as it strives to reach a high level of accountability.

- Arjyadeep Roy and Piyush Singh, law students, Hidayatullah National Law University, Raipur

At the outset, Mr. Roy, who presented on behalf of his co-author Mr. Piyush Singh, concurred with Mr. Mishra's observation that the opposition to any government project most often stems from the people's concern about government compensation for the acquisition of their land. Further, Mr. Roy explained that the government ought to provide adequate and practical measures for rehabilitation and resettlement. Mr. Roy stressed that the new Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 ("Land Acquisition Act, 2013"),²⁴ which entered into force on 1 January 2014, has provided a welcome provision of mandatory EIAs and SIAs for any proposed project to be set up or for any public purpose. But, Mr. Roy expressed his deep concern over the exemption of 16 statutes covering large infrastructure projects, including the Atomic Energy Act, from the purview of the Land Acquisition Act, 2013, as per section 105. As a result, the true intent and purpose of the Land Acquisition Act, 2013, may not be fully achieved. Section 105(3) does, however, provide the opportunity for the government to make applicable to any of the 16 statutes the provisions relating to the determination of compensation (First Schedule) and rehabilitation and resettlement (Second and Third Schedules). Thus, it remains to be seen how the government will act in the future.

Mr. Roy also expressed concern over the quality of the EIA and the competency of the organisations engaged in conducting EIA studies. For example, Mr. Roy stated that often the quality and veracity of the reports is not sufficiently cross-checked, nor is the MoEF's review of EIA Reports relating to government projects sufficiently independent. Mr. Roy explained that an independent or external review mechanism may have to be devised in such situations to avoid a conflict of interest regarding government projects, or projects undertaken by government companies.²⁵ Mr. Varadarajan, Chair of Panel 1, concluded this session by stating that Mr. Roy raised some valid questions about conflict of interest, something that has been raised in the context of the current nuclear regulatory regime as well and which to a large extent is the reason behind the recent proposal to set up an independent Nuclear Safety Regulatory Authority (NSRA), although the bill has still not been adopted by parliament.²⁶

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24. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, *Gazette of India* No. 40, Part II (26 September 2013), available at: <http://indiacode.nic.in/acts-in-pdf/302013.pdf>.
 25. Mr. Roy provided, as an example, the Report prepared by the Indian Institute of Technology, Delhi, on "Scope, Structure and Processes of National Environment Assessment and Monitoring Authority (NEAMA)" for the MoEF, which concluded, *inter alia*, that: "the presence of MoEF in both the appraisal and approval processes leads to a perception of conflict of interest". "Draft Report: Scope, Structure & Process on NEAMA – Vol. 1, Executive Summary", p. iii, available at: <http://moef.nic.in/downloads/public-information/exec-sum-NEMA.pdf>.
 26. The status of the NSRA Bill, 2011, can be tracked online at the PRS Legislative Research website, available at: www.prsindia.org/billtrack/the-nuclear-safety-regulatory-authority-bill-2011-1980.

Panel Session 2: Values, attitudes and acceptability: experiences from other countries

- Chair: Dr. R.B. Grover, Homi Bhabha Chair Professor, DAE and Director, Homi Bhabha National Institute (HBNI)

Dr. Grover shared opening thoughts in introducing Panel Session 2. First, he noted that a bill has been introduced in Parliament to set up a NSRA as an independent regulator. Since elections have been announced, the bill has lapsed though there is a demand for the next government to respond to the issue improving the independence of the regulatory body.

Second, Dr. Grover stated that Mr. Kamble's observation about energy "need" versus "demand" is valid, but the issue is who decides the reference point for need. One person cannot impose his views on the other person. About a decade ago, the common wisdom was that household electricity demand in India would be less than the household demand in countries having a temperate climate, but the situation today is different. It is relevant in this context to compare India with countries with similar weather conditions (higher demand for air conditioning as opposed to the higher demand for heating in other countries, for example, such as Singapore and Malaysia). In that context, the energy shortage will be acute and must be addressed. Perhaps, gone is the lifestyle of a generation ago where all grew up in a household with just one fan in the main living-room, particularly when comparing it with the urban/middle-class demands for air conditioning units in practically every room of a house or office space. Although India's per capita energy consumption is low, it is bound to increase and this must be addressed.

Third, Dr. Grover reiterated the importance of the research breakthrough announced by Shri Bhardwaj regarding the partitioning of high-level nuclear waste to separate long-lived minor actinides that can be transmuted in a fast reactor by converting it to fuel. India is proud to move forward in this direction, but Dr. Grover also referred to similar experiences in France.

- Erwan Hinault, Chairman and Country Managing Director, AREVA India

To begin Panel Session 2, Mr. Hinault proposed to address four issues based on the experience in France: (1) the choice and support for nuclear energy, (2) the reaction since the Fukushima Daiichi accident, (3) the public engagement model and (4) HLW.

Mr. Hinault began with a history of public support for nuclear energy in France, which dates back to the oil crisis of 1973. Because of the country's severe dependence on oil in the absence of any other significant energy source, energy independence and security became viewed as of paramount importance. Further, the public realised that the price of electricity is cheap, in fact lower than any other European Union country, because of nuclear energy generated within France. Later, in the 1990s, an additional advantage of nuclear energy was the fact that it is a non-CO₂ or greenhouse gas-emitting source, which addresses the public's strongly-held climate change-related concerns. As a result, public support in France has been constant and breaks down along the following lines: (a) 50% pro-nuclear energy, (b) 40% against nuclear energy and (c) 10% without any strong opinions either way.

In the immediate aftermath of the Fukushima Daiichi accident, polls indicated that negative sentiment against nuclear energy increased up to 50%. However, French authorities went out of their way to undertake stress tests at their facilities and share the information with the public. As a result, within a year after the Fukushima Daiichi accident, polls returned to the previous breakdown.

That said, the main concerns of the French public remain: (1) safety and (2) waste management. Like India, France has a closed fuel cycle and plans are taking shape

towards the final waste disposal site. The design work on the “Cigéo” (*Centre industriel de stockage géologique*) facility started in 2011. Although Cigéo will be designed to accommodate the wastes permanently, conditions governing the reversibility of disposal will be determined by law before the repository licence is granted. This reversibility clause also seeks to strengthen public confidence because public concerns will at all times be heard. It is expected that the construction of Cigéo will commence in 2019 and be operational by 2025.

There are many other tools that have been adopted in France to strengthen public dialogue and transparency to maintain the high level of acceptance for this energy choice. For instance, on 13 June 2006, France adopted its law on nuclear transparency and safety.²⁷ This law also established the ASN (*Autorité de sûreté nucléaire*), an independent administrative authority tasked with regulating nuclear safety and radiation protection. The ASN informs the public and other stakeholders (e.g. local information committees, environmental protection associations) about its activities and the state of nuclear safety and radiation protection in France.

Importantly, the local information committees (or “CLIs” as they are known) also received a legal basis under the 2006 Nuclear Transparency and Safety Act,²⁸ though they had been in existence since the early 1980s. The CLIs are an essential link in consultation and transparency at a local level. They are crucial, because at all sites comprising one or more “basic nuclear installations” (INB), a CLI has to be set-up. It is mandatory to set up a CLI once an INB is authorised, even if the INB has not yet been commissioned. CLIs play an important role and:

- can conduct independent epidemiological studies, measurements and analysis;
- must receive from the licensee or the state all necessary information and documents;
- must be informed of any incident or accident;
- is consulted for any project relating to an INB;
- is expected to widely disseminate the results of its work in a form accessible to the greatest number of stakeholders; and
- is responsible for providing any citizen information requested.

As can be seen, CLIs are very active and play a large role in gaining public trust and acting as an effective intermediary between the various government bodies, but also between the operator and the public.

In addition, AREVA has adopted a policy of ensuring that information is shared widely through such avenues as tours of facilities, media briefings, conferences at schools, teaching at universities and engineering schools and regular meetings with mayors and local communities where AREVA sites are located. In response to a question about AREVA’s global outreach policy, Mr. Hinault clarified that from a company perspective, the same approach is adopted worldwide as in France, though the mandatory requirements may differ from country to country.

27. Loi No. 2006-686 du 13 juin 2006 relative à la transparence et à la sécurité en matière nucléaire, *Journal Officiel*, No. 136 (14 June 2006), Text 2, p. 8946.

28. *Ibid.*, Article 22.

- Patrick Reyners, former Head of Legal Affairs, OECD/NEA and IAEA consultant

Mr. Reyners began his remarks by focusing on the various enabling principles and provisions contained in selected international instruments, which emphasise the importance of public consultation, engagement and access to information, all of which ultimately contribute to a higher likelihood of public acceptance of nuclear energy and also to better governance.

Starting with Principle 10 of the Rio Declaration on Environment and Development, which was adopted at the United Nations Conference on Environment and Development in June 1992, Mr. Reyners read the following important quote: “States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided”.²⁹ The 1998 Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (“Aarhus Convention”),³⁰ is the only legally binding international instrument that specifically puts Principle 10 into practice. Although it was adopted within the framework of the United Nations Economic Commission for Europe (UNECE), the Aarhus Convention is open for global accession.

The same is true for the Convention on Environmental Impact Assessment in a Transboundary Context, adopted in Espoo in 1991 (“Espoo Convention”), which sets out the obligations of parties to assess the environmental impact of certain activities at an early stage of planning.³¹ It also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.³² Nuclear power projects fall within the ambit of the Espoo Convention. The Espoo Convention has been supplemented by the 2003 Kiev Protocol on Strategic Environmental Assessment, which requires its parties to evaluate the environmental consequences of their official draft plans and programmes.³³

Further, the 1994 Convention on Nuclear Safety (CNS), to which India is a party, requires in Article 17 on “Siting” that “Each Contracting Party shall take the appropriate steps to ensure that appropriate procedures are established and

29. “Report of the UN Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992”, UN Doc. A/CONF.151/26/Rev. 1, available at: www.un.org/documents/ga/conf151/aconf15126-1annex1.htm.

30. Aarhus Convention (1998), 2161 UNTS 447, available at: http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-13&chapter=27&lang=en. For more on the Aarhus Convention, see United Nations Economic Commission for Europe, web page on “Public Participation”, available at: www.unece.org/env/pp/welcome.html.

31. Espoo Convention (1991), 1989 UNTS 309, available at: http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4&chapter=27&lang=en. For more on the Espoo Convention, see United Nations Economic Commission for Europe, web page on “Introduction to Espoo Convention”, available at: www.unece.org/env/eia/eia.html. See also Rio Declaration Principle 17: “Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.”

32. See also Rio Declaration Principle 19: “States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith”.

33. Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context, available at: www.unece.org/fileadmin/DAM/env/eia/documents/legaltexts/protocolenglish.pdf.

implemented” to undertake a multi-faceted safety evaluation of the proposed nuclear installation and for consultations with, and provision of information to, those in the vicinity of the proposed nuclear installation.³⁴

The 1997 Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (“Joint Convention”), to which India is not party, contains provisions corresponding to those in the CNS with respect to siting.³⁵ However, it is even more far-reaching in its treatment of EIAs. The obligations with respect to the safety of spent fuel and radioactive waste management are largely based on the principles contained in the 1995 IAEA Safety Fundamentals document “The Principles of Radioactive Waste Management”. Importantly, the Joint Convention imposes obligations on contracting parties in relation to the transboundary movement of spent fuel and radioactive waste based on the concepts contained in a 1990 IAEA “Code of Practice on the International Transboundary Movement of Radioactive Waste”.³⁶ Apart from establishing a standard practice of undertaking safety and environmental assessments even before the construction of a radioactive waste management facility or disposal facility, the Joint Convention creates a constructive framework for neighbouring country consultations when undertaking these types of activities. Although historically such agreements have been bilateral (such as between Germany-Switzerland and France-Luxembourg), the Joint Convention seeks to move this practice beyond the bilateral sphere.

There has been ample experience regarding EIAs in domestic legislation as well. For example, the Canadian Environmental Assessment Act, 2012,³⁷ which updated and modernised Canada’s approach, placed the responsibility for conducting an EIA for nuclear projects with the Canadian Nuclear Safety Commission. Similarly, the National Environmental Policy Act (NEPA) of the United States requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions.³⁸ To meet NEPA requirements, federal agencies prepare a detailed statement known as an Environmental Impact Statement (EIS), which the US Environmental Protection Agency (EPA) will review.³⁹

The United Kingdom High Court Judgment of 15 February 2007 showed that public consultation will be taken seriously by many courts. In the judgment, Justice Sullivan agreed with Greenpeace that the review process regarding new generation of nuclear power plants in the United Kingdom did not adequately consult the public as the government had proclaimed and found the review process to be “seriously flawed” and even “manifestly inadequate” because insufficient information had been made available by the government for the consultees to make an intelligent

34. Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, 1963 UNTS 293, available at: www.iaea.org/Publications/Documents/Infcircs/Others/inf449.shtml.

35. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997), IAEA Doc. INFCIRC/546, 2153 UNTS 357, available at: www.iaea.org/Publications/Documents/Infcircs/1997/infirc546.pdf. For more information, see IAEA Nuclear Safety & Security, web page on the Joint Convention, available at: www-ns.iaea.org/conventions/waste-jointconvention.asp.

36. Published as INFCIRC/386 on 13 November 1990, available at: www.iaea.org/Publications/Documents/Infcircs/Others/inf386.shtml.

37. S.C. 2012, c. 19, s. 52. An overview of the Canadian Environmental Assessment Act, 2012, is available at: www.ceaa-acee.gc.ca/default.asp?lang=en&n=16254939-1.

38. National Environmental Policy Act of 1969, 42 USC 4321 et seq.

39. For additional information about NEPA compliance, see US EPA, web page on “National Environmental Policy Act (NEPA)”, available at: www.epa.gov/compliance/nepa/.

response.⁴⁰ As a result, in May 2007, the government launched a major consultation exercise on the future of civil nuclear power in the United Kingdom.⁴¹

Mr. Reyners concluded by echoing Mr. Hinault's observations about the CLIs in France and their important and active part in the public debate about nuclear energy.

- Tyson R. Smith, Partner, Winston & Strawn LLP, United States

Mr. Smith commenced by stating that public trust, acceptance and public involvement in nuclear regulatory decisions are critical to any successful nuclear power programme. In the United States, the US Nuclear Regulatory Commission (NRC) has, over the years, evolved its mechanisms to ensure it takes up its regulatory responsibilities in an open and transparent manner. Transparency is reflected in the regulator's efforts to make the agency's positions known through various mechanisms, including the availability of records, so that a clear nexus can be established between regulatory requirements and its goals. The NRC ensures openness by providing the necessary opportunities for meaningful public input and open channels of communication, so that the reasons behind its decisions can be fully appreciated. Mr. Smith stressed that it is of prime importance that a regulator should not be seen as an "isolated regulator". The NRC engages with the various stakeholders in different manners. For instance, the NRC will make almost all documents available on its website, including, but not limited to policy papers, meeting transcripts, regulatory issue summaries, information notices, inspection manuals, inspection reports, enforcement actions and safety and environmental review documents. The NRC also makes active use of social media such as Twitter, its YouTube channel and the NRC blog to keep the public abreast of developments, meetings and other issues. Moreover, all meetings with the licensee are public, except when addressing security or safeguards related issues. All relevant notifications relating to the NRC's activities and project proposals, phases and studies are announced in the *Federal Register*, which is the daily journal of the US government.

All these efforts have clearly led to increased public confidence, as there is less scope for misinformation. In the United States, about 67% of the public tends to be in favour of nuclear energy. Interestingly, just as in the French context, about one year after the Fukushima Daiichi nuclear power plant accident, this favourable public perception was at about the same percentage. What has been noticed over the years, and which is similar to Mr. Mishra's observation in the context of uranium mining in India, is that the acceptability and support levels for nuclear energy are actually highest in the areas immediately around nuclear facilities, where the direct benefits seem to be most tangible and knowledge of nuclear power greatest, and this holds true for areas where new build projects are sited. Mr. Smith added that the regulator did extensively reach out to the public after the Fukushima Daiichi accident. For instance, the NRC held about 150 meetings in Washington, DC and areas around nuclear power plants to share information with the public. Moreover, it held about seven public meetings per month in areas where new build projects were underway. Mr. Smith did comment that these meetings are not widely attended, but it seems to

40. R. (Greenpeace Ltd) v. Secretary of State for Trade and Industry, [2007] All E.R. (D) 192 [H.C. (Admin)].

41. See Department of Energy and Climate Change, Office for Nuclear Development, "Evaluation of BERR's engagement of the public and other interested parties in the future of civil nuclear power in the UK, Final report", October 2009, available at: http://webarchive.nationalarchives.gov.uk/20121205174605/http://decc.gov.uk/assets/dec_c/what%20we%20do/uk%20energy%20supply/energy%20mix/nuclear/consultations/1_20091008115759_e_@@_nuclearevaluationreport.pdf.

make a difference to the public that they know that they could attend such meetings, if interested.

Mr. Smith further stated that the NRC has established a number of different methods for stakeholders and other members of the public to participate directly in its regulatory and licensing activities. In 1989, the NRC went through a major regulatory overhaul to increase regulatory efficiency by adopting three new regulatory approval approaches for new reactors: (1) standard design certifications, (2) early site permits (ESP) and (3) combined licenses (COL). Design certifications are highly technical in nature; public participation consists primarily of an opportunity to comment on the proposed rule to approve the design. However, there are a number of opportunities for public participation in the review of an ESP or COL application, especially the NEPA process. With regard to environmental issues, the NRC will conduct a public “scoping” meeting in the vicinity of the proposed project shortly after the application is filed. During the scoping meeting, members of the public can raise issues which it feels should be taken into account during the NRC’s environmental review. For a typical new reactor licence application, the NRC receives between 50-100 scoping comments. Thereafter, the NRC issues a Draft Environmental Impact Statement (DEIS) for comment by the appropriate federal, state and local agencies, as well as the public. At that time, the NRC will hold another public meeting in the vicinity of the proposed plant inviting comments on the DEIS. Only afterwards will the NRC issue a Final Environmental Impact Statement (FEIS), which will address all comments submitted by the public.

The Atomic Energy Act of 1954⁴² also provides a more formal hearing process for a person, or a group of people, who is “directly affected” to raise specific technical or environmental concerns emanating from the licence application for an ESP or COL. This hearing process is more “legalistic” in that it requires a higher threshold to be met as the public must present concrete evidence and testimony by experts on the issues it raises as part of this hearing process. These “contentions” raised by the “intervenor” will be evaluated by administrative law judges from the Atomic Safety and Licensing Board (ASLB). The ASLB will scrutinise whether a proposed contention is: (1) specific, (2) adequately supported and (3) material to the licensing proceedings. If so, a hearing will be held. Hence, the decision to grant a request for hearing by a member of the public permits active participation by public stakeholders in the agency decision-making process. The ASLB ultimately issues a written decision evaluating the sufficiency of the application and supporting material provided by the applicant. The ASLB’s decision must be based on the evidence and testimony in the record of the proceeding. Decisions of the ASLB can be appealed to the Commission, and Commission decisions can be appealed directly to the US Courts of Appeals. Moreover, in addition to hearings on issues raised by intervenors (i.e., “contested” hearings), the Atomic Energy Act requires that a public hearing be held before a COL is issued. At this mandatory or “uncontested” hearing, the ASLB or the Commission reviews the adequacy or sufficiency of the NRC Staff’s review of the application.

While reflecting on the various outreach activities undertaken by the NRC, as well as the public comment opportunities, and the more formal hearing process that can be granted to a person with the necessary standing, and taking into account the high level of public support in the US for nuclear energy, Mr. Smith concluded that there is a clear link between public involvement and public acceptance of nuclear energy. He recognised that it may not be possible to achieve universal

42. The Atomic Energy Act of 1954, as amended, 42 USC 2011 et seq., along with other key US legislation pertaining to the nuclear sector, is available at: www.nrc.gov/about-nrc/governing-laws.html#aea-1954.

understanding of regulatory decision making regarding nuclear power, much less universal acceptance of the decision itself. But, he thought that striving to help stakeholders become aware of and understand agency decisions regarding nuclear power would build public acceptance of the regulatory process and nuclear power in general.

Following his presentation, Mr. Smith was asked for his opinion about whether the United States is considering the option of reprocessing of spent fuel. Mr. Smith stated that in his view, for the foreseeable future, given the overarching economic considerations, the option of reprocessing spent fuel will not be taken up by the US government on a priority basis.

Question and Answer Session

At the conclusion of Panel 2, Ambassador Sood asked the panel why within Europe there is such a different public reaction towards nuclear energy (comparing, for example, France and Germany), given that the mere low tariffs on electricity from nuclear energy do not appear to be sufficient to convince the majority of people in Germany. In response, the panel acknowledged that France had taken a very strong and consistent position towards nuclear energy in reaction to the 1973 oil crisis after which it stressed that its energy independence as a nation was of prime importance.⁴³ The historical and political situation in Germany, with its coalition governments and Green Party, has been less uniform vis-à-vis nuclear energy and driven by different concerns.⁴⁴ Interestingly, France has 58 nuclear power plants, whereas Germany at the time of its phase-out decision had 17 operating reactors.

Panel Session 3: Legal framework for a safe and secure nuclear energy programme

- Chair: Mohit Abraham, Partner, PXV Law Partners

Mr. Abraham, a Partner at PXV Law Partners, chaired Panel Session 3. He stressed the importance of public participation and the difficulties faced in India pertaining to the public consultation process as prescribed under the EIA Notification, 2006.⁴⁵ Such public resistance, livelihood concerns and demands for information are observed throughout India whenever large infrastructure projects are undertaken and are therefore not unique to the nuclear energy sector in India.

Mr. Abraham further set the tone by pointing out that lack of an unambiguous legal framework may be slowing down the progress of the nuclear industry in India. He pointed out that given the divergent views about nuclear projects and principles of liability, a convergence must take place on terms that are not only acceptable but also clear to all stakeholders, as was earlier pointed out by Ambassador Sood. He further drew attention to the fact that India's Prime Minister, Shri Manmohan Singh, recently rated the signing of the nuclear deal with the US as the best moment of his 10-year term as India's Prime Minister. This clearly shows the determination of the Indian government to find an acceptable solution to the current impasse, given the diplomatic efforts that had been put into bringing India to this very stage. On the

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43. Other interesting historical and cultural arguments are put forward in the article by Palfreman, J., "Why the French Like Nuclear Energy", Frontline, Public Broadcasting Service, available at: www.pbs.org/wgbh/pages/frontline/shows/reaction/readings/french.html, accessed 2 June 2014.
 44. For a viewpoint on cultural and political aspects that could explain Germany's stance on nuclear energy, see, e.g. Hockenos, P. (10 May 2012), "Why Germans Are So Skeptical About Nuclear Energy", World Policy Blog, available at: www.worldpolicy.org/blog/2012/05/10/why-germans-are-so-skeptical-about-nuclear-energy.
 45. Environmental Impact Assessment Notification, 2006, was published in the *Gazette of India*, Extraordinary, pt. II, sec. 3(ii) (14 September 2006) and is available at: <http://envfor.nic.in/legis/eia/so1533.pdf>.

other hand, Mr. Abraham pointed out that one cannot overlook the importance of finding a mechanism where citizens also feel that justice would be meted out in the event of such worse case scenarios. Recent class action law suits brought before both the courts in Japan,⁴⁶ as well as in New York,⁴⁷ highlight the need to adopt a fair approach.

▪ S. Harikumar, Operating Plants Safety Division, AERB

Mr. Harikumar, the introductory speaker in Panel 3, started by providing an overview of the existing legal framework and the rules and regulation that provide legal authority to the AERB to issue safety codes and standards. He pointed out that the AERB is a regulatory body consisting mainly of scientific and technical professionals. It has a well-established process for developing and issuing regulatory requirements as safety codes and standards.

Mr. Harikumar informed the audience that the safety requirements for nuclear power plants are based on the principle of defence-in-depth, by which the approach is to provide multiple levels of protection, both physical and organisational. Another key feature in the regulatory requirements is the role of operating experience, by which the safety requirements are reviewed and revised based on the experience available from the field, both nationally and internationally, on the incidents at nuclear installations and the current state of the art in the field of nuclear safety and technology.

In India, it is a key feature of the regulatory practice for nuclear power plants to undergo a periodic review every five years and a renewal of the operating licence, unlike the one-time licensing approach followed by many countries. This Periodic Safety Review (PSR) assesses plants against the current safety requirements and practices, rather than against the ones under which the plant was originally licensed. Following this approach, a number of safety upgrades have been implemented in the Indian nuclear power plants, particularly in the older facilities.

Indian nuclear power plants must also maintain emergency preparedness and response plans, including for the off-site domain, to protect people from unacceptable radiation exposure, in the unlikely event of an accident. Further, all operating nuclear power plants are required to conduct off-site emergency exercises every two years.

The Fukushima Daiichi accident was a watershed event. It has changed some of the assumptions that were governing the nuclear power plant safety requirements previously and consequently the safety expectations worldwide. The thrust earlier was on protection against events that were internal to the plant. The Fukushima Daiichi accident has shown that the external initiators can have a devastating impact on the safety of nuclear power plants and the protection against events caused by external factors needs to be assured as much as against internal events. The accident has also shown that multi-unit accidents can occur and that there should be provisions for managing such situations. Moreover there is a new expectation that even in case of a severe accident in a nuclear power plant(s), it should not cause long-term evacuation or resettlement of people from the vicinity of the plants. These changes in the safety expectations are governing the review and revision of safety requirements for nuclear power plants by most of the nuclear

46. See, e.g. Pamintuan-Lamorena, M. (13 March 2014), "Thousands More Join Lawsuit Against Nuclear Suppliers of Fukushima", *Japan Daily Press*, available at: <http://japandailynews.com/thousands-more-join-lawsuit-against-nuclear-suppliers-of-fukushima-1345731/>.

47. Warmerdam, E. (12 March 2014), "If Successful, Fukushima Could Wipe Out GE", *Courthouse News Service*, available at: www.courthousenews.com/2014/03/12/66052.htm.

safety regulators internationally. The revision of safety requirements being considered by AERB will address these new expectations.

In response to a question regarding the role the AERB in the event of a nuclear disaster, Mr. Harikumar clarified that the AERB has a very limited role to play in the event of an accident and that its role would not extend to determination of fault for the purpose of liability.

Mr. Harikumar asserted that the Indian regulatory board has the right mix of technical competence, resources and practical experience to effectively discharge its functions as the regulator. In this connection he pointed out that AERB has initiated the process for an international peer review of its regulatory process by the IAEA, which will be taken up in the near future.

- Evelyne Ameye, Of Counsel, Gomez-Acebo and Pombo Abogados SLP, Spain

Ms. Ameye started by providing a flavour of the existing international legal framework in the field of nuclear liability. She suggested that nuclear law tends to be an exception to regular tort law due to initial fears stemming from the use of nuclear weapons, as well as of catastrophic accidents. But, Ms. Ameye believes that nuclear energy law should be “demystified” and that such an exception is no longer justified 60 years after the nuclear power sector first started emerging as an industry. Producing energy in nuclear power plants is commonplace and backed by multinational (re-)insurance corporations.

A key exception provided by nuclear law to regular tort law is that only the operator can be held legally liable by victims of an accident. Thus, there can be no civil suits initiated against any other party, such as suppliers, designers, constructors, or transporters. This is called “legal channelling”. She mentioned that although legal channelling is broadly accepted by the international nuclear liability conventions and most of the countries, there are some countries that have deviated from this international principle in their national interest, like India and the United States, which operate under an “economic channelling” regime. Thus, in both the United States and India, suppliers and designers of defective reactors can be held legally liable in the event of a nuclear accident, but the economic consequences of a nuclear accident still channel to the liable nuclear operator.

Ms. Ameye noted that the principle of exclusive operator liability emerged for economic reasons because US companies supplying nuclear technology and expertise to Europe’s emerging nuclear businesses in the early 60s wanted to ensure that “hold harmless” clauses were inserted in their agreements, so that they would not bear any liability for their exports and would not face claims by potential victims or operators in Europe. A similar approach was later adopted by Western European companies when exporting nuclear material to Eastern European countries after the fall of the Berlin Wall in 1989: Western European manufacturers, which had just witnessed the gap in the liability regime reflected by the Chernobyl accident in 1986, required the former Soviet bloc countries to adhere to the 1963 Vienna Convention on Civil Liability for Nuclear Damage and, hence, introduce legal channelling in their domestic laws. However, Ms. Ameye is of the opinion that such a principle need not continue unless it is proved to be more beneficial for the victims of an accident. Allowing a right of recourse towards suppliers and designers still allows for a one-stop shop for the victims, who can limit their action to suing the operator. Moreover, it allows the operator to turn to more pockets and sue nuclear equipment suppliers and designers, typically huge multinational corporations with a solid financial structure, possibly reducing his own risk of going bankrupt. For an operator, with its own limited means, it would be very important to be able to seek indemnification from such a large supplier for the money it has paid to the victims. Thus, both Indian and US law, in Ms. Ameye’s view, are better-suited to protect victims in case of a nuclear accident.

Also, reflecting back on the major nuclear accidents at the Three Mile Island, Chernobyl and Fukushima Daiichi nuclear power plants, there were in each instance design-related concerns as well, or at least instances in which the suppliers failed to sufficiently train or inform the operator's staff on the usage and design of some of its equipment. Therefore, Ms. Ameye pointed out that making suppliers, including designers, subject to liability rules makes all the more sense now because the operation of the new nuclear power plant technologies – Generation III and Generation IV installations – are even more design-centred and fully rely upon a correct understanding of their complex design features.

In the context of Indian law, Ms. Ameye was of the view that the United States is perhaps bringing diplomatic pressure on India to sign the 1997 Convention on Supplementary Compensation for Nuclear Damage (CSC), while taking the benefit of the grandfather provision in the CSC. For her, this represents something of a paradox, as the United States in its nuclear trade approaches insists that other countries strictly adhere to the legal channelling principle, whereas the United States itself has not adopted such a model either domestically (its economic channelling allows a right of recourse by the operator) nor when dealing with the outside world (the United States asked for an exception to the legal channelling provisions under the CSC by means of the grandfather clause). Hence, the stalemate in which the United States and India find each other currently is not entirely logical in Ms. Ameye's view, given that both countries have in effect domestically adopted similar approaches, where at least suppliers and designers are not completely shielded from liability. They have more in common than what would meet the eye, and their respective domestic approaches in fact are a "gateway to justice" for the victims and could actually herald a new era in the nuclear legal field.

She also referred to the results of European Union-wide stakeholder consultations regarding public perceptions on the nuclear liability regimes as they currently stand and which were shared by the European Commission in a conference in Brussels in January 2014.⁴⁸ Out of 147 stakeholders, more than 50 were in favour of the idea to suppress legal channelling and enable economic channelling instead. These stakeholders were mostly citizens, whereas the more than 60 in favour of maintaining legal channelling were mainly operators, public authorities and insurers. Ms. Ameye was asked whether in her opinion there is a single-window compensation model or multiple-window compensation model emerging, especially in light of the Fukushima Daiichi accident. Ms. Ameye stated that given that harmonisation has proved to be extremely difficult at the EU level, where a possible legislative action has been pending for several years, she doubts that any single-window or "one-stop shop" could be achieved in the short run at world-wide level.

- Aishwarya Saxena, SNDT Women's University Law School, Mumbai, law student

Ms. Saxena focused her remarks on India's Civil Liability for Nuclear Damage Act (CLND Act) and opened by referring to Section 8 of the CLND Act, which mandates the operator to take out an insurance policy or other financial security to cover the amount of liability set out in the CLND Act.⁴⁹ Since no nuclear liability insurance product is currently available in India, the operator is currently left to rely on a bank guarantee, which blocks his assets and the contingent liability thereunder is

48. For further information on the stakeholder consultations, see European Commission, web page on "Nuclear energy: Public consultation", available at: http://ec.europa.eu/energy/nuclear/consultations/20130718_powerplants_en.htm.

49. Civil Liability for Nuclear Damage Act, No. 38 of 2010, 47 *Gazette of India*, pt. II, sec. 1 (New Delhi, 21 September 2010), available at: www.prindia.org/uploads/media/Nuclear%20Rules/The%20Civil%20Liability%20for%20Nuclear%20Damage%20Act.pdf.

ultimately a charge thereon. The supplier too, though not under a legal obligation, understandably seeks to cover its risk resulting from the unusual right of recourse enforceable by the operator for which again no insurance product is available anywhere in the world.

Ms. Saxena's major concern about the reliance on bank guarantees by NPCIL is that if a bank guarantee is invoked, NPCIL will ultimately still have to repay the full amount to the bank from its own account. In that sense, Ms. Saxena argued, a bank guarantee is not truly a payment security in a situation where NPCIL does not have funds in the first place to meet its liability. Contrast this with an insurance structure whereby an operator pays premiums at regular intervals, but in the event of a nuclear incident the insurance company would pay the entire compensation amount with no further payments by the operator, NPCIL, to the insurance company.

Ms. Saxena, while referring to Sections 4(3) and 6 of the CLND Act, further clarified that operator liability is capped at INR 15 billion (Indian rupee) for each nuclear installation, not all installations combined. Section 4(3) clearly states that "where several nuclear installations of one and the same operator are involved in a nuclear incident, such operator shall, in respect of each such nuclear installation be liable to the extent of liability specified under sub-section (2) of Section 6".⁵⁰ India currently operates seven nuclear installations.⁵¹ This means, a seven-fold multiple of INR 15 billion. Therefore, Ms. Saxena stressed that only insurance for nuclear power utilities could provide a credible payment security mechanism in case of nuclear disaster. She suggested that Indian insurance companies could consider a "floater policy"⁵² to effectively insure nuclear plants. A floater policy that covers all installations seems to be a feasible option for NPCIL at this moment.

Moreover, Ms. Saxena referred to the fact that the insurance industry the world over has responded to capacity difficulties by the formation of market-wide national pools. There are now 26 such market pools, yet even with these it is still not possible to provide full insurance coverage for all nuclear operators' exposure to risk. Yet, in India, the idea of insuring nuclear power plants is comparatively new and both the nuclear and the insurance industry in India are coming to terms with its options.

Ms. Saxena then turned her attention to the lack of worldwide supplier insurance. Yet, a solution has to be found for suppliers to address their risk exposure based on the right of recourse provision embedded in Section 17(b) of the CLND Act. Therefore, she proposed an omnibus coverage to be created for the operator that also encompasses the suppliers' liability. She suggested that alternatively, the suppliers need to be organised into a single legal entity such as a "consortium of suppliers" with insurable interest to which a single umbrella policy can be issued for

50. *Ibid.*, p. 5. Indian legislation, rules and other materials relating to the nuclear sector are available at: www.nlain.org/resources.

51. This includes Kudankulam NPP in addition to Tarapur Atomic Power Station, Rajasthan Atomic Power Station, Madras Atomic Power Station, Kaiga Generation Station, Narora Atomic Power Station and Kakrapar Atomic Power Station. For details about all plants under operation, see NPCIL, web page on "All Plants", available at: <http://npcil.nic.in/main/AllProjectOperationDisplay.aspx>. For details about all plants under construction, see NPCIL, web page on "Plants Under Construction", available at: <http://npcil.nic.in/main/ProjectConstructionDisplay.aspx>.

52. Floater means that a single sum insured can cover all the installations in a single policy and the sum insured is available for any one installation or to all at one point in case of any eventuality during the terms of the policy. However, the claim should not exceed the amount insured. A floater policy is easier to manage than an individual plan and also financially plausible. New installations can be added in the same policy as and when they are constructed.

the maximum liability of INR 15 billion. This will help narrow the undefined scope of coverage. Also it is true that not all suppliers and sub-contractors have contract values as high as INR 15 billion and therefore, taking a separate policy individually would be uneconomical. The premium paid by this consortium can be internally shared by all the members in the ratio of the value of their respective contracts. Another plausible alternative for the suppliers may be to devise a Mutual Compensation Support System based upon the Japanese Facilitation Act, 1961 as amended in 2011. This may require some out-of-the-box thinking, but is the way forward in her view.

Following her presentation, Patrick Reyners commented that he appreciated Ms. Saxena's novel ideas and suggestions, but that the idea of a consortium between suppliers, or particularly between the supplier, contractor and operator as suggested may be difficult to implement as the interests between all these parties are so divergent. Moreover, the nuclear insurers do not usually cover multiple persons' liabilities.

- Dr. P.B. Rastogi, Director (Impact Assessment and Nuclear Projects), Ministry of Environment and Forests

Dr. P.B. Rastogi started by describing the MoEF procedure for granting approval of nuclear projects, which require a mandatory EIA. Nuclear projects are appraised and evaluated by an Expert Appraisal Committee (EAC) comprised of 13 expert members. An "application" for a nuclear project is submitted by the project proponent to the MoEF. The application contains a Prefeasibility Report along with draft TOR and is placed before the EAC (Nuclear) for consideration for the award of the TOR. The EAC finalises the TOR within 30 days and communicates the decision in the next 30 days for the preparation of a draft EIA and to carry out public consultation, which has to be conducted by the concerned SPCB within 45 days. The final EIA, which incorporates the views of the public consultation, is submitted to the MoEF and is placed before the EAC again for consideration of the proposal for the grant of environmental clearance. Therefore, Dr. Rastogi observed that a minimum of 60 days is required for the award of the TOR and 105 days for the grant of environment clearance per EIA Notification, 2006.

Dr. Rastogi emphasised that every stage of the environmental approval is backed by well-documented literature and actual experience gained in implementation of other nuclear projects. For example, the MoEF stipulates several environmental safeguards that must be followed in their approval of projects. He also said that project proponents are asked to honour commitments made to the public during the consultation process through one of the conditions stipulated in the environment clearance letter. These conditions and safeguards are monitored by several agencies including the Regional Office of the MoEF, the Central Pollution Control Board (CPCB) and the SPCB besides the project proponent and the AERB and the DAE thereafter. Moreover, Dr. Rastogi referred to the discussion earlier in the day as part of the first panel session and reiterated that the preparation of an EIA by the accredited consultants was started by the MoEF as early as in 2009,⁵³ even before the directions issued by the Supreme Court.⁵⁴

Interestingly, Dr. Rastogi pointed out that the MoEF has been very particular that as part of environmental approval, the MoEF requires that a part of the project's revenues are spent on CSR to develop the neighbourhood. As such, the MoEF has

53. MoEF (2009) Accreditation of EIA Consultants by the Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET). Office Memo no. J-11013/77/2004-IA-II (I) dated 2 December, 2009.

54. See *Lafarge Umiam Mining Private Limited v. Union of India & Ors.*, (2011) 7 SCC 338, available at: <http://indiankanoon.org/doc/1725193/>.

been imposing a CSR commitment on the project proponents since 2005, well before the Companies Act, 2013 attracted visibility to the notion of CSR in India.⁵⁵ Following the presentation, Mr. Kamble asked Dr. Rastogi to elaborate upon how the MoEF ensures compliance with its conditions for approval, whether there is a compliance report for the Jaitapur project and if the MoEF has enough competent people to monitor compliance. Dr. Rastogi shared that the MoEF has a defined procedure, and therefore compliance can be checked and monitored. If the public consultation fails, the process has to start *de novo*. Further, if accredited consultants do not perform, they are removed from the roster. Lastly, Dr. Rastogi stated that there is no need to question the competence of the staff at MoEF as they are all extremely qualified in their respective technical fields.

55. The Companies Act, 2013, which replaces the Companies Act, 1956, entered into force on 1 April 2014. Its new section 135 requires that large companies (with certain net worth or net profit thresholds) must set up a CSR Committee and requires that such companies spend in every financial year at least 2% of the average net profits of the company made during the three immediately preceding financial years, in pursuit of its CSR Policy. The Companies Act, 2013 was published in the *Gazette of India*, No. 27, Pt. II (30 August 2013), p. 1, and is available at: <http://indiacode.nic.in/acts-in-pdf/182013.pdf>.

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